EXAMPLES USING THE
DEPARTMENT OF ELECTRICAL ENGINEERING'S
DATA MANAGEMENT SYSTEM

James D. Bruce
Burton J. Smith
11 December 1969

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INTRODUCTION

Approximately three and a half years ago, those of us associated with the administration of the Department of Electrical Engineering began to realize that the use of digital computers could facilitate many of the day-to-day, routine, but nevertheless time-consuming administrative tasks. We began with a rather simple-minded approach, deciding to use two commands -- TYPSET, a text editing program and RUNOFF, a memorandum generator -- available on CTSS to maintain and output a data file containing the teaching and research assignments for all faculty and teaching staff for a particular term. (The commands TYPSET and RUNOFF are described in Section AH.9.01 of the CTSS Programmer's Guide.) A time-shared system was chosen over the conventional batch system because of its interactive capabilities.

With this much data stored on-line one is immediately tempted to do something with it (in addition to being able to edit and output it). So, in the summer of 1966 one of our graduate students wrote a rather complex program called WORK. WORK searched the data file for lines associated with the subjects taught in the department. Upon finding such a line it stored in an internal file the name of the faculty or staff member associated with the line, the per-

centage time associated with the subject, the subject number, and the role played by the faculty or staff member in the subject. This internal file was sorted by subject number and an output file in RUNOFF format was generated.

Having attained this capability and reaching a position where the operational bugs were under control we wanted to try a number of additional things. As we started we rapidly realized that most of the programs we wanted to write had large segments of code in common. We also began to see the need for some programming system by which new data management programs could be written in hours rather than days or months. These observations led in time to SPLP a data management system language. (SPLP is described in Burton J. Smith's master's thesis, A Special-Purpose List Processor, submitted to the Department of Electrical Engineering in June 1968. A users manual with examples relating to the system's use in academic administration is in preparation.)

The SPLP language is imbedded in MAD and consists entirely of subroutines. Our reasons for imbedding were several. First, an imbedded language is easy to write; most of the onerous details are left to the parent compiler. Second, the language is easy to modify; the subroutines may be individually compiled, and new features

may be easily added to the language either by introducing new subroutines or modifying old ones. Third, the combination of the parent language and the imbedded language is usually much more powerful than either language alone.

As the language grew, so did our concepts of the data file. We rapidly went from a file containing only teaching personnel of the department and their assignments for one particular term to a file containing almost all departmental employees (soon all will be in the file) and their assignments and detailed salary distributions for several terms.

From this point we see many changes and additions we want to make. We see the necessity to move from CTSS (the system tentatively disappears January 1, 1971) to another system -- a new system for MULTICS is being developed. We see the need for greater protection (privacy) of the data files and will implement such protection mechanisms in the MULTICS system.

In the following sections of this report we attempt to illustrate the format that our Master Data File takes, the programs that we have developed, the results of executing these programs on the Master Data File, and some features of the SPLP language.

AN EXAMPLE OF A MASTER DATA FILE

On pages 5 through 8 we present a printout of a Master Data File such as might be associated with a small academic department. This department has staff in four ranks: Professor, Associate Professor, Teaching Assistant, and Research Assistant. Assignments are given for two years and indicate the flexibility of this data management system. A printout such as this is a working document -- you will note a number of hand-written changes and new entries. These changes and entries are edited into the file on a regular basis.

Memorandum 2596
1 October 1969

Massachusetts Institute of Technology

DEPARTMENT OF ELECTRICAL ENGINEERING

Master Teaching and Research Assignments

****

PART I

PROFESSORS

Sawyer, H. J. 9-101 X-9001
ACADEMIC YEAR 1968-69
Head, Department of Electrical Engineering;
Faculty Counselor, Course VI-1, Year 2;
Institute Committee of Space Research;
M. I. T. Press Board;
Department Committee on Graduate Students.
SUMMER SESSION
FIRST TERM
SECOND TERM
ACADEMIC YEAR 1969-70
Head, Department of Electrical Engineering;
Faculty Counselor, Course VI-1, Year 3;
Institute Committee on Information Processing;
Institute Research Advisory Committee;
Department Committee on Graduate Students;
6.10 in-charge.

SUMMER SESSION
FIRST TERM
Teach 6.10 recitation.
SECOND TERM

9-708 1234
George, J. A. ~~9-105~~ X-~~9005~~
ACADEMIC YEAR 1968-69
6.11 in-charge;
SUMMER SESSION
10% GEN 14642: Graduate Counselor;
90% DSR 80075; June 16, 1968 to August 16, 1968.
FIRST TERM
10% GEN 14642: Graduate Counselor;
10% GEN 14643: Department Undergraduate Educational Policy Committee;
40% GEN 14641: teach 6.11 recitation;
40% DSR 80075.
SECOND TERM
10% GEN 14642: Graduate Counselor;
30% GEN 14642: teach 6.51 laboratory;
60% DSR 80076.
ACADEMIC YEAR 1969-70
6.11 in-charge;
6.51 in-charge;
SUMMER SESSION
%
FIRST TERM
10% GEN 14641: Faculty Counselor, Course VI-1, Year 2;
30 ~~40%~~ FUND 38505: 6.51 development;
60 ~~50%~~ DSR 80076.
SECOND TERM
100% FUND 32456: Sabbatical Leave.

Nance, D. J. 9-206 X-9206
ACADEMIC YEAR 1969-70
6.14 in-charge;
SUMMER SESSION
100% DSR 81195; July 16, 1969 to September 15, 1969.
FIRST TERM
10% GEN 14641: Faculty Counselor, Course VI-1, Year 4;
40% FUND 31463: teach 6.51 laboratory;
30% FUND 38505: 6.14 development;
20% DSR 81195.
SECOND TERM

10% GEN 14641: Faculty Counselor, Course VI-1, Year 4;
30 ~~40~~% FUND 31463: teach 6.11 recitation;
50% DSR 81195.

10% GEN 14642: Graduate Counselor;

ASSOCIATE PROFESSORS

Camp, G. H. 9-165 X-9065
ACADEMIC YEAR 1968-69
6.12 in-charge;
6.15 in-charge;
SUMMER SESSION
10% GEN 14643: Chairman, Department Committee on Graduate Admissions;
10% GEN 14644: Institute Committee on Graduate Students;
10% GEN 14642: Graduate Counselor;
70% DSR 80050; June 16, 1968 to July 15, 1968.
FIRST TERM
8
Leave of absence.
SECOND TERM
10% GEN 14643: Chairman, Department Committee on Graduate Admissions;
10% GEN 14644: Institute Committee on Graduate Students;
10% GEN 14642: Graduate Counselor;
40% GEN 14641: teach 6.12 recitation;
30% DSR 80050.
ACADEMIC YEAR 1969-70
6.12 in-charge;
6.15 in-charge;
SUMMER SESSION
10% GEN 14643: Chairman, Department Committee on Graduate Admissions;
10% GEN 14642: Graduate Counselor;
80% FUND 32409; June 16, 1969 to July 15, 1969 and August 16, 1969 to September 15, 1969.
FIRST TERM
10% GEN 14643: Chairman, Department Committee on Graduate Admissions;
40% GEN 14641: teach 6.12 recitation;
50% DSR 80050.
SECOND TERM
25% GEN 14643: Chairman, Department Committee on Graduate Admissions;
40% GEN 14642: teach 6.15 recitation;
35% DSR 80050.

TEACHING ASSISTANTS

Black, R. D. 9-305 X-9503 117-36-4095
ACADEMIC YEAR 1968-69
FIRST TERM
50% GEN 14641: assist Professor George with 6.11 problem grading;
50% GEN 14642: assist Professor Camp with 6.15 laboratory.
SECOND TERM
50% GEN 14641: teach 6.11 recitation;
50% GEN 14641: assist with 6.11 problem grading.
ACADEMIC YEAR 1969-70
SUMMER SESSION
100% GEN 14641: teach 6.15 laboratory.

Booker, A.B. 9-306 X-1239 323-62-0509
A___ Y___ 1969-70
S___ T___
100% GEN 14691: assist Prof___ Nance with 6.11 tutorials.

Lewis, V. E. 9-305 X-9503 123-65-4277
ACADEMIC YEAR 1969-70
FIRST TERM
100% GEN 14641: assist Professor Nance with 6.11 tutorials.
~~SECOND TERM~~
~~100% GEN 14642: teach 6.51 seminar.~~

RESEARCH ASSISTANTS

Bromfeld, E. 9-306 X-9306 576-42-1195
ACADEMIC YEAR 1968-69
SUMMER SESSION
100% DSR 81196 (Professor Sawyer); June 16, 1968 to September 15, 1968.
FIRST TERM
100% DSR 81197 (Professor Sawyer); September 16, 1969 to January 31, 1969.
SECOND TERM
100% DSR 81197 (Professor Sawyer); February 1, 1969 to June 15, 1969.
ACADEMIC YEAR 1969-70
FIRST TERM
Assist Professor Sawyer with 6.10 problem grading;
50% FUND 41708;
50% DSR 81197 (Professor Sawyer); September 16, 1969 to January 31, 1970.
SECOND TERM
100% DSR ~~81197~~ (Professor ~~Sawyer~~); February 1, 1970 to ~~May 30,~~ 1970.

89118 George June 15

THE FILE STRUCTURE

Before one can edit the file he must know two things -- the structure of the file and how to use the editor TYPSET. In order to illustrate the file structure, we have included on pages 10 through 15 a complete listing of the Master Data File. You will note interspersed with the text a number of lines beginning with a period. These lines act either as commands that control the format of the output when RUNOFF is used or as flags for the various SPLP programs. Specifically, ".na" is a flag indicating the beginning of a name block, ".en" indicates the end of a name block, and ".$" indicates the salary line for a particular term. A description of the RUNOFF commands as well as the TYPSET editor are found in Section AH.9.01 of the CTSS Programmer's Guide.

```
.nojust
.nofill
.line length 65
```

Memorandum 2596
1 October 1969

```
.sp 6
.ce
Massachusetts Institute of Technology
.sp 2
.ce
DEPARTMENT OF ELECTRICAL ENGINEERING
.sp 2
.ce
Master Teaching and Research Assignments
.sp 4
.header MASTER TEACHING AND RESEARCH ASSIGNMENTS
.paging mode margin
**********************************************************************
.sp 2
.ce
PART I
.sp 4
.indent 6
.undent 6
PROFESSORS
.sp 2
.na
.undent 6
Sawyer, H. J.       9-101          X-9001
.br
.undent 4
ACADEMIC YEAR 1968-69
.br
Head, Department of Electrical Engineering;
Faculty Counselor, Course VI-1, Year 2;
Institute Committee of Space Research;
M. I. T. Press Board;
Department Committee on Graduate Students.
.undent 2
SUMMER SESSION
.$ NQ+000001
.br
.undent 2
FIRST TERM
.$ NQ+000001
.br
.undent 2
SECOND TERM
.$ NQ+000001
.br
.undent 4
ACADEMIC YEAR 1969-70
.br
Head, Department of Electrical Engineering;
Faculty Counselor, Course VI-1, Year 3;
```

```
Institute Committee on Information Processing;
Institute Research Advisory Committee;
Department Committee on Graduate Students;
6.10 in-charge.
.undent 2
SUMMER SESSION
.$ MQ+000001
.br
.undent 2
FIRST TERM
.$ MQ+000001
.br
Teach 6.10 recitation.
.undent 2
SECOND TERM
.$ MQ+000001
.br
.en
.sp 6
.na
.undent 6
George, J. A.        9-708          X-1234
.br
.undent 4
ACADEMIC YEAR 1968-69
.br
6.11 in-charge;
.undent 2
SUMMER SESSION
.$ MOGM7)000003
.br
10% GEN 14642: Graduate Counselor;
90% DSR 80075; June 16, 1968 to August 16, 1968.
.undent 2
FIRST TERM
.$ ROGM7)000003
.br
10% GEN 14642: Graduate Counselor;
10% GEN 14643: Department Undergraduate Educational Policy Committee;
40% GEN 14641: teach 6.11 recitation;
40% DSR 80075.
.undent 2
SECOND TERM
.$ ROGM7)000003
.br
10% GEN 14642: Graduate Counselor;
30% GEN 14642: teach 6.51 laboratory;
60% DSR 80076.
.undent 4
ACADEMIC YEAR 1969-70
.br
6.11 in-charge;
6.51 in-charge;
.undent 2
SUMMER SESSION
```

```
.$ M7)000002
.br
&
.undent 2
FIRST TERM
.$ JOGMQ)000003
.br
10% GEN 14641: Faculty Counselor, Course VI-1, Year 2;
30% FUND 38505: 6.51 development;
60% DSR 80076.
.undent 2
SECOND TERM
.$ JOGMQ)000003
.br
100% FUND 32456: Sabbatical Leave.
.en
.sp 6
.na
.undent 6
Nance, D. J.          9-206          X-9206
.br
.undent 4
ACADEMIC YEAR 1969-70
.br
6.14 in-charge;
.undent 2
SUMMER SESSION
.$ M09Y000004
.br
100% DSR 81195; July 16, 1969 to September 15, 1969.
.undent 2
FIRST TERM
.$ .IPP4000005
.br
10% GEN 14641: Faculty Counselor, Course VI-1, Year 4;
40% FUND 31463: teach 6.51 laboratory;
30% FUND 38505: 6.14 development;
20% DSR 81195.
.undent 2
SECOND TERM
.$ .IPP4000005
.br
10% GEN 14641: Faculty Counselor, Course VI-1, Year 4;
10% GEN 14642: Graduate Counselor;
30% FUND 31463: teach 6.11 recitation;
50% DSR 81195.
.en
.sp 6
.undent 6
ASSOCIATE PROFESSORS
.sp 2
.na
.undent 6
Camp, G. H.           9-165          X-9065
.br
```

```
.undent 4
ACADEMIC YEAR 1968-69
.br
6.12 in-charge;
6.15 in-charge;
.undent 2
SUMMER SESSION
.$ **MP4000005
.br
10% GEN 14643: Chairman, Department Committee on Graduate Admissions;
10% GEN 14644: Institute Committee on Graduate Students;
10% GEN 14642: Graduate Counselor;
70% DSR 80050; June 16, 1968 to July 15, 1968.
.undent 2
FIRST TERM
.$ D)PP4000005
.br
%
Leave of absence.
.undent 2
SECOND TERM
.$ D)PP4000005
.br
10% GEN 14643: Chairman, Department Committee on Graduate Admissions;
10% GEN 14644: Institute Committee on Graduate Students;
10% GEN 14642: Graduate Counselor;
40% GEN 14641: teach 6.12 recitation;
30% DSR 80050.
.undent 4
ACADEMIC YEAR 1969-70
.br
6.12 in-charge;
6.15 in-charge;
.undent 2
SUMMER SESSION
.$ 70EW0000006
.br
10% GEN 14643: Chairman, Department Committee on Graduate Admissions;
10% GEN 14642: Graduate Counselor;
80% FUND 32409; June 16, 1969 to July 15, 1969 and August 16, 1969 to September 15, 1969.
.undent 2
FIRST TERM
.$ P
745'000007
.br
10% GEN 14643: Chairman, Department Committee on Graduate Admissions;
40% GEN 14641: teach 6.12 recitation;
50% DSR 80050.
.undent 2
SECOND TERM
.$ P
745'000007
.br
25% GEN 14643: Chairman, Department Committee on Graduate Admissions;
40% GEN 14642: teach 6.15 recitation;
35% DSR 80050.
.en
```

```
.sp 6
.undent 6
TEACHING ASSISTANTS
.sp 2
.na
.undent 6
Black, R. D.        9-305          X-9503     117-36-4095
.br
.undent 4
ACADEMIC YEAR 1968-69
.br
.undent 2
FIRST TERM
.$ Q015'000007
.br
50% GEN 14641: assist Professor George with 6.11 problem grading;
50% GEN 14642: assist Professor Camp with 6.15 laboratory.
.undent 2
SECOND TERM
.$ Q015'000007
.br
50% GEN 14641: teach 6.11 recitation;
50% GEN 14641: assist with 6.11 problem grading.
.undent 4
ACADEMIC YEAR 1969-70
.br
.undent 2
SUMMER SESSION
.$ FIB2Q000008
.br
100% GEN 14641: teach 6.15 laboratory.
.en
.sp 6
.na
.undent 6
Booker, A. B.       9-306          X-1234     323-62-0504
.br
.undent 4
ACADEMIC YEAR 1969-70
.br
.undent 2
SECOND TERM
.$        4HBWU000009
.br
100% GEN 14641: assist Professor Nance with 6.11 tutorials.
.en
.sp 6
.na
.undent 6
Lewis, V. E.        9-305          X-9503     123-65-4277
.br
.undent 4
ACADEMIC YEAR 1969-70
.br
.undent 2
```

FIRST TERM
.$ 4HBWU000009
.br
100% GEN 14641: assist Professor Nance with 6.11 tutorials.
.en
.sp 6
.undent 6
RESEARCH ASSISTANTS
.sp 2
.na
.undent 6
Bromfeld, E. 9-306 X-9306 576-42-1195
.br
.undent 4
ACADEMIC YEAR 1968-69
.br
.undent 2
SUMMER SESSION
.$ F:I2Q000008
.br
100% DSR 81196 (Professor Sawyer); June 16, 1968 to September 15, 1968.
.undent 2
FIRST TERM
.$ Z0)+W0000009
.br
100% DSR 81197 (Professor Sawyer); September 16, 1969 to January 31, 1969.
.undent 2
SECOND TERM
.$ Z0)WU000009
.br
100% DSR 81197 (Professor Sawyer); February 1, 1969 to June 15, 1969.
.undent 4
ACADEMIC YEAR 1969-70
.br
.undent 2
FIRST TERM
.$ RES=(000011
.br
Assist Professor Sawyer with 6.10 problem grading;
50% FUND 41708;
50% DSR 81197 (Professor Sawyer); September 16, 1969 to January 31, 1970.
.undent 2
SECOND TERM
.$ RES=(000011
.br
100% DSR 89118 (Professor George); February 1, 1970 to June 15, 1970.
.en

EDITING THE MASTER DATA FILE

The following three pages indicate the actual "conversation" between the user and the computer when editing the changes and new entries shown on pages 5 through 8 into the Master Data File. In this example, the users' requests are in the standard type face while the computer's response is in italics.

Referencing page 5 we note that the first change to be made is to the office and telephone extension for Professor George. To do this we first "typset sample" (sample is the name of the Master Data File). After the computer has responded with "Edit" the user types "f George" where "f" is shorthand for find. Once the computer responds we type "c /103/708/" which will change the first occurrance of "103" in the line to "708". We continue in this manner until all the entries and changes have been made. Then we execute the command "file" which stores the new file with the changes and erases the older copy of the file. Since sample is kept in a protected mode to prevent unauthorized modification or accidental erasure the system queries the user to verify that the user indeed wishes to delete the file and replace it with the new version. A "yes" response accomplishes this. (If the user had responded with "no" a new file name would be requested.)

typset sample

W 1426.8

Edit

f George

George, J. A. *9-103* *X-9005*

c /103/708/

George, J. A. *9-708* *X-9005*

c /9005/1234/

George, J. A. *9-708* *X-1234*

l 69-7

ACADEMIC YEAR 1969-70

f 4

40% FUND 38505: 6.51 development;

c /4/3/

30% FUND 38505: 6.51 development;

n

c /5/6/

60% DSR 80076.

l 69-70

ACADEMIC YEAR 1969-70

f SEC

SECOND TERM

f 1

10% GEN 14641: Faculty Counselor, Course VI-1, Year 4;

i 10% GEN 14642: Graduate Counselor;

```
n
c /4/3/
30% FUND 31463: teach 6.11 recitation;
f Black
Black, R. D.          9-305          X-9503     117-36-4095
f .undent 6
.undent 6
i Booker, A. B.       9-306          X-1234     323-62-0504
i .br
i .undent 4
i ACADEMIC YEAR 1969-70
i .br
i .undent 2
i SECOND TERM
i .br
i 100% GEN 14641: assist Professor Nance with 6.11 tutorials.
i .en
i .sp 6
i .na
i .undent 6
f 1
100% GEN 14641: assist Professor Nance with 6.11 tutorials.
n
p
.undent 2
d 3
n
p
```

```
.br
d
n
p
100% GEN 14642: teach 6.51 seminar.
d
n
p
.en


l 69-70
ACADEMIC YEAR 1969-70
f 1
100% DSR 81197 (Professor Sawyer); February 1, 1970 to May 30, 1970.
r 100% DSR 89118 (Professor George); February 1, 1970 to June 15, 1970.
file
Old file SAMPLE(MEMO) is PROTECTED.  --Do you wish to delete it?  yes
*
R 7.083+7.066
```

MASTER DATA FILE AFTER EDITING

The following five pages (pages 21 through 25) were generated by executing the RUNOFF command on the new Master Data File. This copy must be compared to the hand notations made on the older version to insure that all editing has been correct and complete. The new version of the Master Data File is then available for use in generating (by computer) updated administrative documents and is available as a printed document on which to enter new changes in order to repeat the editing cycle.

Memorandum 2596
1 October 1969

Massachusetts Institute of Technology

DEPARTMENT OF ELECTRICAL ENGINEERING

Master Teaching and Research Assignments

****

PART I

PROFESSORS

Sawyer, H. J. 9-101 X-9001
ACADEMIC YEAR 1968-69
Head, Department of Electrical Engineering;
Faculty Counselor, Course VI-1, Year 2;
Institute Committee of Space Research;
M. I. T. Press Board;
Department Committee on Graduate Students.
SUMMER SESSION
FIRST TERM
SECOND TERM
ACADEMIC YEAR 1969-70
Head, Department of Electrical Engineering;
Faculty Counselor, Course VI-1, Year 3;
Institute Committee on Information Processing;
Institute Research Advisory Committee;
Department Committee on Graduate Students;
6.10 in-charge.

SUMMER SESSION
FIRST TERM
Teach 6.10 recitation.
SECOND TERM

George, J. A. 9-708 X-1234
ACADEMIC YEAR 1968-69
6.11 in-charge;
SUMMER SESSION
10% GEN 14642: Graduate Counselor;
90% DSR 80075; June 16, 1968 to August 16, 1968.
FIRST TERM
10% GEN 14642: Graduate Counselor;
10% GEN 14643: Department Undergraduate Educational Policy Committee;
40% GEN 14641: teach 6.11 recitation;
40% DSR 80075.
SECOND TERM
10% GEN 14642: Graduate Counselor;
30% GEN 14642: teach 6.51 laboratory;
60% DSR 80076.
ACADEMIC YEAR 1969-70
6.11 in-charge;
6.51 in-charge;
SUMMER SESSION
%
FIRST TERM
10% GEN 14641: Faculty Counselor, Course VI-1, Year 2;
30% FUND 38505: 6.51 development;
60% DSR 80076.
SECOND TERM
100% FUND 32456: Sabbatical Leave.

Nance, D. J. 9-206 X-9206
ACADEMIC YEAR 1969-70
6.14 in-charge;
SUMMER SESSION
100% DSR 81195; July 16, 1969 to September 15, 1969.
FIRST TERM
10% GEN 14641: Faculty Counselor, Course VI-1, Year 4;
40% FUND 31463: teach 6.51 laboratory;
30% FUND 38505: 6.14 development;
20% DSR 81195.
SECOND TERM

10% GEN 14641: Faculty Counselor, Course VI-1, Year 4;
10% GEN 14642: Graduate Counselor;
30% FUND 31463: teach 6.11 recitation;
50% DSR 81195.

ASSOCIATE PROFESSORS

Camp, G. H. 9-165 X-9065
ACADEMIC YEAR 1968-69
6.12 in-charge;
6.15 in-charge;
SUMMER SESSION
10% GEN 14643: Chairman, Department Committee on Graduate Admissions;
10% GEN 14644: Institute Committee on Graduate Students;
10% GEN 14642: Graduate Counselor;
70% DSR 80050; June 16, 1968 to July 15, 1968.
FIRST TERM
X
Leave of absence.
SECOND TERM
10% GEN 14643: Chairman, Department Committee on Graduate Admissions;
10% GEN 14644: Institute Committee on Graduate Students;
10% GEN 14642: Graduate Counselor;
40% GEN 14641: teach 6.12 recitation;
30% DSR 80050.
ACADEMIC YEAR 1969-70
6.12 in-charge;
6.15 in-charge;
SUMMER SESSION
10% GEN 14643: Chairman, Department Committee on Graduate Admissions;
10% GEN 14642: Graduate Counselor;
80% FUND 32409; June 16, 1969 to July 15, 1969 and August 16, 1969 to September 15, 1969.
FIRST TERM
10% GEN 14643: Chairman, Department Committee on Graduate Admissions;
40% GEN 14641: teach 6.12 recitation;
50% DSR 80050.
SECOND TERM
25% GEN 14643: Chairman, Department Committee on Graduate Admissions;
40% GEN 14642: teach 6.15 recitation;
35% DSR 80050.

TEACHING ASSISTANTS

Black, R. D. 9-305 X-9503 117-36-4095
ACADEMIC YEAR 1968-69
FIRST TERM
50% GEN 14641: assist Professor George with 6.11 problem grading;
50% GEN 14642: assist Professor Camp with 6.15 laboratory.
SECOND TERM
50% GEN 14641: teach 6.11 recitation;
50% GEN 14641: assist with 6.11 problem grading.
ACADEMIC YEAR 1969-70
SUMMER SESSION
100% GEN 14641: teach 6.15 laboratory.

Booker, A. B. 9-306 X-1234 323-62-0504
ACADEMIC YEAR 1969-70
SECOND TERM
100% GEN 14641: assist Professor Nance with 6.11 tutorials.

Lewis, V. E. 9-305 X-9503 123-65-4277
ACADEMIC YEAR 1969-70
FIRST TERM
100% GEN 14641: assist Professor Nance with 6.11 tutorials.

RESEARCH ASSISTANTS

Bromfeld, E. 9-306 X-9306 576-42-1195
ACADEMIC YEAR 1968-69
SUMMER SESSION
100% DSR 81196 (Professor Sawyer); June 16, 1968 to September 15, 1968.
FIRST TERM
100% DSR 81197 (Professor Sawyer); September 16, 1969 to January 31, 1969.
SECOND TERM
100% DSR 81197 (Professor Sawyer); February 1, 1969 to June 15, 1969.
ACADEMIC YEAR 1969-70
FIRST TERM
Assist Professor Sawyer with 6.10 problem grading;
50% FUND 41708;
50% DSR 81197 (Professor Sawyer); September 16, 1969 to January 31, 1970.

SECOND TERM
100% DSR 89118 (Professor George); February 1, 1970 to June 15, 1970.

THE EXECUTION OF OPTIONS ON THE MASTER DATA FILE

Once the Master Data File has been updated, we want to use that data to generate reports which can be used in the day-to-day administration of the department. These reports are generated by executing SPLP programs, called OPTIONS.

OPTION PART1

The option named PART1 takes as its input a Master Data File and generates an output file corresponding to the teaching and research assignments for one particular term. The conversation between the user and the computer required to execute this option is given on page 27.

OPTION PART2

PART2 takes as its input file a file generated by PART1 and generates an output file as follows: The input file is searched for lines containing a subject number. Once a subject line is found, the name associated with the line, the subject number, the percentage, and the role are abstracted and temporarily stored. Once all such entries are found and stored they are sorted and written in an output file. (This option is the SPLP counterpart of WORK -- see page 1.) The user-computer conversation required to execute this option is indicated on page 28 with the command to RUNOFF the results of both OPTION PART1 and OPTION PART2. The actual output is presented as pages 29 through 31.

```
r option part1 sample fal1
W 1523.2
PART1 STARTED.
This report is MEMORANDUM 2596-JDB
This report is to be dated December 11, 1969
This report is PRELIMINARY, REVISED, or FINAL EXAMPLE
This report is for (which period) FIRST TERM 1969-70
TYPE MESSAGE:  FOR DEMONSTRATION PURPOSES ONLY.

DO PART1 FOR
(YEAR) ACADEMIC YEAR 1969-70
(TERM) FIRST TERM
.append  fal2
PART1 FINISHED.
R 9.766+6.133
```

r option part2 fal1 fal2

W 1530.0

PART2 STARTED.

INPUT FINISHED.

SORTING FINISHED.

.append

PART2 FINISHED.

R 9.850+4.850

runoff fal1

W 1530.8

Load paper, hit return

MEMORANDUM 2596-JDB
December 11, 1969

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL ENGINEERING

EXAMPLE TEACHING AND RESEARCH ASSIGNMENTS

FIRST TERM 1969-70

FOR DEMONSTRATION PURPOSES ONLY.

****

PART I

PROFESSORS

Sawyer, H. J. 9-101 X-9001
Head, Department of Electrical Engineering; Faculty Counselor, Course VI-1, Year 3; Institute Committee on Information Processing; Institute Research Advisory Committee; Department Committee on Graduate Students; 6.10 in-charge. Teach 6.10 recitation.

George, J. A. 9-708 X-1234
6.11 in-charge; 6.51 in-charge; 10% GEN 14641: Faculty Counselor, Course VI-1, Year 2; 30% FUND 38505: 6.51 development; 60% DSR 80076.

Nance, D. J. 9-206 X-9206
6.14 in-charge; 10% GEN 14641: Faculty Counselor, Course VI-1, Year 4; 40% FUND 31403: teach 6.51 laboratory; 30% FUND 38505: 6.14 development; 20% DSR 81195.

ASSOCIATE PROFESSORS

Camp, G. H. 9-165 X-9065
6.12 in-charge; 6.15 in-charge; 10% GEN 14643: Chairman, Department Committee on Graduate Admissions; 40% GEN 14641: teach 6.12 recitation; 50% DSR 80050.

TEACHING ASSISTANTS

Lewis, V. E. 9-305 X-9503 123-65-4277
100% GEN 14641: assist Professor Nance with 6.11 tutorials.

RESEARCH ASSISTANTS

Bromfeld, E. 9-306 X-9306 576-42-1195
Assist Professor Sawyer with 6.10 problem grading; 50% FUND 41708; 50% DSR 81197 (Professor Sawyer); September 16, 1969 to January 31, 1970.

PART II

6.10
IN-CHARGE
Sawyer, H. J.

RECITATION
Sawyer, H. J.

PROBLEM GRADING
Bromfeld, E.

6.11
IN-CHARGE
George, J. A.

TUTORIAL
Lewis, V. E. 100%

6.12
IN-CHARGE
Camp, G. H.

RECITATION
Camp, G. H. 40%

6.14
IN-CHARGE
Nance, D. J.

DEVELOPMENT
Nance, D. J. 30%

6.15
IN-CHARGE
Camp, G. H.

6.51
IN-CHARGE
George, J. A.

LABORATORY
Nance, D. J. 40%

DEVELOPMENT
George, J. A. 30%

OPTION DACCA

Another option which the department uses is DACCA. DACCA takes a file generated by PART1, identifies each line associated with an account number, extracts the account number, the percentage charged to that account, and the name associated with that account line. These data are sorted by account number and written in an output file. The command sequence required to execute this option is illustrated on page 33 with the corresponding output on pages 34 and 35.

```
r option dacca fall dacc
W 1533.1
DACCA STARTED.
This report is MEMORANDUM 3636-JDB
This report is to be dated December 11, 1969
This report is PRELIMINARY, REVISED, OR FINAL EXAMPLE
This report is for (which period) FIRST TERM 1969-70
TYPE MESSAGE:  FOR DEMONSTRATION PURPOSES ONLY

INPUT FINISHED.
SORTING FINISHED.
DACCA FINISHED.
R 9.816+5.600



runoff dacc
W 1536.5
Load paper, hit return
```

MEMORANDUM 3636-JDB
December 11, 1969

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL ENGINEERING

EXAMPLE DISTRIBUTION OF FACULTY AND STAFF SALARIES

FIRST TERM 1969-70

FOR DEMONSTRATION PURPOSES ONLY

****

14641	10%	George, J. A.
	10%	Nance, D. J.
	40%	Camp, G. H.
	100%	Lewis, V. E.
14643	10%	Camp, G. H.
31463	40%	Nance, D. J.
38505	30%	George, J. A.
	30%	Nance, D. J.
41708	50%	Bromfeld, E.

80050	50%	Camp, G. H.
80076	60%	George, J. A.
81195	20%	Nance, D. J.
81197	50%	Bromfeld, E.

OPTION DINDI

DINDI takes a file created by PART1 and creates an output file containing only names and information specifying the distribution of that person's salary to various accounts. The command sequence for this option is given on page 37 and the corresponding output on pages 38 and 39.

r option dindi fal1 dind

W 1538.6

DINDI STARTED.

*This report is MEMORANDUM 4021-*JDB

This report is to be dated December 11, 1969

This report is PRELIMINARY, REVISED, or FINAL EXAMPLE

This report is for (which period) FIRST TERM 1969-70

TYPE MESSAGE: FOR DEMONSTRATION PURPOSES ONLY

INPUT FINISHED.

SORTING FINISHED.

DINDI FINISHED.

R 9.600+4.783

runoff dind

W 1540.6

Load paper, hit return

MEMORANDUM 4021-JDB
December 11, 1969

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL ENGINEERING

EXAMPLE DISTRIBUTION OF FACULTY AND STAFF

FIRST TERM 1969-70

FOR DEMONSTRATION PURPOSES ONLY

****

George, J. A.

10%	14641
30%	38505
60%	80076

Nance, D. J.

10%	14641
40%	31463
30%	38505
20%	81195

Camp, G. H.

40%	14641
10%	14643
50%	80050

Lewis, V. E.
100% 14641

Bromfeld, E.
50% 41708
50% 81197

OPTION LABELS

Until a few years ago one of the most hated jobs for one of the headquarters secretaries was addressing envelopes. In Electrical Engineering we average around one mailing per week to something like 200 faculty and staff members. Since we keep up-to-date address information in the Master Data File it was reasonable to generate mailing labels from this information. At present this is done by executing a program PLAY using as the input a file generated by PART1. Arguments which specify the ranks for which labels are desired are passed to the program at the time of execution. PLAY is the last program of our old system still in use and it will shortly be replaced by the SPLP option LABELS. The command sequence for PLAY is given on page 41 and on page 42 we present a listing of the output file which we generally print on standard-size pin-fed mailing labels.

r play fall labels prof asso teac rese

W 1547.3

EXECUTION.

PLAY STARTED

PLAY FINISHED

EXIT CALLED. PM MAY BE TAKEN.

R .833+.866

runoff labels

W1547.7

Load paper, hit return

Professor H. J. Sawyer

9-101

Professor J. A. George

9-708

Professor D. J. Nance

9-206

Professor G. H. Camp

9-165

V. E. Lewis

9-305

E. Bromfeld

9-306

OPTION BUDGET

The BUDGET option is the longest and most complex SPLP program which has been written to date. It takes as its input a Master Data File and creates an output file which reports budgeted allocations in selectable detail for one or more periods within a specified academic year. The detail provided in the output is selected by specifying a parameter in the execution command. This parameter has value byname -- all the names for the specified year and term(s) are listed by rank with a distribution by account of their allocated salaries; byrank -- only totals for each rank for the specified year and term(s) are written in the output file; and grand -- only the grand total for the specified year and term(s) is written in the output file.

Several examples will illustrate the various features of this option. On page 44 we illustrate the user-computer dialogue necessary to execute BUDGET on a Master Data File named "sample". The file created by the option is named "output" and is created in a level of detail specified by "byname" for the year defined by "69-70" and the terms defined by "summer", "first", and "second". The printed output file will be found on pages 45 through 47.

On page 48 we again execute BUDGET but this time with detail specified by "byrank" and only for terms "first" and "second" of the "69-70" year. Page 49 illustrates the output for this case. Our final example with BUDGET is with detail specified by "grand" and for the "second" term of the "69-70" year. The execution dialogue is given on page 50 and the resulting output on page 51.

r option budget sample output byname 69-70 summer first second

W 1654.9

Password for SUMMER

Password for FIRST

Password for SECOND

*This report is MEMORANDUM 4020-*JDB

This report is to be dated 11 December 1969

This report is PRELIMINARY, REVISED, or FINAL EXAMPLE

This report is for (which period) 1970 FISCAL YEAR

TYPE MESSAGE: FOR DEMONSTRATION PURPOSES ONLY.

R 17.516+7.483

MEMORANDUM 4020-JDB
11 December 1969

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL ENGINEERING

EXAMPLE BUDGET REPORT FOR SALARIES

1970 FISCAL YEAR

FOR DEMONSTRATION PURPOSES ONLY.

****

		SALARY		DSR		FUND		GENERAL
PROFESSORS								
Sawyer, H. J.	SUMMER	0.00						
	FIRST	0.00						
	SECOND	0.00						
		$ 0.00		$ 0.00		$ 0.00		$ 0.00
George, J. A.	SUMMER	0.00						
	FIRST	10000.00	60% 80076	6000.00	30% 38505	3000.00	10% 14641	1000.00
	SECOND	10000.00			100% 32456	10000.00		
		$ 20000.00		$ 6000.00		$ 13000.00		$ 1000.00
Nance, D. J.	SUMMER	3556.00	100% 81195	3556.00				

	FIRST	8000.00	20% 81195	1600.00	40% 31463	3200.00	10% 14641	800.00
					30% 38505	2400.00		
	SECOND	8000.00	50% 81195	4000.00	30% 31463	2400.00	10% 14641	800.00
							10% 14642	800.00
		$ 19556.00		$ 9156.00		$ 8000.00		$ 2400.00
TOTALS FOR RANK		$ 39556.00		$ 15156.00		$ 21000.00		$ 3400.00
ASSOCIATE PROFESSORS								
Camp, G. H.	SUMMER	3556.00			80% 32409	2844.80	10% 14643	355.60
							10% 14642	355.60
	FIRST	8000.00	50% 80050	4000.00			10% 14643	800.00
							40% 14641	3200.00
	SECOND	8000.00	35% 80050	2800.00			25% 14643	2000.00
							40% 14642	3200.00
		$ 19556.00		$ 6800.00		$ 2844.80		$ 9911.20
TOTALS FOR RANK		$ 19556.00		$ 6800.00		$ 2844.80		$ 9911.20
TEACHING ASSISTANTS								
Black, R. D.	SUMMER	1095.00					100% 14641	1095.00
		$ 1095.00		$ 0.00		$ 0.00		$ 1095.00
Booker, A. B.	SECOND	1575.00					100% 14641	1575.00
		$ 1575.00		$ 0.00		$ 0.00		$ 1575.00
Lewis, V. E.	FIRST	1575.00					100% 14641	1575.00
		$ 1575.00		$ 0.00		$ 0.00		$ 1575.00
TOTALS FOR RANK		$ 4245.00		$ 0.00		$ 0.00		$ 4245.00
RESEARCH ASSISTANTS								
Bromfeld, E.	FIRST	2250.00	50% 81197	1125.00	50% 41708	1125.00		
	SECOND	2250.00	100% 89118	2250.00				

	$ 4500.00	$ 3375.00	$ 1125.00	$ 0.00
TOTALS FOR RANK	$ 4500.00	$ 3375.00	$ 1125.00	$ 0.00
GRAND TOTALS	$ 67857.00	$ 25331.00	$ 24969.80	$ 17556.20

r option budget sample out*1* byrank 69-70 first second

W 1658.7

Password for FIRST

Password for SECOND

This report is MEMORANDUM 4020-JDB

This report is to be dated 11 December 1969

This report is PRELIMINARY, REVISED, or FINAL EXAMPLE

This report is for (which period) 1969-70 ACADEMIC YEAR

TYPE MESSAGE: FOR DEMONSTRATION PURPOSES ONLY.

R 14.316+6.616

MEMORANDUM 4020-J08
11 December 1969

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL ENGINEERING

EXAMPLE BUDGET REPORT FOR SALARIES

1969-70 ACADEMIC YEAR

FOR DEMONSTRATION PURPOSES ONLY.

****

	SALARY	DSR	FUND	GENERAL
PROFESSORS				
TOTALS FOR RANK	$ 36000.00	$ 11600.00	$ 21000.00	$ 3400.00
ASSOCIATE PROFESSORS				
TOTALS FOR RANK	$ 16000.00	$ 6800.00	$ 0.00	$ 9200.00
TEACHING ASSISTANTS				
TOTALS FOR RANK	$ 3150.00	$ 0.00	$ 0.00	$ 3150.00
RESEARCH ASSISTANTS				
TOTALS FOR RANK	$ 4500.00	$ 3375.00	$ 1125.00	$ 0.00
GRAND TOTALS	$ 59650.00	$ 21775.00	$ 22125.00	$ 15750.00

r option budget sample out2 grand 69-70 second

W 1108.8

Password for SECOND

This report is MEMORANDUM 4020-JDB

This report is to be dated 11 December 1969

This report is PRELIMINARY, REVISED, or FINAL EXAMPLE

This report is for (which period) SECOND TERM 1969-70

TYPE MESSAGE: FOR DEMONSTRATION R#PURPOSES ONLY.

R 11.683+5.450

MEMORANDUM 4020-JDB
11 December 1969

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ELECTRICAL ENGINEERING

EXAMPLE BUDGET REPORT FOR SALARIES

SECOND TERM 1969-70

FOR DEMONSTRATION PURPOSES ONLY.

****

	SALARY	DSR	FUND	GENERAL
GRAND TOTALS	$ 29825.00	$ 9050.00	$ 12400.00	$ 8375.00

MISCELLANEOUS OTHER OPTION

In addition to the options that we have discussed in some detail, there are three others which should be mentioned:

PRTSAL takes as its input file a Master Data File and creates an output file giving by name and rank the salary for each name entry occurring for a specified year and term.

UPSAL takes as its input file a Master Data File and creates an output file which is a new Master Data File containing updated salary information.

WARANT takes as its input a file created by PART1 and creates an output file which when edited and punched on cards yields an input card deck which "pays" the tuition of our Teaching Assistants and Instructors.

PROGRAM LISTINGS

On the following pages we list the SPLP programs for three options and one subroutine which is called by these options. The three options are PART1, PART2, and BUDGET. The subroutine is PROLOG which is responsible for most of the user-computer dialogue at the beginning of the three options.

```
M5095        648        PART1          MAD FOR   M5095          648        121069
          EXTERNAL FUNCTION                                                  00010
          E'O PART1.                                                         00020
         R                                                                   00030
         R THIS PROGRAM CREATES THE TEACHING AND                             00040
         R RESEARCH ASSIGNMENTS LISTING FOR A                                00050
         R SPECIFIC TERM FROM MASTER.                                        00060
         R THE CALL IS                                                       00070
         R                                                                   00080
         R R OPTION PART1 -NAME1- -NAME2-                                    C0090
         R                                                                   00100
         R WHERE NAME1 IS THE NAME OF THE INPUT FILE                         00110
         R AND NAME2 IS THE NAME OF THE OUTPUT FILE.                         00120
         R                                                                   00130
          N'R                                                                00140
          BEGIN.                                                             00150
          PRINT COMMENT $OPOAOROTO10 OSOTOAOROTOEODO.$                       00160
          RDNAM=COMAND.(1,FMT)                                               00170
          WRNAM=COMAND.(2,FMT)                                               00180
          T'O OPN                                                            00190
FMT       PRINT COMMENT $OCOMOMOAONODO OLOIONOEO OHOAOSO $                   00200
          PRINT COMMENT $OIOMOPOROOOPOEORO OFOOOROMOAOTO.$                   00210
          PRINT COMMENT $OROEOTOYOPOEO OTOHOEO OCOOOMOMOAONODO.$             00220
          ENDOUT.                                                            00230
         R                                                                   00240
         R OPEN FILES.                                                       00250
         R                                                                   00260
OPN       ROPEN1.(RDNAM,0)                                                   00270
          WOPEN1.(WRNAM,0)                                                   00280
          NULL=-0                                                            00290
          A=QUOTE.($020509$,000600400057K)                                   00300
          B=QUOTE.($0 OTOEOAOCOHOIONOGO OAOSOSOIOGONOMOEONOTOS$,             00310
         1 0C7300600057K)                                                    00320
          C=QUOTE.($0 OTOEOAOCOHOIONOGO OAONODO OROEOSOEOAOROCOHO OAOSO      00330
         1SOIOGONOMOEONOT$, 006200570057K)                                   00340
          PMM=QUOTE.($0.1P1A1G1I1N1GO 1M1O1D1EO 1M1A1R1G1I1N$)               00350
          LL=QUOTE.($0.1L1I1N1EO 1L1E1N1G1T1HO 0605$)                        00360
          UNDENT=QUOTE.($0.1U1N1D1E1N1TO 02$)                                00370
          UN4=QUOTE.($0.1U1N1D1E1N1TO 04$)                                   00380
          END=QUOTE.($0.1E1N$)                                               00390
          CENTER=QUOTE.($0.1C1E$)                                            00400
          AP=QUOTE.($0.1A1P1P1E1N1DO 0 $)                                    00410
          BREAK=QUOTE.($0.1B1R$)                                             00420
          LTGT=QUOTE.(055201350555K)                                         00430
          T1=QUOTE.($0D000 OPOAOROTO10 OFOOORO 0 $)                          00440
          T2=QUOTE.($0(OYOEOAORO)0 $)                                        00450
          T3=QUOTE.($0(OTOEOROMO)0 $)                                        00460
          PT1=QUOTE.($OPOAOROTO OI$)                                         00470
          BP=QUOTE.($0.1B1P$)                                                00480
          WRITE1.(1,PMM)                                                     00490
          WRITE1.(1,LL)                                                      00500
         R                                                                   00510
         R WRITE HEADING INFORMATION IN THE                                  00520
         R OUTPUT FILE.                                                      00530
         R                                                                   00540
          PROLOG.(A,B,C,65)                                                  00550
ONE       READ1.(EOF)                                                        00560
          EQUALS.(NULL,PT1,ONE)                                              00570
          WRITE1.(1,CENTER)                                                  00580
```

```
          WRITE1.(0)                                                    00590
          WRITE0.(1,T1)                                                 00600
GETYR     WRITA0.(1,T2)                                                 00610
          R                                                             00620
          R REQUEST FROM THE CONSOLE THE ACADEMIC YEAR                  00630
          R FOR WHICH THE SEARCH IS TO BE MADE.                         00640
          R                                                             00650
          READ0.(YEAR,GETYR)                                            00660
GETRM     WRITA0.(1,T3)                                                 00670
          R                                                             00680
          R REQUEST FROM THE CONSOLE THE TERM FOR                       00690
          R WHICH THE SEARCH IS TO BE MADE.                             00700
          R                                                             00710
          READ0.(TERM,GETRM)                                            00720
ALPHA     READ1.(EOF)                                                   00730
          R                                                             00740
          R SEARCH FOR BEGINNING OF A NAME BLOCK.                       00750
          R                                                             00760
          PTNA.(BETA)                                                   00770
          I=1                                                           00780
TWO       SAVE.(I)                                                      00790
          READ1.(EOF)                                                   00800
          EQUALS.(UN4,NULL,IONE)                                        00810
FOUR      READ1.(EOF)                                                   00820
          R                                                             00830
          R CHECK FOR ACADEMIC YEAR.                                    00840
          R                                                             00850
          EQUALS.(YEAR,NULL,THREE)                                      00860
          R                                                             00870
          R YEAR FOUND.                                                 00880
          R                                                             00890
FIVE      READ1.(EOF)                                                   00900
          EQUALS.(BREAK,NULL,FIVE)                                      00910
          T'O LTRM                                                      00920
DELTA     SAVE.(I)                                                      00930
LTRM      READ1.(EOF)                                                   00940
          EQUALS.(UNDENT,NULL,ZETA)                                     00950
ETA       READ1.(EOF)                                                   00960
          R                                                             00970
          R CHECK FOR TERM.                                             00980
          R                                                             00990
          EQUALS.(TERM,NULL,THETA)                                      01000
          R                                                             01010
          R TERM FOUND.                                                 01020
          R                                                             01030
IOTA      READ1.(EOF)                                                   01040
          EQUALS.(BREAK,NULL,IOTA)                                      01050
          READ1.(EOF)                                                   01060
          EQUALS.(LTGT,NULL,KAPPA)                                      01070
          I=1                                                           01080
          R                                                             01090
          R WRITE NAME BLOCK IN THE OUTPUT FILE IF                      01100
          R ACADEMIC YEAR AND TERM ARE FOUND.                           01110
          R                                                             01120
LAMBDA    RESTOR.(I)                                                    01130
          EQUALS.(BREAK,NULL,MU)                                        01140
NU        WRITE1.(0)                                                    01150
          READ1.(EOF)                                                   01160
XI        PTEN.(PI)                                                     01170
RHO       WRITE1.(1,END)                                                01180
```

```
          R                                                                    01190
          R END OF NAME BLOCK.  RETURN TO SEARCH FOR A                         01200
          R NEW NAME.                                                          01210
          R                                                                    01220
           T'O ALPHA                                                           01230
          R                                                                    01240
          R MISCELLANEOUS HOUSEKEEPING INSTRUCTIONS.                           01250
          R                                                                    01260
SIGMA      READ1.(EOF)                                                         01270
           EQUALS.(BP,NULL,ALPHA)                                              01280
BETA       WRITE1.(0)                                                          01290
           T'O ALPHA                                                           01300
ZETA       I=I+1                                                               01310
           PTEN.(DELTA)                                                        01320
           T'O SIGMA                                                           01330
THETA      PTEN.(ETA)                                                          01340
           T'O SIGMA                                                           01350
KAPPA      I=I+1                                                               01360
           SAVE.(I)                                                            01370
           J=1                                                                 01380
TAU        RESTOR.(J)                                                          01390
           W'R J .GE. I, T'O XI                                                01400
           WRITE1.(0)                                                          01410
           J=J+1                                                               01420
           T'O TAU                                                             01430
MU         WRITE1.(0)                                                          01440
           I=I+1                                                               01450
           T'O LAMBDA                                                          01460
PI         EQUALS.(UNDENT,NULL,NU1)                                            01470
           T'O CHI                                                             01480
NU1        EQUALS.(UN4,NULL,NU)                                                01490
CHI        READ1.(EOF)                                                         01500
           PTEN.(CHI)                                                          01510
           T'C RHO                                                             01520
IONE       I=I+1                                                               01530
           PTEN.(TWO)                                                          01540
           T'O SIGMA                                                           01550
THREE      PTEN.(FOUR)                                                         01560
           T'O SIGMA                                                           01570
(R                                                                             01580
          R NORMAL EXIT.                                                       01590
          R                                                                    01600
EOF        WRITAO.(1,AP)                                                       01610
           READO.(APFIL,FIN)                                                   01620
           WRITE1.(2,AP,APFIL)                                                 01630
FIN        PRINT COMMENT $OPOAOROTOIO OFOIONOIOSOHOEODO.$                      01640
           ENDOUT.                                                             01650
           E'N                                                                 01660
```

```
M5095        648        PART2          MAD FOR   M5095          648        121069
            EXTERNAL FUNCTION                                              00010
            E'O PART2.                                                     00020
           R PART2 READS A FILE GENERATED BY PART1 AND CREATES             00030
           R AN OUTPUT FILE CONTAINING SUBJECTS AND TYPE OF                00040
           R ASSIGNMENT (ROLE), NAME, AND PERCENTAGE FOR EACH              00050
           R FACULTY OR STAFF MEMBER INVOLVED IN THAT                      00060
           R SUBJECT. THE FILE IS SORTED IN SUBJECT-ROLE-NAME              00070
           R ORDER.                                                        00080
            N'R                                                            00090
            BEGIN.                                                         00100
            PRINT COMMENT $OPOAOROTO20 OSOTOAOROTOEODO.$                   00110
           R GET NAMES OF INPUT AND OUTPUT FILES                           00120
            RDNAM=COMAND.(1,FMT)                                           00130
            WRNAM=COMAND.(2,FMT)                                           00140
            T'O OPN                                                        00150
           R FORMAT ERROR IN COMMAND LINE- NOT ENOUGH                      00160
           R ARGUMENTS FOR PART2.                                          00170
FMT         PRINT COMMENT $OCOOOMOMOAONODO OLOIONOEO OHOAOS$               00180
            PRINT COMMENT $OIOMOPOROOOPOEORO OFOOOROMOAOTO.$               00190
            PRINT COMMENT $OROEOTOYOPOEO OTOHOEO OCOOOMOMOAONODC.$         00200
            ENDOUT.                                                        00210
OPN         RCPEN1.(RDNAM,0)                                               00220
            WOPEN1.(WRNAM,0)                                               00230
            NULL=-0                                                        00240
            I = 0                                                          00250
            NNF=QUOTE.($ONOOO ONOAOMOEO OAOFOTOEOR$)                       00260
            NOFILL=QUOTE.($0.1N1F$)                                        00270
            IN6=QUOTE.($0.1I1NO 06$)                                       00280
            BEGPAG=QUOTE.($0.1B1P$)                                        00290
            CENTER=QUOTE.($0.1C1E$)                                        00300
            PTWO=QUOTE.($OPOAOROTO OIOI$)                                  00310
            SPACE=QUOTE.($0.1S1P$)                                         00320
            LINE=QUOTE.($5-5-5-5-5-5-5-5-5-5-5-5-$)                        00330
            TAB=QUOTE.(007200570057K)                                      00340
            SIG=QUOTE.(050500570057K)                                      00350
            ZERO=QUOTE.($0 0 00$)                                          00360
            AP=QUOTE.($0.1A1P1P1E1N1DO 0 $)                                00370
ALPHA       READ1.(EOF)                                                    00380
            PTNA.(ALPHA)                                                   00390
ALPHAN      READ1.(EOF)                                                    00400
            READ1.(EOF)                                                    00410
           R OBTAIN NAME AND PUT IN 'NAM'.                                 00420
            NAME.(NAM,NULL,NULL,NULL,NONAME)                               00430
           R KEEP SCANNING UNTIL WE REACH '.EN' OR '.NA'.                  00440
BETA        READ1.(EOF)                                                    00450
            PTEN.(GAMMA)                                                   00460
            T'O ALPHA                                                      00470
GAMMA       PTNA.(GAMMAN)                                                  00480
            T'O ALPHAN                                                     00490
           R GET SUBJECT, ROLE, AND PERCENT...                             00500
GAMMAN      SUBJ.(SUB,ROL,PCT,NULL,BETA)                                   00510
           R ...AND PUT IN VECTOR FOR SORTING.                             00520
            IN.(4,SUB,RCL,NAM,PCT)                                         00530
            T'O BETA                                                       00540
NONAME      WRITEO.(2,NNF,NAM)                                             00550
            T'O ALPHA                                                      00560
EOF         PRINT COMMENT $OIONOPOUOTO OFOIONOIOSOHOEODO.$                 00570
            SORT.(4,SUB,ROL,NAM,PCT)                                       00580
```

```
          PRINT COMMENT $OSOOOROTOIONOGO OFOIONOIOSOHOEODO.$                00590
         R WRITE THE OUTPUT FILE HEADER.                                    00600
          WRITE1.(1,NOFILL)                                                 00610
          WRITE1.(1,IN6)                                                    00620
          WRITE1.(1,BEGPAG)                                                 00630
          WRITE1.(1,CENTER)                                                 00640
          WRITE1.(1,PTWO)                                                   00650
         R START OUTPUTTING SORTED VECTORS.                                 00660
DELTA     OUT.(4,A,B,C,C)                                                   00670
         R OUTPUTTING OF VECTORS FINISHED.                                  00680
         R WRITE ONE FINAL LINE...                                          00690
          WRITE1.(4,LINE,LINE,LINE,LINE)                                    00700
         R ...AND ASK FOR A FILE TO BE APPENDED.                            00710
          WRITAO.(1,AP)                                                     00720
          READO.(APFIL,FIN)                                                 00730
          WRITE1.(2,AP,APFIL)                                               00740
FIN       PRINT COMMENT $OPOAOROTO2O OFOIONOIOSOHOEODO.$                    00750
          ENDOUT.                                                           00760
         R SUBJECT IS NEW.                                                  00770
A         W'R I .NE. 0, T'O AL                                              00780
          I = 1                                                             00790
          T'O AN                                                            00800
AL        WRITE1.(4,LINE,LINE,LINE,LINE)                                    00810
AN        WRITE1.(1,SPACE)                                                  00820
          WRITE1.(1,SUB)                                                    00830
          T'O BN                                                            00840
         R ROLE IS NEW.                                                     00850
B         WRITE1.(1,SPACE)                                                  00860
BN        WRITE1.(2,TAB,ROL)                                                00870
         R NAME OR PERCENTAGE IS NEW.                                       00880
C         EQUALS.(PCT,ZERO,CN)                                              00890
          WRITE1.(3,TAB,TAB,NAM)                                            00900
          T'O DELTA                                                         00910
CN        W'R COUNT.(NAM) .GE. 10                                           00920
          WRITE1.(7,TAB,TAB,NAM,TAB,TAB,PCT,SIG)                            00930
          O'E                                                               00940
          WRITE1.(8,TAB,TAB,NAM,TAB,TAB,TAB,PCT,SIG)                        00950
          E'L                                                               00960
          T'O DELTA                                                         00970
          E'N                                                               00980
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M5095        648        BUDGET          MAD FOR   M5095          648        121069
 EXTERNAL FUNCTION                                                          00010
 E'O BUDGET.                                                                00020
R THIS PROGRAM COMPUTES THE BUDGET FROM THE                                 00030
R TEACHING ASSIGNMENTS. CALL IS                                            00040
R                                                                          00050
R R OPTION BUDGET -NAME1- -NAME2- -TYPE- -Y- -T- -T- -T-                   00060
R                                                                          00070
R WHERE NAME1 IS THE NAME OF THE INPUT FILE                                00080
R AND NAME2 IS THE NAME OF THE OUTPUT FILE.                                00090
R A THIRD FILE IS WRITTEN- 'UNALOC (MEMO)'.                                00100
R THE TYPE MUST BE 'GRAND', 'BYRANK', OR                                   00110
R 'BYNAME'. Y IS A STRING UNIQUE TO THE YEAR LINE                          00120
R IDENTIFYING THE APPROPRIATE SECTION OF THE                               00130
R INPUT FILE, AND SIMILARLY FOR T AND THE TERM                             00140
R LINE. UP TO THREE TERMS MAY BE SPECIFIED.                                00150
R THE ARGUMENTS MUST BE TYPED IN THE ORDER                                 00160
R GIVEN, BUT THOSE MISSING WILL BE REQUESTED                               00170
R BY THE PROGRAM. IF ONE OR MORE TERMS IS SUPPLIED                         00180
R IN THE COMMAND LINE, NO REQUEST FOR ADDITIONAL TERMS                     00190
R IS MADE BY THE PROGRAM.                                                  00200
 N'R                                                                       00210
 BEGIN.                                                                    00220
 BOOLEAN EQUALS.                                                           00230
 STATEMENT LABEL LABV1                                                     00240
R DATA FOR THREE TERMS                                                     00250
 D'N TERM(3),PW(3),LTERM(3)                                                00260
 V'S FT(1)...FT(3) = 0B                                                    00270
R YEAR LINE FOUND SWITCH                                                   00280
 V'S FY = 0B                                                               00290
R FILE NAMES INITIALIZED                                                   00300
 V'S RDNAM = 0                                                             00310
 V'S WRNAM = 0                                                             00320
R TYPE SWITCHES                                                            00330
 V'S TG = 0B                                                               00340
 V'S TR = 0B                                                               00350
 V'S TN = 0B                                                               00360
R HAVE TERM SWITCH                                                         00370
 V'S HT = 0B                                                               00380
R NO SALARY SWITCH                                                         00390
 V'S NS = 0B                                                               00400
R NONINITIAL RANK SWITCH                                                   00410
 V'S NR = 0B                                                               00420
R VECTORS TO STORE ACCOUNT DATA                                            00430
 D'N DNUMB(10),DPCT(10),DAMT(10)                                           00440
 D'N FNUMB(10),FPCT(10),FAMT(10)                                           00450
 D'N GNUMB(10),GPCT(10),GAMT(10)                                           00460
R RUNNING SUMS                                                             00470
 V'S BAMT(1)...BAMT(4) = 0                                                 00480
 V'S RAMT(1)...RAMT(4) = 0                                                 00490
 V'S NAMT(1)...NAMT(4) = 0                                                 00500
 V'S TAMT(1)...TAMT(4) = 0                                                 00510
 V'S DIFF = 0                                                              00520
R STRINGS REQUIRED BY THE PROGRAM                                          00530
 D'N SPACE(21)                                                             00540
 S1     = 006000570057K                                                    00550
 S2     = 0C60C0600057K                                                    00560
 S3     = 0060C0600060K                                                    00570
 GRAND = QUOTE.($0GOR0A$,004500240057K)                                    00580
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 BYRANK= QUOTE.(S0B0Y0R0A0N0K$)                                          00590
 BYNAME= QUOTE.(S0B0Y0N0A0M0E$)                                          00600
 PCN   = QUOTE.(057500570057K)                                           00610
 POFF  = QUOTE.(051700570057K)                                           00620
 RED   = QUOTE.(053300570057K)                                           00630
 BLACK = QUOTE.(053200570057K)                                           00640
 PWFOR = QUOTE.($0P1A1S1S1W101R1D0 1F101R$,S1)                           00650
 QTYPE = QUOTE.($0T0Y0P0E0(0 $)                                          00660
 QYEAR = QUOTE.($0Y0E0A0R0(0 $)                                          00670
 QTERM = QUOTE.($0T0E0R0M0(0 $)                                          00680
 X     = QUOTE.(007700570057K)                                           00690
 PSSX  = QUOTE.($0.0 0 $,007700570057K)                                  00700
 P     = QUOTE.(003300570057K)                                           00710
 PDSX  = QUOTE.(003300530060K,007700570057K)                             00720
 PS    = QUOTE.(050500600057K)                                           00730
 SP1   = QUOTE.($0.1S1P$,006000010057K)                                  00740
 SP3   = QUOTE.($0.1S1P$,006000030057K)                                  00750
 UN4   = QUOTE.($0.1U1N1D1E1N1T0 04$)                                    00760
 UN2   = QUOTE.($0.1U1N1D1E1N1T0 02$)                                    00770
 NOFILL= QUOTE.($0.1N1F$)                                                00780
 PMM   = QUOTE.($0.1P1A1G1I1N1G0 1M101D1E0 1M1A1R1G1I1N$)                00790
 LL111 = QUOTE.($0.1L1I1N1E0 1L1E1N1G1T1H0 0101101$)                     00800
 MEMONO= QUOTE.($040002$,000000400057K)                                  00810
 BR    = QUOTE.($0 0B0U0D0G0E0T0 0R0E0P0D0R0T0,0 $)                      00820
 BRFS  = QUOTE.($0 0B0U0D0G0E0T0 0R0E0P0D0R0T0 0F0D0R$,                  00830
1 $0 0S0A0L0A0R0I0E0S$)                                                  00840
 DOL   = QUOTE.(005300570057K)                                           00850
 OLDACC= QUOTE.($010406$,000300000057K)                                  00860
 ZERPCT= QUOTE.($0 0 00$)                                                00870
 SALRY = QUOTE.($0S0A0L0A0R0Y$)                                          00880
 DSR   = QUOTE.($0D0S0R$)                                                00890
 END   = QUOTE.($0F0U0N$,002400570057K)                                  00900
 GEN   = QUOTE.($0G0E0N0E0R0A0L$)                                        00910
 LINE  = QUOTE.(054005400540K,054005400540K,                             00920
1 054005400540K,054000570057K)                                           00930
 TFR   = QUOTE.($0T0D0T0A0L0S0 0F0D0R0 0R0A0N0K$)                        00940
 GTM   = QUOTE.($0G0R0A0N0D0 0T0D0T0A0L0S$)                              00950
 NONE  = QUOTE.($1N101N$,012500570057K)                                  00960
 NSMESS= QUOTE.($1N1D0 1S1A1L1A1R1Y$)                                    00970
 NNFA  = QUOTE.($0N1D0 1N1A1M1E0 1F1Q1U1N1D0 1A1F1T1E1R$)                00980
 NAMEIS= QUOTE.($0N1A1M1E0 1I$,016200600057K)                             00990
 LINEIS= QUOTE.($530 1L1I1N1E0 1I1S$).                                   01000
 SPACE(1) = QUOTE.(S1)                                                   01010
 SPACE(2) = QUOTE.(S2)                                                   01020
 SPACE(3) = QUOTE.(S3)                                                   01030
 SPACE(4) = QUOTE.(S3,S1)                                                01040
 SPACE(5) = QUOTE.(S3,S2)                                                01050
 SPACE(6) = QUOTE.(S3,S3)                                                01060
 SPACE(7) = QUOTE.(S3,S3,S1)                                             01070
 SPACE(8) = QUOTE.(S3,S3,S2)                                             01080
 SPACE(9) = QUOTE.(S3,S3,S3)                                             01090
 SPACE(10) = QUOTE.(S3,S3,S3,S1)                                         01100
 SPACE(11) = QUOTE.(S3,S3,S3,S2)                                         01110
 SPACE(12) = QUOTE.(S3,S3,S3,S3)                                         01120
 SPACE(13) = QUOTE.(S3,S3,S3,S3,S1)                                      01130
 SPACE(14) = QUOTE.(S3,S3,S3,S3,S2)                                      01140
 SPACE(15) = QUOTE.(S3,S3,S3,S3,S3)                                      01150
 SPACE(16) = QUOTE.(S3,S3,S3,S3,S3,S1)                                   01160
 SPACE(17) = QUOTE.(S3,S3,S3,S3,S3,S2)                                   01170
 SPACE(18) = QUOTE.(S3,S3,S3,S3,S3,S3)                                   01180
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          SPACE(19) = QUOTE.(S3,S3,S3,S3,S3,S3,S1)                          01190
          SPACE(20) = QUOTE.(S3,S3,S3,S3,S3,S3,S2)                          01200
          SPACE(21) = QUOTE.(S3,S3,S3,S3,S3,S3,S3)                          01210
          NULL  = -0                                                        01220
          WSCLR.                                                            01230
          APEND.(9,SPACE(15),SPACE(11),LINE,SPACE(15),LINE,                 01240
         1 SPACE(15),LINE,SPACE(15),LINE)                                   01250
          TLINES= SAVE.(7)                                                  01260
         R GET ARGUMENTS                                                    01270
          RDNAM = COMAND.(1,NOTYPE)                                         01280
          WRNAM = COMAND.(2,NOTYPE)                                         01290
          TYPE  = QUOTE6.(COMAND.(3,NOTYPE))                                01300
          REMLEB.(TYPE)                                                     01310
CKTYPE    W'R EQUALS.(TYPE,GRAND,0)                                         01320
             TG = 1B                                                        01330
          O'R EQUALS.(TYPE,BYRANK,0)                                        01340
             TR = 1B                                                        01350
          O'R EQUALS.(TYPE,BYNAME,0)                                        01360
             TN = 1B                                                        01370
          O'E                                                               01380
             T'O NOTYPE                                                     01390
          E'L                                                               01400
          YEAR  = QUOTE6.(COMAND.(4,NOYEAR))                                01410
          REMLEB.(YEAR)                                                     01420
          TERM(1) = QUOTE6.(COMAND.(5,NOTERM))                              01430
          REMLEB.(TERM(1))                                                  01440
          IMAX = 1                                                          01450
          TERM(2) = QUOTE6.(COMAND.(6,GETPW))                               01460
          REMLEB.(TERM(2))                                                  01470
          IMAX = 2                                                          01480
          TERM(3) = QUOTE6.(COMAND.(7,GETPW))                               01490
          REMLEB.(TERM(3))                                                  01500
          IMAX = 3                                                          01510
         R GET PASSWORDS                                                    01520
GETPW     T'H DONEPW, FOR I = 1,1, I .G. IMAX                               01530
             RSSRB.(0)                                                      01540
             WRITAO.(5,PON,RED,PWFOR,TERM(I),POFF)                          01550
             READO.(PASSWD,DONEPW)                                          01560
DONEPW       PW(I) = KEY.(PASSWD)                                           01570
          WRITAO.(2,BLACK,PON)                                              01580
          RSSRB.(0)                                                         01590
          T'O OPEN                                                          01600
NOTYPE    RSSRB.(0)                                                         01610
          WRITAO.(1,QTYPE)                                                  01620
          READO.(TYPE,NOTYPE)                                               01630
          T'O CKTYPE                                                        01640
NOYEAR    RSSRB.(0)                                                         01650
          WRITAO.(1,QYEAR)                                                  01660
          READO.(YEAR,NOYEAR)                                               01670
NOTERM    RSSRB.(0)                                                         01680
          WRITAO.(1,QTERM)                                                  01690
          READO.(TERM(1),NOTERM)                                            01700
          IMAX = 1                                                          01710
          READO.(TERM(2),GETPW)                                             01720
          IMAX = 2                                                          01730
          READO.(TERM(3),GETPW)                                             01740
          IMAX = 3                                                          01750
          T'O GETPW                                                         01760
         R OPEN FILES                                                       01770
OPEN      ROPEN1.(RDNAM,$(MEMO)$)                                           01780
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          FWN1=WOPEN1.(WRNAM,$(MEMO)$)                                                    01790
         R OPEN A FILE FOR UNALLOCATED AMOUNTS                                            01800
          FWN2=WOPEN2.($UNALOC$,$(MEMO)$)                                                 01810
         R INSERT HEADER INTO OUTPUT FILE                                                 01820
          WRITE1.(1,NOFILL)                                                               01830
          WRITE1.(1,PMM)                                                                  01840
          WRITE1.(1,LL111)                                                                01850
          PROLOG.(MEMONO,BR,BRFS,111)                                                     01860
          WRITE1.(1,SP3)                                                                  01870
         R WRITE COLUMN HEADINGS                                                          01880
          WRITE1.(10,SPACE(15),SPACE(15),SALRY,SPACE(11),SPACE(11),                       01890
         1 DSR,SPACE(21),FND,SPACE(18),GEN)                                               01900
          WRITE1.(1,SP3)                                                                  01910
         R BEGIN READING INPUT FILE                                                       01920
A         READ1.(EOF)                                                                    01930
          RANK.(RK,B)                                                                     01940
         R WE HAVE A NEW RANK                                                             01950
             W'R TR .OR. TN                                                               01960
                W'R NR, WRTOT.(TFR,RAMT)                                                  01970
         R     (WRITE OLD RANK TOTALS)                                                    01980
                WRITE1.(1,SP1)                                                            01990
                WRITE1.(1,RK)                                                             02000
             E'L                                                                          02010
         R   UPDATE BUDGET TOTALS WITH RANK TOTALS                                        02020
             T'H UPDB, FOR K = 1,1,K .G. 4                                                02030
                BAMT(K) = BAMT(K) + RAMT(K)                                               02040
UPDB            RAMT(K) = 0                                                               02050
             NR = 1B                                                                      02060
             T'O A                                                                        02070
B         PTNA.(A)                                                                       02080
          READ1.(AEOF)                                                                   02090
          READ1.(AEOF)                                                                   02100
         R CHECK FOR NAME                                                                 02110
          SUBL.(X,PSSX,P,NONAME)                                                          02120
          NAM = SAVE.(1)                                                                  02130
          NAMPAD= SPACE(20 - COUNT.(NAM))                                                 02140
         R LOOK FOR YEAR                                                                  02150
C         READ1.(AEOF)                                                                   02160
          SWITCH.(A,C,C)                                                                  02170
         R (SWITCH IS AN INTERNAL FUNCTION, Q.V.)                                         02180
          T'O C                                                                           02190
D         READ1.(AEOF)                                                                   02200
          W'R FY                                                                          02210
         R   (NOT THE FIRST TIME)                                                         02220
             EQUALS.(NULL,YEAR,C)                                                         02230
          O'E                                                                             02240
         R   (THE FIRST TIME)                                                             02250
             SUBS.(0,YEAR,YEAR,C)                                                         02260
             YEAR = SAVE.(2)                                                              02270
             FY = 1B                                                                      02280
          E'L                                                                             02290
         R YEAR FOUND, LOOK FOR TERM                                                      02300
          HT = 0B                                                                         02310
E         READ1.(AEOF)                                                                   02320
          SWITCH.(GAM,GAM,F)                                                              02330
          T'O E                                                                           02340
F         READ1.(AEOF)                                                                   02350
          T'H CKT, FOR I = 1,1,I .G. IMAX                                                 02360
             W'R FT(I)                                                                    02370
         R       (NOT THE FIRST TIME FOR TERM(I))                                         02380
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                EQUALS.(NULL,LTERM(I),CKT)                                  02390
            O'E                                                             02400
        R       (THE FIRST TIME FOR TERM (I))                               02410
                SUBS.(0,TERM(I),TERM(I),CKT)                                02420
                LTERM(I) = SAVE.(I+2)                                       02430
                FT(I) = 1B                                                  02440
            E'L                                                             02450
            T'O FOUNDT                                                      02460
CKT         C'E                                                             02470
         T'O E                                                              02480
        R RESET ENTRY COUNTERS                                              02490
FOUNDT      DCT = 0                                                         02500
            FCT = 0                                                         02510
            GCT = 0                                                         02520
        R LOOK FOR SALARY                                                   02530
         READ1.(AEOF)                                                       02540
         SWITCH.(GAM,GAM,F)                                                 02550
         ASUBL.(X,PDSX,X,NOSAL)                                             02560
        R SALARY FOUND- DECIPHER                                            02570
         DECRYP.(PW(I),GARBLE)                                              02580
        R AND CONVERT TO INTEGER, RESETTING NO SAL SWITCH                   02590
         TAMT(1) = INT.(NULL,SOVFLO)                                        02600
         NS = 0B                                                            02610
         T'O LOOP                                                           02620
        R NO SALARY FOUND- ZERO AND SET NO SAL SWITCH                       02630
NOSAL    TAMT(1) = 0                                                        02640
         NS = 1B                                                            02650
         T'O GACT                                                           02660
LOOP     READ1.(AEOF)                                                      02670
         SWITCH.(ALF1,ALF1,ALF2)                                            02680
        R KEEP GOING UNTIL .EN, .UN4, OR .UN2                               02690
GACT     ACCT.(ACC,NUMB,PCT,LOOP)                                           02700
         W'R EQUALS.(NUMB,OLDACC,0) .AND. EQUALS.(PCT,ZERPCT,0),            02710
        1 T'O LOOP                                                          02720
         AMT = TAMT(1) * INT.(PCT,POVFLO)                                   02730
        R ENTER ENTRY IN THE PROPER VECTOR                                  02740
ENTER    W'R EQUALS.(ACC,DSR,0)                                             02750
            TAMT(2) = TAMT(2) + AMT                                         02760
           W'R TN                                                           02770
               W'R DCT .L. 10, DCT = DCT + 1                                02780
               DNUMB(DCT) = NUMB                                            02790
               DPCT (DCT) = PCT                                             02800
               DAMT (DCT) = AMT                                             02810
            E'L                                                             02820
         O'R EQUALS.(ACC,FND,0)                                             02830
            TAMT(3) = TAMT(3) + AMT                                         02840
            W'R TN                                                          02850
               W'R FCT .L. 10, FCT = FCT + 1                                02860
               FNUMB(FCT) = NUMB                                            02870
               FPCT(FCT) = PCT                                              02880
               FAMT(FCT) = AMT                                              02890
            E'L                                                             02900
         O'E                                                                02910
            TAMT(4) = TAMT(4) + AMT                                         02920
            W'R TN                                                          02930
               W'R GCT .L. 10, GCT = GCT + 1                                02940
               GNUMB(GCT) = NUMB                                            02950
               GPCT(GCT) = PCT                                              02960
               GAMT(GCT) = AMT                                              02970
            E'L                                                             02980
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          E'L                                                          02990
          T'O LOOP                                                     03000
         R RETURN ADDRESSES                                            03010
ALF1      LABV1 = GAM                                                  03020
          T'O ALF                                                      03030
ALF2      LABV1 = F                                                    03040
         R COMPUTE SALARY IN CENTS                                     03050
ALF       TAMT(1) = TAMT(1) * 100                                      03060
         R COMPUTE UNALLOCATED AMOUNT                                  03070
          TDIFF = TAMT(1) - TAMT(2) - TAMT(3) - TAMT(4)                03080
          DIFF  = DIFF  + TDIFF                                        03090
         R ENTER IN UNALOC IF NECESSARY                                03100
          W'R TDIFF .L. 0                                              03110
             WSCLR.                                                    03120
             APEND.(4,NAM,NAMPAD,TERM(I),RED)                          03130
             APDC.(TDIFF,41)                                           03140
         R    (APDC IS AN INTERNAL FUNCTION, Q.V.)                     03150
             APEND.(1,BLACK)                                           03160
             WRITE2.(0)                                                03170
          O'R TDIFF .G. 0                                              03180
             WSCLR.                                                    03190
             APEND.(4,NAM,NAMPAD,TERM(I),SPACE(20))                    03200
             APDC.(TDIFF,60)                                           03210
             WRITE2.(0)                                                03220
          O'R NS                                                       03230
             WSCLR.                                                    03240
             APEND.(6,NAM,NAMPAD,TERM(I),SPACE(21),                    03250
         1   SPACE(10-COUNT.(TERM(I))),NSMESS)                         03260
             WRITE2.(0)                                                03270
          E'L                                                          03280
         R GENERATE OUTPUT. THE OUTPUT USES THE MINIMUM                03290
         R NUMBER OF LINES NECESSARY- THE LARGEST OF                   03300
         R DCT, FCT, AND GCT.                                          03310
          W'R TN                                                       03320
             T'H WRT1, FOR J = 1,1,J .G. 10                            03330
                WSCLR.                                                 03340
                W'R J .E. 1                                            03350
                   W'R .NOT. HT                                        03360
                      WRITE1.(1,SP3)                                   03370
                      APEND.(2,NAM,NAMPAD)                             03380
                   O'E                                                 03390
                      APEND.(1,SPACE(20))                              03400
                   E'L                                                 03410
                   APEND.(1,TERM(I))                                   03420
                   W'R NS                                              03430
                      CANON.(NULL)                                     03440
                      APEND.(2,SPACE(32-COUNT.(NULL)),NONE)            03450
                   O'E                                                 03460
                      APDC.(TAMT(1),36)                                03470
                   E'L                                                 03480
                O'E                                                    03490
                   APEND.(2,SPACE(18),SPACE(18))                       03500
                E'L                                                    03510
                W'R J .LE. DCT                                         03520
                   APEND.(4,SPACE(2),DPCT(J),PS,DNUMB(J))              03530
                   APDC.(DAMT(J),61)                                   03540
                O'R (J .LE. FCT) .OR. (J .LE. GCT)                     03550
                   APEND.(2,SPACE(12),SPACE(13))                       03560
                O'E                                                    03570
         R NORMAL EXIT IS HERE. SET HAVE TERM SWITCH.                  03580
```

```
                    HT = 1B                                                  03590
                    W'R J .E. 1, WRITE1.(0)                                  03600
                    T'O BET                                                  03610
                E'L                                                          03620
                W'R J .LE. FCT                                               03630
                    APEND.(4,SPACE(2),FPCT(J),PS,FNUMB(J))                   03640
                    APDC.(FAMT(J),86)                                        03650
                O'R J .LE. GCT                                               03660
                    APEND.(2,SPACE(12),SPACE(13))                            03670
                O'E                                                          03680
                    T'O WRT1                                                 03690
                E'L                                                          03700
                W'R J .LE. GCT                                               03710
                    APEND.(4,SPACE(2),GPCT(J),PS,GNUMB(J))                   03720
                    APDC.(GAMT(J),111)                                       03730
                E'L                                                          03740
WRT1            WRITE1.(0)                                                   03750
            R WE GET HERE ON VECTOR OVERFLOW ONLY.                           03760
                PRINT COMMENT $OVOEOCOTOOORO OOOVOEOROFOLOOOWO.$             03770
                WRITEO.(3,NAMEIS,NAM,LINEIS)                                 03780
                WRITEO.(0)                                                   03790
             E'L                                                             03800
            R UPDATE NAME TOTALS WITH TERM TOTALS                            03810
BET          T'H UPDN, FOR K = 1,1,K .G. 4                                   03820
                NAMT(K) = NAMT(K) + TAMT(K)                                  03830
UPDN            TAMT(K) = 0                                                  03840
             T'O LABV1                                                       03850
GAM          W'R HT .AND. TN, WRTOT.(SPACE(6),NAMT)                          03860
            R UPDATE RANK TOTALS WITH NAME TOTALS                            03870
             T'H UPDR, FOR K = 1,1,K .G. 4                                   03880
                RAMT(K) = RAMT(K) + NAMT(K)                                  03890
UPDR            NAMT(K) = 0                                                  03900
             T'O A                                                           03910
            R INTERNAL FUNCTION DEFINITIONS.                                 03920
             INTERNAL FUNCTION (SWA,SWB,SWC)                                 03930
             E'O SWITCH.                                                     03940
             STATEMENT LABEL SWA, SWB, SWC                                   03950
            R SWITCHES CONTROL ON .EN, .UN4, OR .UN2                         03960
            R TO SWA, SWB, OR SWC, RESPECTIVELY.                             03970
             N'R                                                             03980
             PTEN.(SWD)                                                      03990
             T'O SWA                                                         04000
SWD          EQUALS.(NULL,UN4,SWE)                                           04010
             T'O SWB                                                         04020
SWE          EQUALS.(NULL,UN2,SWF)                                           04030
             T'O SWC                                                         04040
SWF          F'N                                                             04050
             E'N                                                             04060
             INTERNAL FUNCTION (TOTMES,TOT)                                  04070
             E'O WRTOT.                                                      04080
            R WRITES FOUR LINES AND FOUR DOLLAR TOTALS.                      04090
             N'R                                                             04100
             WRITE1.(1,TLINES)                                               04110
             WSCLR.                                                          04120
             APEND.(1,TOTMES)                                                04130
             APEND.(1,SPACE(25-COUNT.(NULL)))                                04140
             T'H WT, FOR N = 1,1,N .G. 4                                     04150
                APEND.(1,DOL)                                                04160
                APDC.(TOT(N),11+N*25)                                        04170
WT              W'R N .L. 4, APEND.(1,SPACE(14))                             04180
```

```
          WRITE1.(0)                                                        04190
          F'N                                                               04200
          E'N                                                               04210
          INTERNAL FUNCTION (APA,APN)                                       04220
          E'O APDC.                                                         04230
         R APPENDS DOLLARS AND CENTS TO THE WORKSPACE.                      04240
          N'R                                                               04250
          APAD = APA / 100                                                  04260
          APAC = APA - APAD * 100                                           04270
          APEND.(1,X)                                                       04280
          APINT.(APAD)                                                      04290
          APEND.(1,P)                                                       04300
          W'R APAC .L. 10, APINT.(0)                                        04310
          APINT.(APAC)                                                      04320
          CANON.(NULL)                                                      04330
          SUBS.(0,X,SPACE(APN-COUNT.(NULL)+1),APO)                          04340
          F'N                                                               04350
APO       PRINT COMMENT $OOOVOEOROFOLOOOWO OIONO OAOPODOCO.$                04360
          WRITEO.(3,NAMEIS,NAM,LINEIS)                                      04370
          WRITEO.(0)                                                        04380
          F'N                                                               04390
          E'N                                                               04400
         R END OF FILE- WRITE TOTALS.                                       04410
EOF       W'R TR .OR. TN, WRTOT.(TFR,RAMT)                                  04420
         R UPDATE BUDGET TOTALS WITH RANK TOTALS                            04430
          T'H UPDFIN, FOR K = 1,1,K .G. 4                                   04440
UPDFIN       BAMT(K) = BAMT(K) + RAMT(K)                                    04450
          WRTOT.(GTM,BAMT)                                                  04460
         R WRITE TOTAL IN UNALOC                                            04470
          WRITE2.(5,SPACE(15),SPACE(15),LINE,SPACE(10),LINE)                04480
          WSCLR.                                                            04490
          W'R DIFF .L. 0                                                    04500
             APEND.(4,SPACE(15),SPACE(14),RED,DOL)                          04510
             APDC.(DIFF,41)                                                 04520
             APEND.(1,BLACK)                                                04530
          O'E                                                               04540
             APEND.(5,SPACE(15),SPACE(15),SPACE(15),SPACE(4),DOL)           04550
             APDC.(DIFF,60)                                                 04560
          E'L                                                               04570
          WRITE2.(0)                                                        04580
          T'O FIN                                                           04590
         R MISCELLANECUS ERROR HANDLERS...                                  04600
NONAME    WRITEO.(2,NNFA,NAM)                                               04610
          T'O A                                                             04620
GARBLE    PRINT COMMENT $ODOEOCOIOPOHO OEORORDORO.$                         04630
          WRITEO.(3,NAMEIS,NAM,LINEIS)                                      04640
          WRITEO.(0)                                                        04650
          T'O NOSAL                                                         04660
SOVFLO    PRINT COMMENT $OSOAOLOAOROYO OCOOONOVOEOROSOIOOONO $,             04670
         1 $COOVOEOROFOLOOOWO.$                                             04680
          WRITEO.(3,NAMEIS,NAM,LINEIS)                                      04690
          WRITEO.(0)                                                        04700
          T'O NOSAL                                                         04710
POVFLO    PRINT COMMENT $OPOEOROCOEONOTC OCOOONOVOEGROSOIOOON$,             04720
         1 $O OOOVOEOROFOLOOOWO.$                                           04730
          WRITEO.(3,NAMEIS,NAM,LINEIS)                                      04740
          WRITEO.(0)                                                        04750
          AMT = 0                                                           04760
          T'O ENTER                                                         04770
AEOF      PRINT COMMENT $OAOBONOOOROMOAOLO OEOOOFO.$                        04780
```

```
          WRITEO.(3,NAMEIS,NAM,LINEIS)                                    04790
          WRITEO.(0)                                                      04800
         R THE FOLLOWING LEAVES BOTH OUTPUT FILES                         04810
         R IN TEMPORARY PRIVATE MODE.                                     04820
FIN       BFCLOS.(FWN1,$(MEMO)$,CLSERR)                                   04830
          BFCLOS.(FWN2,$(MEMO)$,CLSERR)                                   04840
          CHFILE.(FWN1,$(MEMO)$,21K,NULL,NULL)                            04850
          CHFILE.(FWN2,$(MEMO)$,21K,NULL,NULL)                            04860
          ENDOUT.                                                         04870
CLSERR    PRINT COMMENT $OEORORO0ORO OICNO OCOAOLOLO OT$,                 04880
         1$000 OCOLO0OSOEO OAONO O0OUOTOPOUOTO OFOIOLOEO.$                04890
          ENDOUT.                                                         04900
          E'N                                                             04910
```

PROLOG MAD

```
        EXTERNAL FUNCTION (A,B,C,LL)
        E'O PROLOG.
        D'N TAB(12),SPACE(9)
        N'R
        MEMO=QUOTE.($0M0E0M000R0A0N0D0U$, 004400600057K)
        SP4=QUOTE.($0.1S1P0 04$)
        SP1=QUOTE.($0.1S1P0 01$)
        HEADER=QUOTE.($0.1H1E1A1D1E$, 015100600057K)
        CENTER=QUOTE.($0.1C1E$)
        T1=QUOTE.($0T1H111S0 1R1E1P101R1T0 111S0 $)
        T21=QUOTE.($1T100 1B1E0 1D1A1T1E1D0 $)
        T31=QUOTE.($0P0R0E0L0I0M0I0N0A0R0Y0,0 0R0E0V0I0S0E0D0,$)
        T32=QUOTE.($0 101R0 0F0I0N0A0L$, 006000570057K)
        T41=QUOTE.($1F101R0 0(1W1H111C1H0 1P1E1R111101D0)0 $)
        MIT1=QUOTE.($0M0A0S0S0A0C0H0U0S0E0T0T$, 006200600057K)
        MIT2=QUOTE.($0I0N0S0T0I0T0U0T0E0 000F$)
        MIT3=QUOTE.($0 0T0E0C0H0N0000L00$, 002700700057K)
        EE1=QUOTE.($0D0E0P0A0R0T0M0E0N0T0 00$, 002600600057K)
        EE2=QUOTE.($0E0L0E0C0T0R0I0C0A$, 004300600057K)
        EE3=QUOTE.($0E0N0G0I0N0E0E0R0I$, 004500270057K)
        TB1=007200570057K
        TB2=007200720057K
        TB3=007200720072K
        TAB(0)=0
        TAB(1)= QUOTE.(TB1)
        TAB(2)=QUOTE.(TB2)
        TAB(3)=QUOTE.(TB3)
        TAB(4)=QUOTE.(TB3,TB1)
        TAB(5)=QUOTE.(TB3,TB2)
        TAB(6)=QUOTE.(TB3,TB3)
        TAB(7)=QUOTE.(TB3,TB3,TB1)
        TAB(8)=QUOTE.(TB3,TB3,TB2)
        TAB(9)=QUOTE.(TB3,TB3,TB3)
        TAB(10)=QUOTE.(TB3,TB3,TB3,TB1)
        TAB(11)=QUOTE.(TB3,TB3,TB3,TB2)
        TAB(12)=QUOTE.(TB3,TB3,TB3,TB3)
        SPACE(0)=QUOTE.(005700570057K)
        SPACE(1)=QUOTE.(006000570057K)
        SPACE(2)=QUOTE.(006000600057K)
        SPACE(3)=QUOTE.(006000600060K)
        SPACE(4)=QUOTE.(006000600060K, 006000570057K)
        SPACE(5)=QUOTE.(006000600060K, 006000600057K)
        SPACE(6)=QUOTE.(006000600060K, 006000600060K)
        SPACE(7)=QUOTE.(006000600060K, 006000600060K, 006000570057K)
        SPACE(8)=QUOTE.(006000600060K, 006000600060K, 006000600057K)
        SPACE(9)=QUOTE.(006000600060K, 006000600060K, 006000600060K)
        MESS=QUOTE.($0T0Y0P0E0 0M0E0S0S0A0G0E0:0 0 $)
        STAR=QUOTE.($0*0*0*0*0*0*0*0*0*0*0*0*0*0*0*0*0*0*0*0*0*$)
GETNO   WRITA0.(3,T1,MEMO,A)
        READ0.(A1,GETNO)
        I=LL-COUNT.(MEMO)-COUNT.(A)-COUNT.(A1)
        J=I/10
        K=I-J*10
        WRITE1.(5,TAB(J),SPACE(K),MEMO,A,A1)
GDATE   WRITA0.(2,T1,T21)
```

```
          READ0.(DATE,GDATE)
          I=LL-COUNT.(DATE)
          J=I/10
          K=I-J*10
          WRITE1.(3,TAB(J),SPACE(K),DATE)
GTYPE     WRITA0.(3,T1,T31,T32)
          READ0.(TYPE,GTYPE)
GTERM     WRITA0.(2,T1,T41)
          READ0.(TERM,GTERM)
          WRITE1.(4,HEADER,TYPE,B,TERM)
          WRITE1.(1,SP4)
          WRITE1.(1,CENTER)
          WRITE1.(3,MIT1,MIT2,MIT3)
          WRITE1.(1,SP1)
          WRITE1.(1,CENTER)
          WRITE1.(3,EE1,EE2,EE3)
          WRITE1.(1,SP1)
          WRITE1.(1,CENTER)
          WRITE1.(2,TYPE,C)
          WRITE1.(1,SP1)
          WRITE1.(1,CENTER)
          WRITE1.(1,TERM)
          WRITE1.(1,SP1)
          WRITA0.(1,MESS)
RDONE     READ0.(TEXT,EXT)
          WRITE1.(1,TEXT)
          T'O RDONE
EXT       WRITE1.(1,SP1)
          WSCLR.
          APEND.(6,STAR,STAR,STAR,STAR,STAR,STAR)
          TRUNC.(-0,LL)
          WRITE1.(0)
          WRITE1.(1,SP1)
          FUNCTION RETURN
          E'N
```

FORMS USED IN MAINTAINING THE MASTER DATA FILE

In a department as large as the Department of Electrical Engineering it is often necessary to formalize some of the communication through the exchange of paper forms. The next four pages illustrate forms which we use extensively. The form on page 71 is our way of requesting from a faculty member some indication of the assignment he desires for the next term. (A similar form is used for the other ranks within the department.) Based upon the responses I obtain, I make Preliminary Teaching and Research Assignments for the term and distribute these assignments to the faculty and staff along with the cover sheet illustrated on page 72. These cover sheets are returned and from this set of responses we revise the Preliminary assignments. These revised assignments are also distributed to the faculty and staff but with no opportunity for them to request changes. Final assignments are distributed shortly after the term begins and reflect those changes necessitated by fluctuations in enrollment.

The forms on pages 73 and 74 are used for communication within our administrative offices. The first of these communicates action to be taken with respect to the appointment of a graduate assistant; the second communicates changes in distribution and account numbers guaranteeing their entry on the appropriate records.

DEPARTMENT OF ELECTRICAL ENGINEERING

October 28, 1969

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASSACHUSETTS 02139

Memorandum to: All Professors and Instructors in The Department of Electrical Engineering

From: Professor James D. Bruce

Within the next two weeks, the Department will begin to prepare the Preliminary Teaching and Research Assignments for the Second Term of the 1969-70 Academic Year. In order to facilitate the preparation of these assignments, would you please indicate below the assignment you desire. Also, if you are in-charge of a subject (or subjects) requiring staff in addition to yourself, please indicate the names of those you wish to have assist you. To assist you in replying, I am enclosing a copy of Memorandum 3575-BF which indicates the subjects which will be taught in the spring, the expected enrollment, and the expected staffing requirements. A reply by November 10, 1969 would be appreciated.

PROFESSOR JAMES D. BRUCE
ROOM 4-211

Name: _____ Room No. _____

PLEASE RETURN PRIOR TO DECEMBER 20, 1968

December , 1968

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Department of Electrical Engineering

REPLY SHEET FOR MEMORANDUM 2596-GO

○ My assignment as given in Memorandum 2596-GO for the Second Term 1968-69 is satisfactory.

○ I would like to have the following changes made in my assignment for the Second Term 1968-69 as given in Memorandum 2596-GO.

_____

_____

_____

_____

Professor James D. Bruce
Room 4-205

○ My room number is correct as listed in the memorandum.

○ Change my room number to: _____.

○ My extension is correct as listed in the memorandum.

○ Change my extension to: _____.

COMMENTS: _____

_____

_____

_____

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Department of Electrical Engineering

DATE: _____

Please appoint / cancel the appointment of / reappoint

_____

as a Research Assistant / Teaching Assistant for the period

_____ to _____

He will be under the supervision of _____ and

will have an office in _____ with extension _____

The salary of $ _____ per month will be distributed as follows:

_____ % _____

_____ % _____

_____ % _____

* *

GRADUATE OFFICE APPROVAL _____

DATE: _____

* *

Forms TYPED _____

DATE: _____

ELECTRICAL ENGINEERING DEPARTMENT

CHANGE NOTICE

PAYROLL ACCOUNT NUMBER DISTRIBUTION

Employee's name _____ Rank _____

Source _____ Date _____ C/N-No. _____

Reason /Justification _____

Change (s) Requested _____

Effective Date (s) or Period (s) _____

CHANGES

From Previous Status		To New Status	
%	Account No.	%	Account No.

RECORDS REVISION

Assignment book/cards - by M. M. B. ( ) Date entered _____

Assignment book - by J. D. B. ( ) Date entered _____

Dindi sheet _____ _____ ( ) Date entered _____
Month Page

1. One or more fringe benefits;
2. For each benefit, one or more salaries;
3. For each salary, one or more names.

An SPLP program named EXAMPL to accomplish this inversion is given below.

```
          EXTERNAL FUNCTION
          ENTRY TO EXAMPL
          NORMAL MODE IS INTEGER
          BEGIN.
          ROPEN1.($INPUT$,$FILE$)
          WOPEN1.($OUTPUT$,$FILE$)
A         READ1.(EOF)
          NAME.(N,A)
B         READ1.(EOF)
          SALARY.(S,ERROR1)
          READ1.(EOF)
C         FRINGE.(F,ERROR2)
          IN.(3,F,S,N)
          READ1.(EOF)
          NAME.(N,C)
          TRANSFER TO B
EOF       SORT.(3,F,S,N)
NEXT      OUT.(3,X,Y,Z)
          TRANSFER TO EXIT
X         WRITE1.(1,F)
Y         WRITE1.(1,S)
Z         WRITE1.(1,N)
          TRANSFER TO NEXT
EXIT      ENDOUT.
ERROR1    ERRORS.($SALARY$,A)
ERROR2    ERRORS.($FRINGE$,A)
          END OF FUNCTION
```

REFERENCES

1 P. A. Crisman, ed., The Compatible Time Sharing System: a Programmer's Guide, Cambridge, Mass., M.I.T. Press, 1965.

2 Paul R. Halmos, Naive Set Theory, Princeton, D. Van Nostrand Co., 1960.

3 Patrick Suppes, Axiomatic Set Theory, Princeton, D. Van Nostrand Co., 1960.

4 Claude Berge, The Theory of Graphs and Its Applications, London, Methuen and Co., 1962.

5 Arthur A. Bushkin, A Data Storage Structure for On-Line, Multiplexed Information Storage and Retrieval Systems, Unpublished thesis, Department of Electrical Engineering, M.I.T., May, 1967.

6 University of Michigan Computing Center Staff, The MAD Manual, Revised Edition, 1966.

7 Joseph Weizenbaum, "Symmetric List Processor," Communications of the Association for Computing Machinery, vol. VI, no. 9, September 1963, pp. 524-536.