



Princeton Plan-O-Matic

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Motivation

- Long-term academic planning is hard
 - Departments and programs have complicated requirements
 - No centralized mechanism for experimentation
- Current systems inadequate
 - SCORE / Degree Progress Report
 - Student Course Guide



Princeton Plan-O-Matic

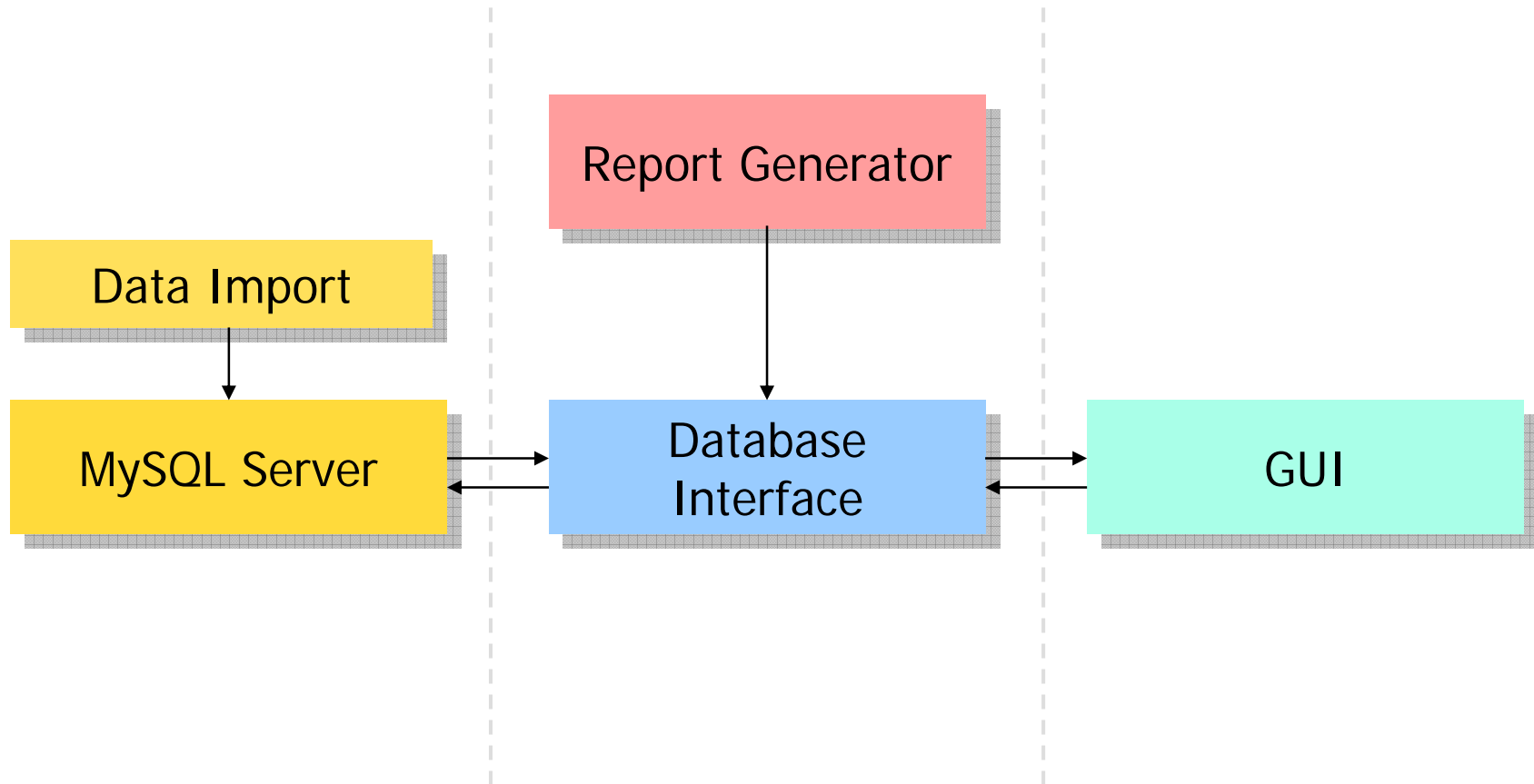
- A tool for students and advisors to explore possible 4-year schedules
- Major features:
 - Easy access to degree, major, program, and other requirements
 - Immediate feedback
 - Simple, visually driven interface
 - Experiment with multiple schedules



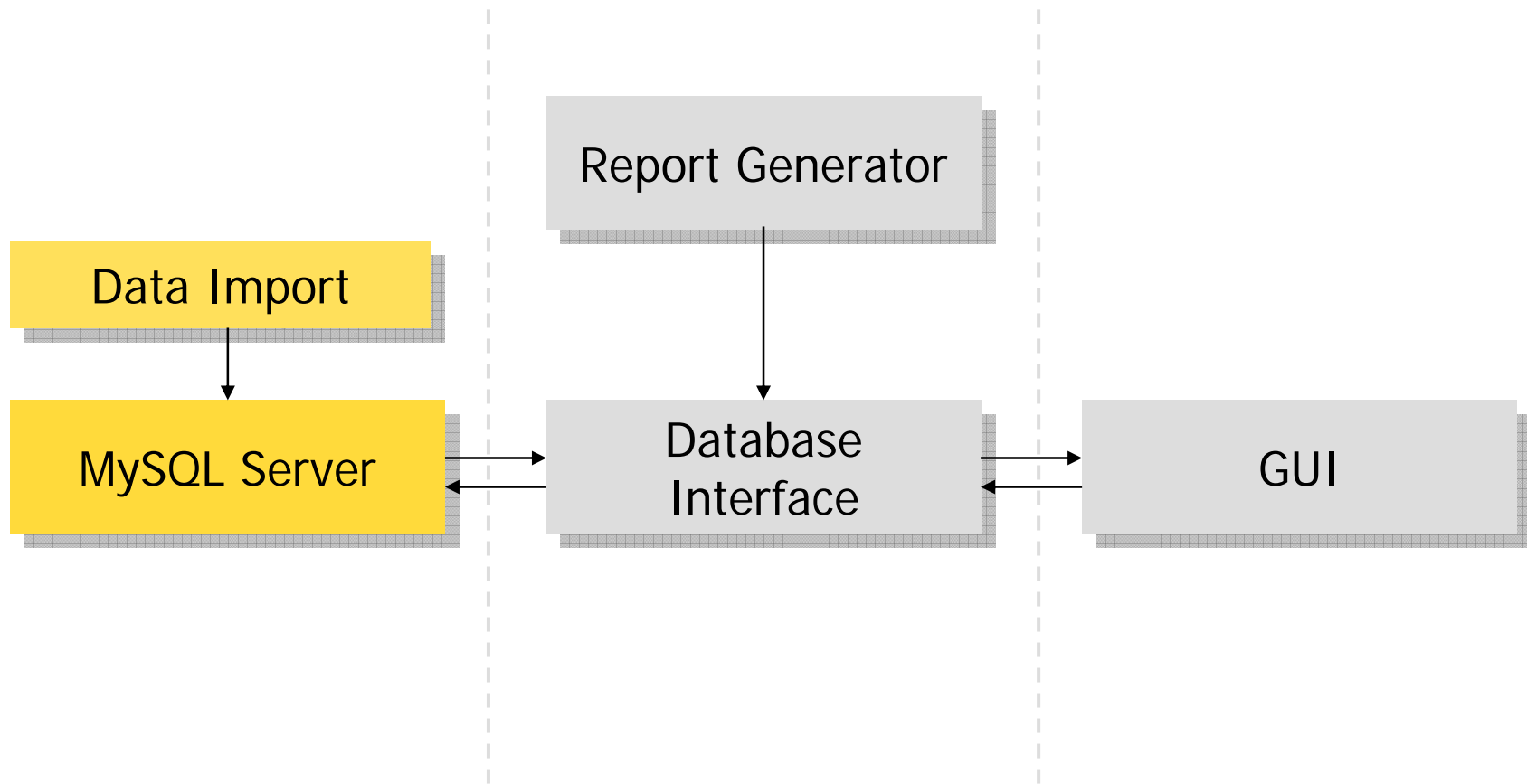
Demo

- Princeton Plan-O-Matic

Architecture Overview



Back-end



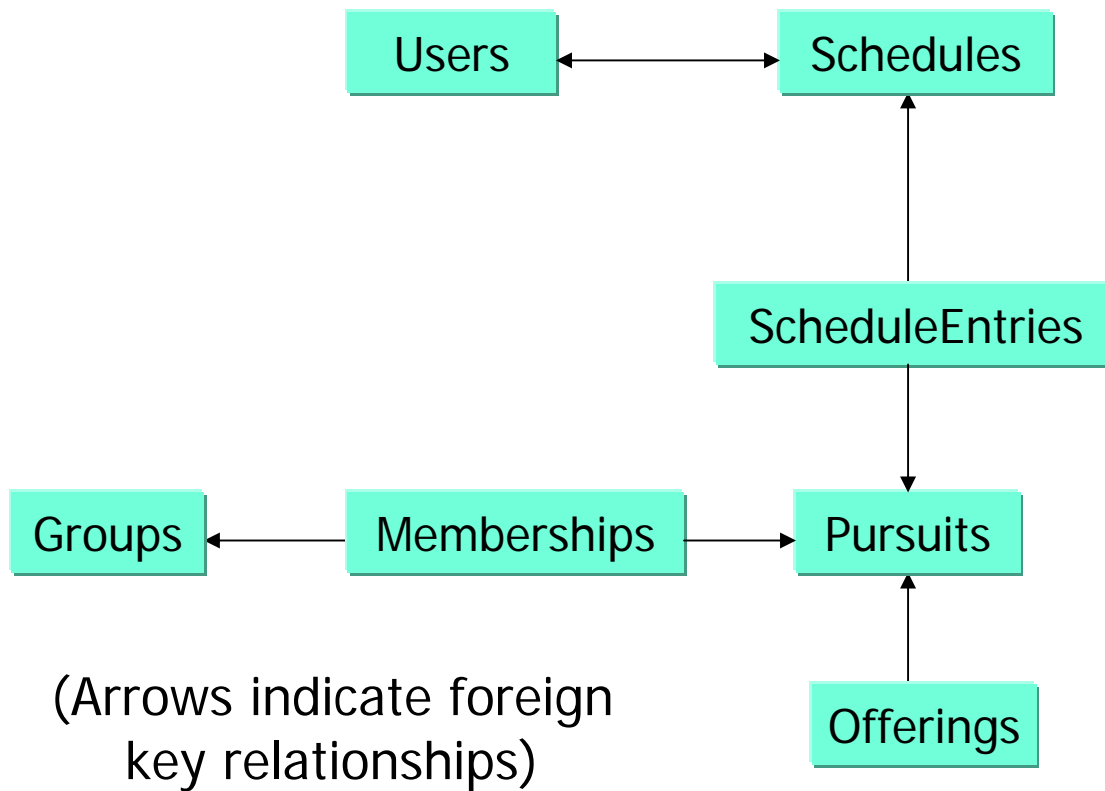


Data Import

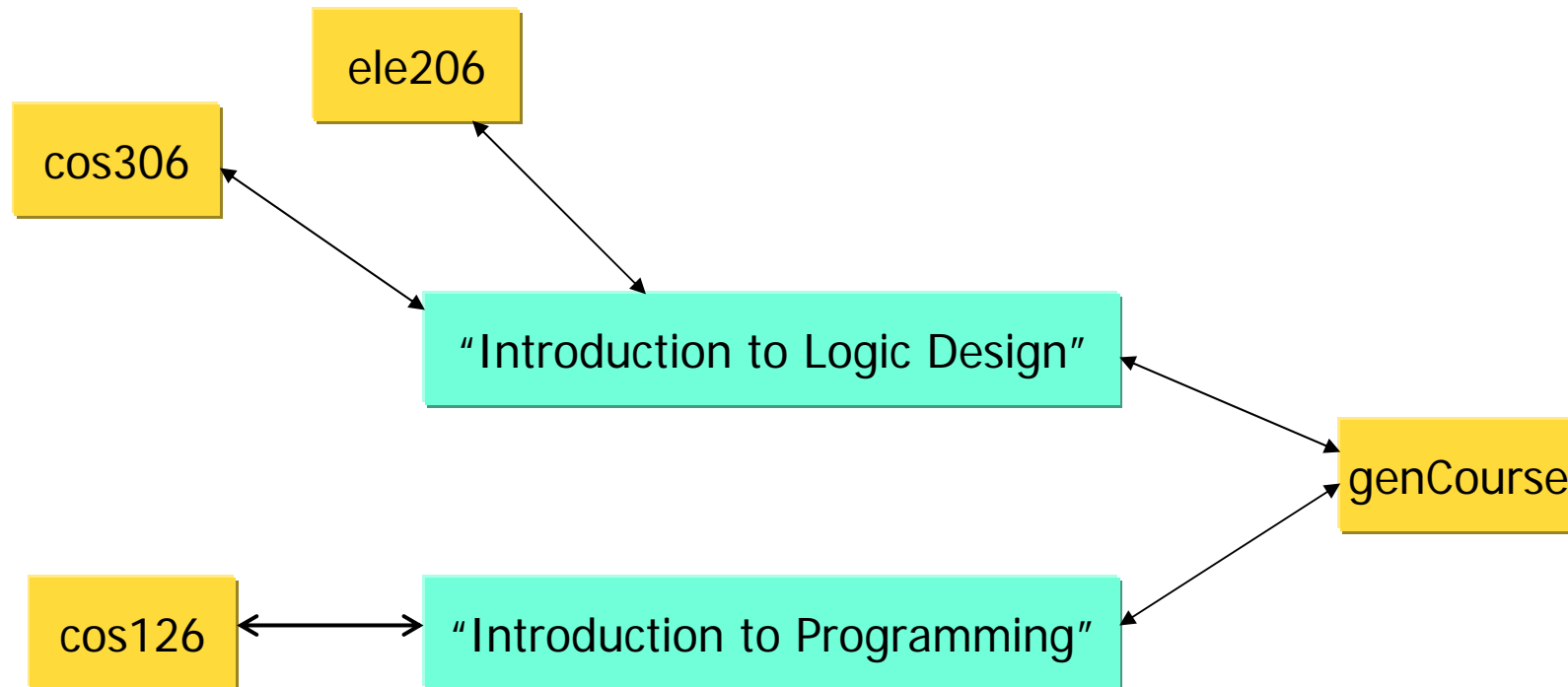
- Course information downloaded from registrar
- Manually specified program requirements
- Automated database build and update



Database Structure

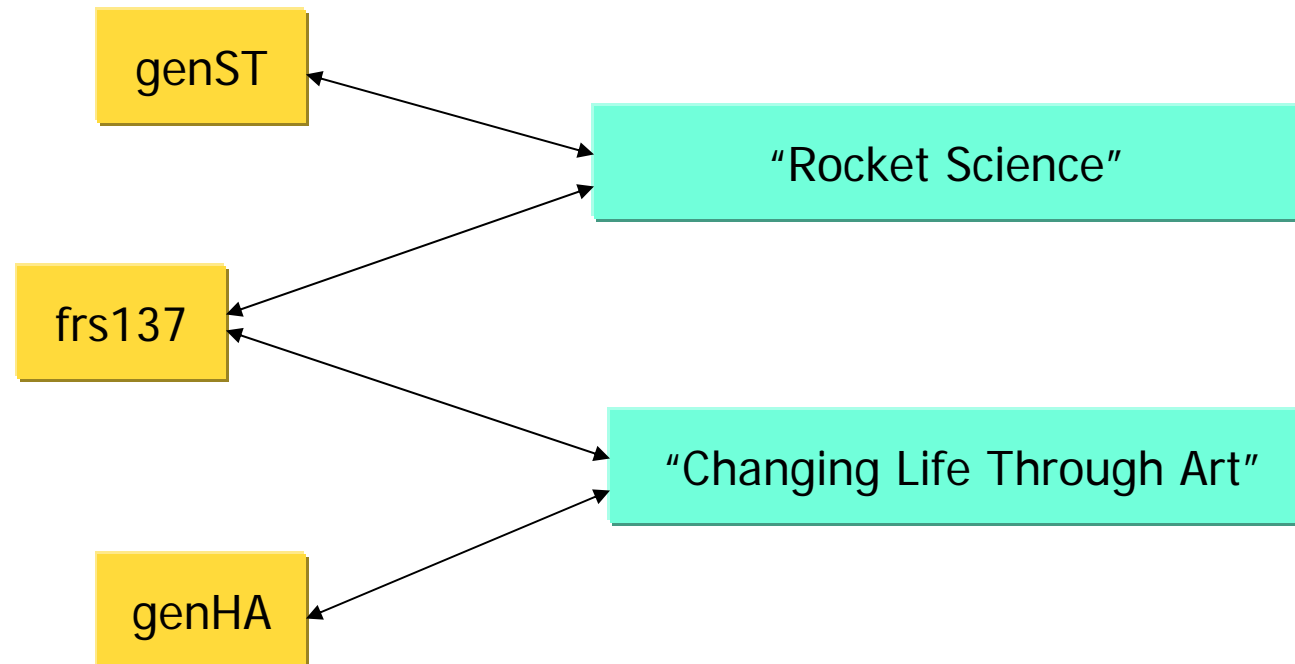


Example: Cross-listings



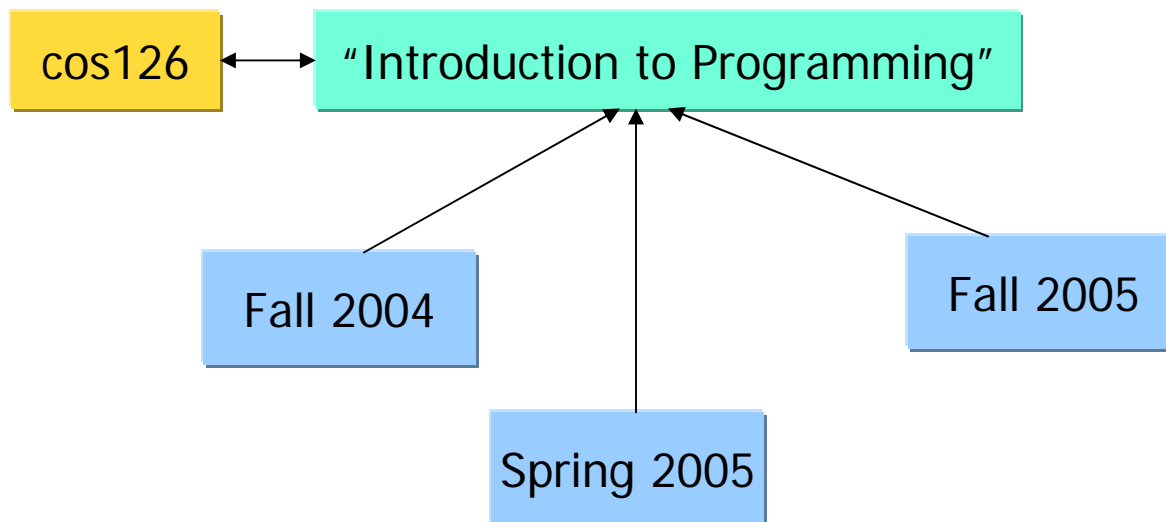


Example: Course Codes



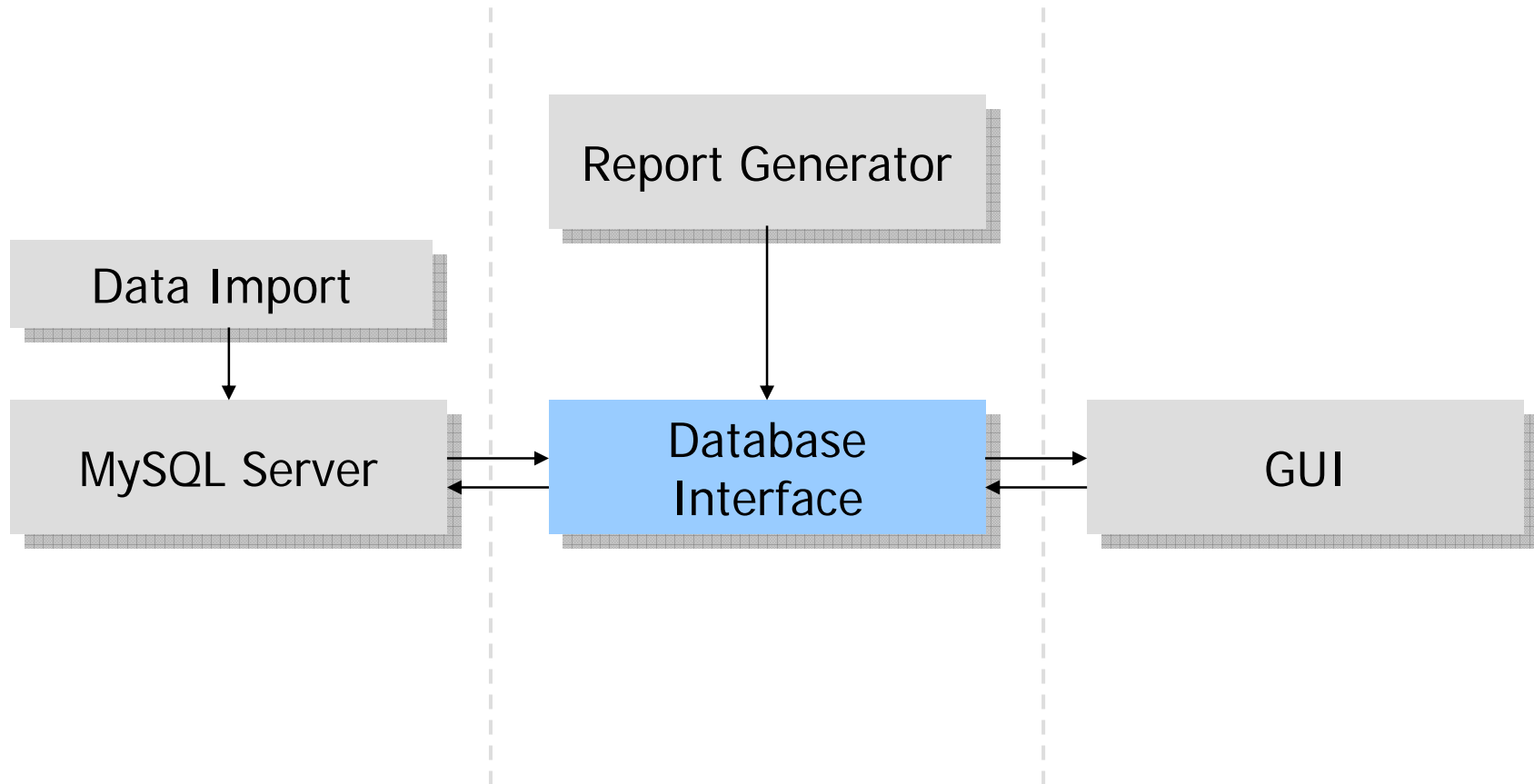


Example: Multiple Offerings





Database Interface





Database Interface

- Object-oriented (PHP)
- Abstract all interaction with database
- Process user login
- Search implementation

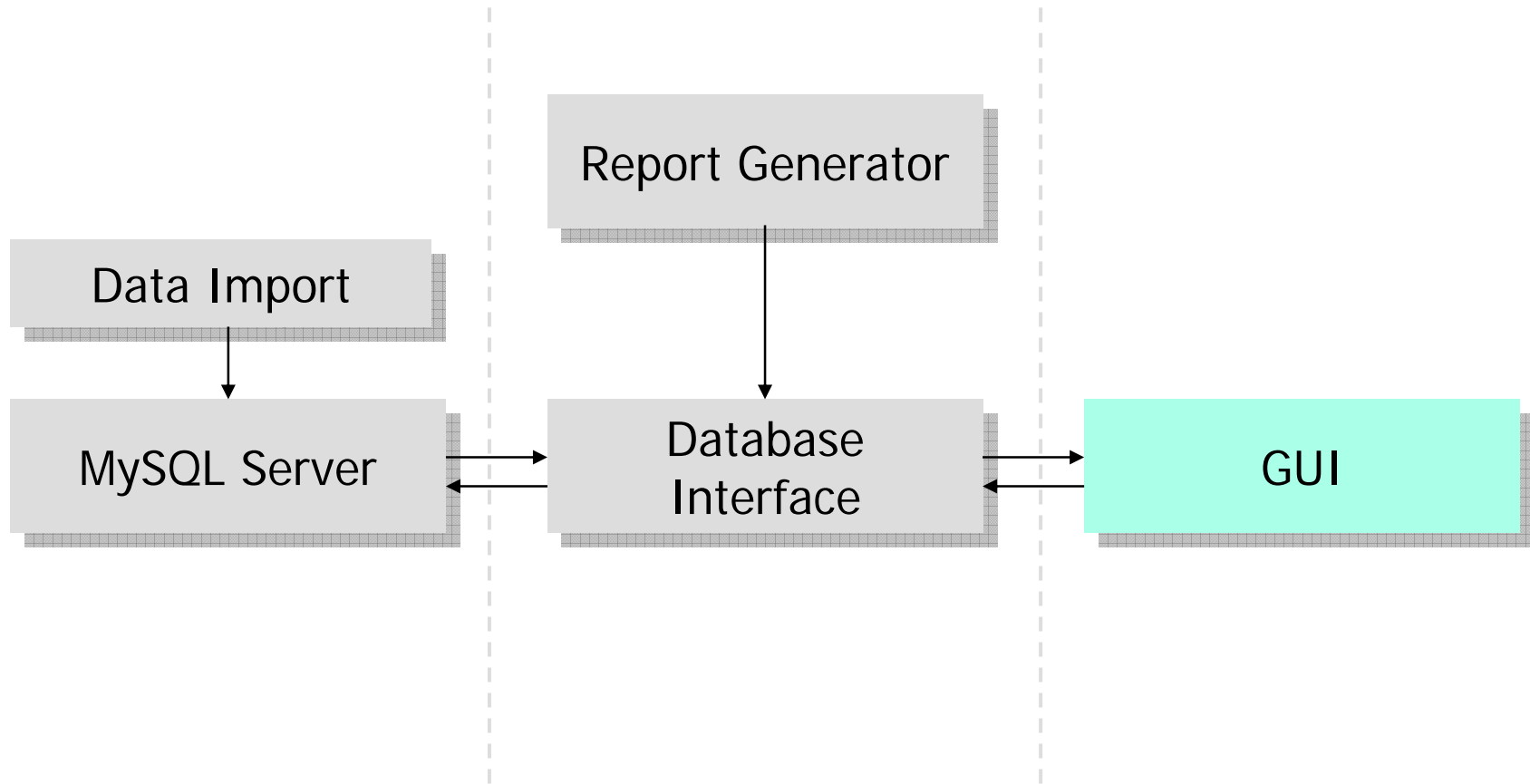


Interface Classes

- User, Group, Pursuit, Schedule, Semester, PursuitSearch
- Store primary key of corresponding database row



GUI

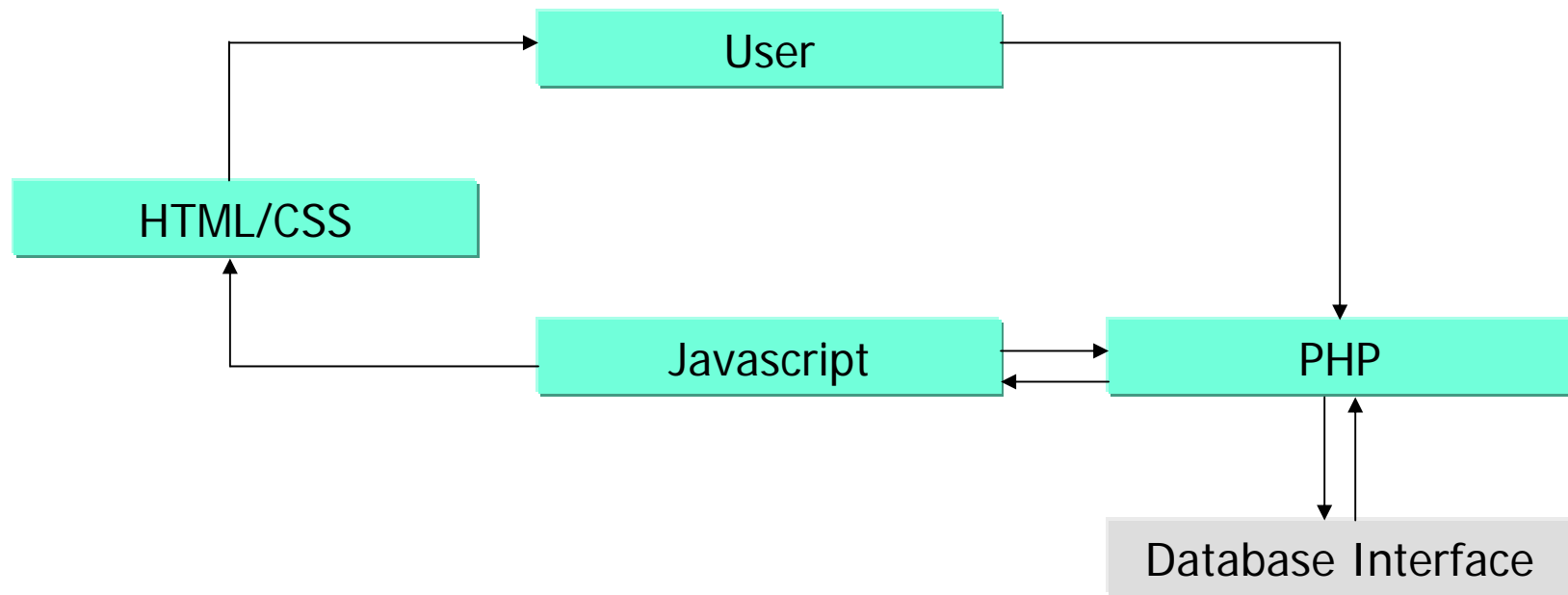




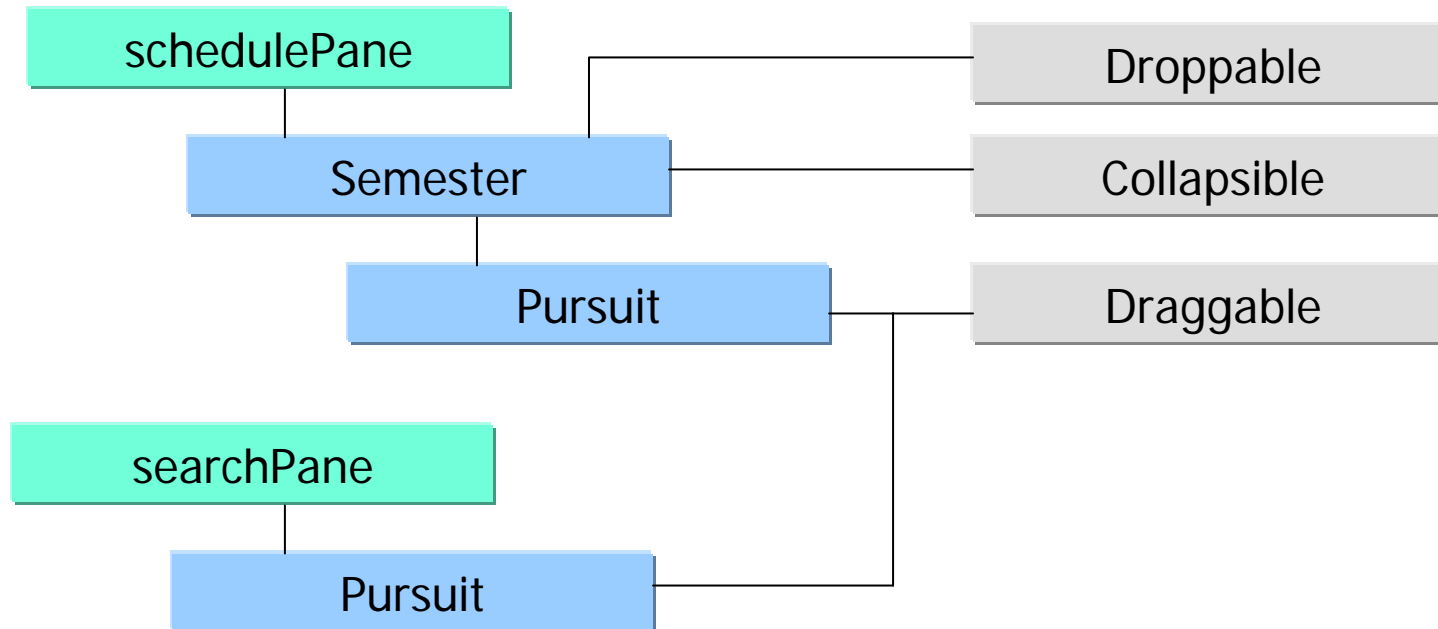
GUI Design & Implementation

- Design Goals
 - Intuitive, easy to use
 - Display lots of information in clear manner
 - Visually appealing across browsers
- Implementation Goals
 - Efficiency
 - Maintainable, Modular

Overview of Data Flow

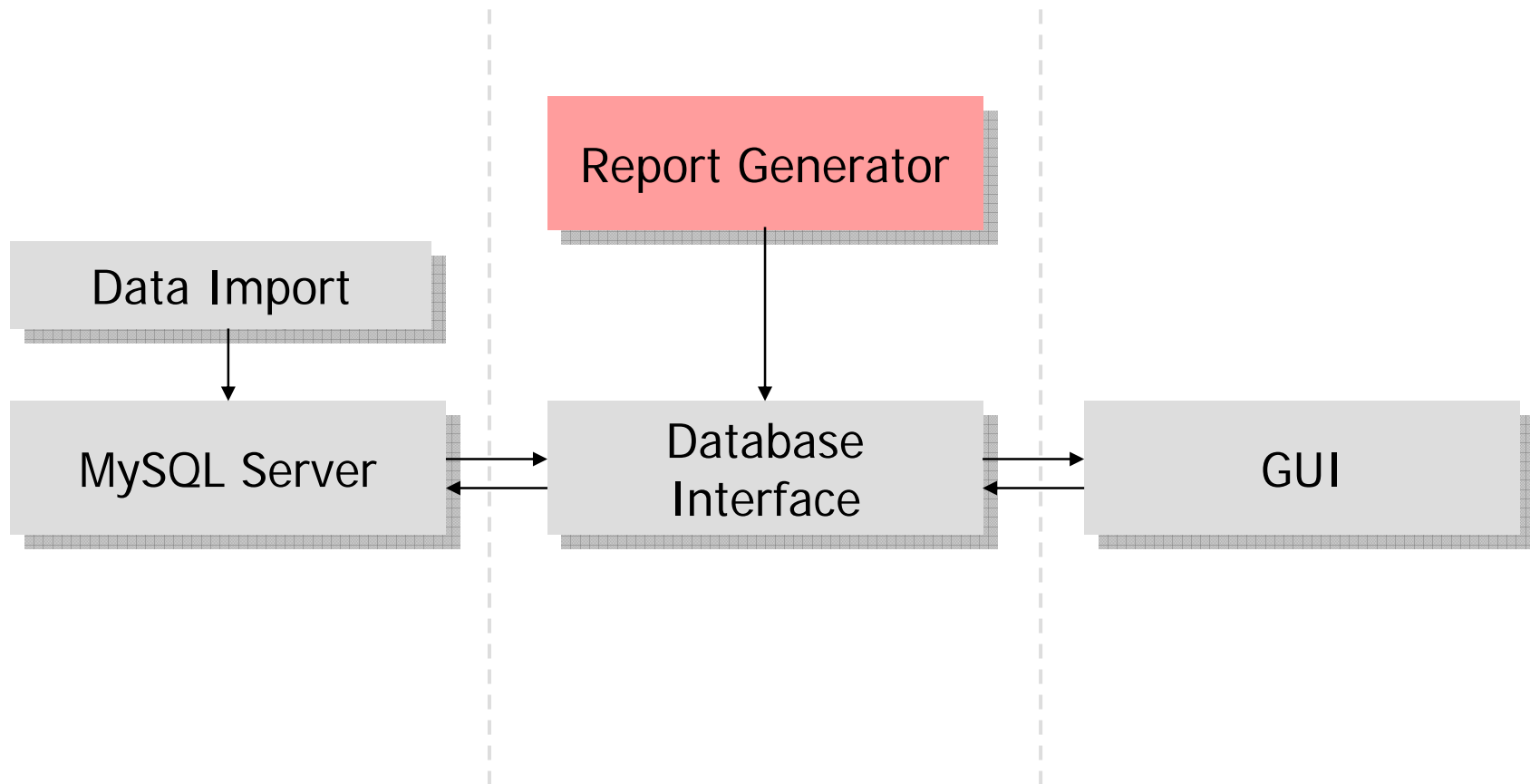


Implementation Details





Report Generator





Prerequisite Expressions

- “PHY 103 and PHY 104 are prerequisites, MAT 203 is a corequisite.”

phy103 & phy104 & mat203 \$ same

- “Three HA courses and five ST or STX courses.”

3 @ genHA & 5 @ (genST, genSTX)

- “Three courses distributed among four areas of concentration (no more than one course from each area may count towards the total of three).”

3 @ (1 % cheBio, 1 % cheEnt, 1 % cheEnv, 1 % cheMat)



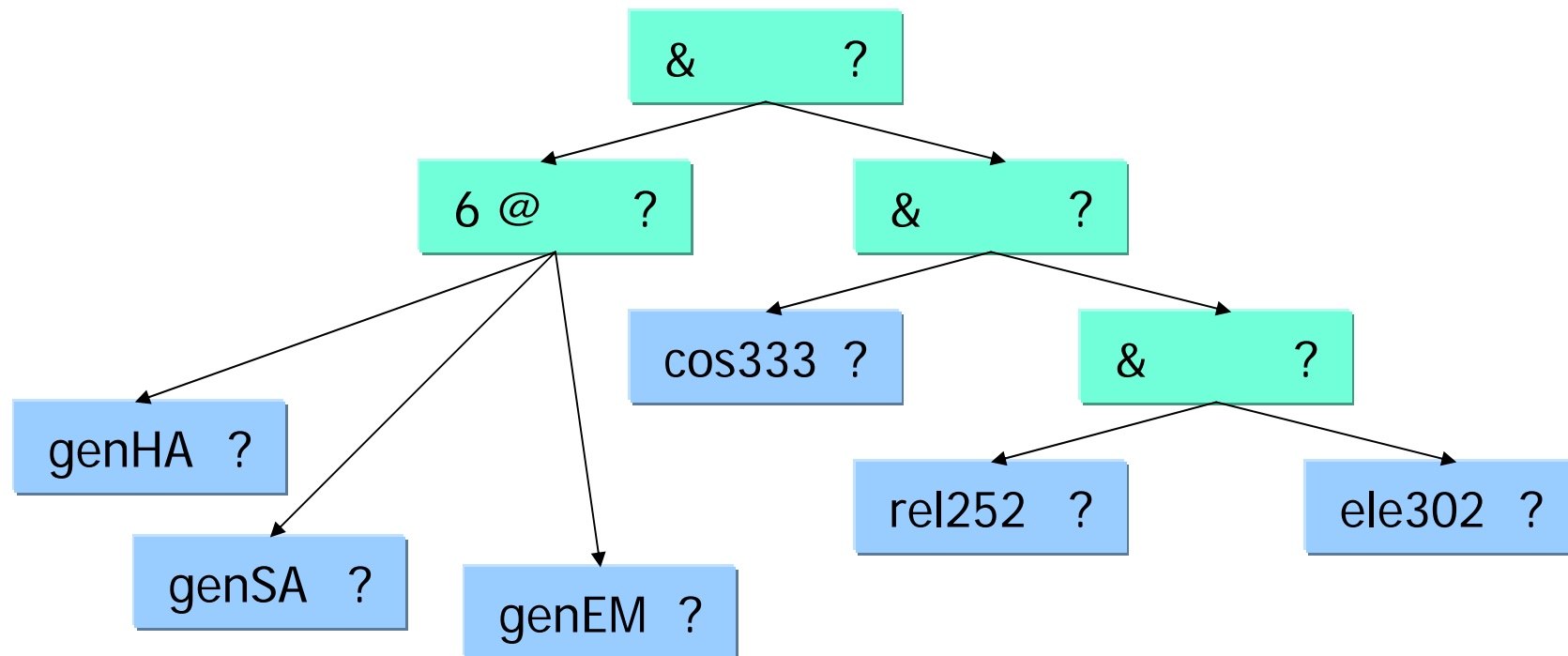
Prex (PRerequisite EXpression) Parsing

6 @ (genHA, genSA, genEM) ; cos333 & rel252 & ele302

- "Six courses from three distribution areas, as well as three specific other courses."
- Suppose you have taken COS 333 as well as one SA course and three HA courses
- Operators are ; & | @ % \$

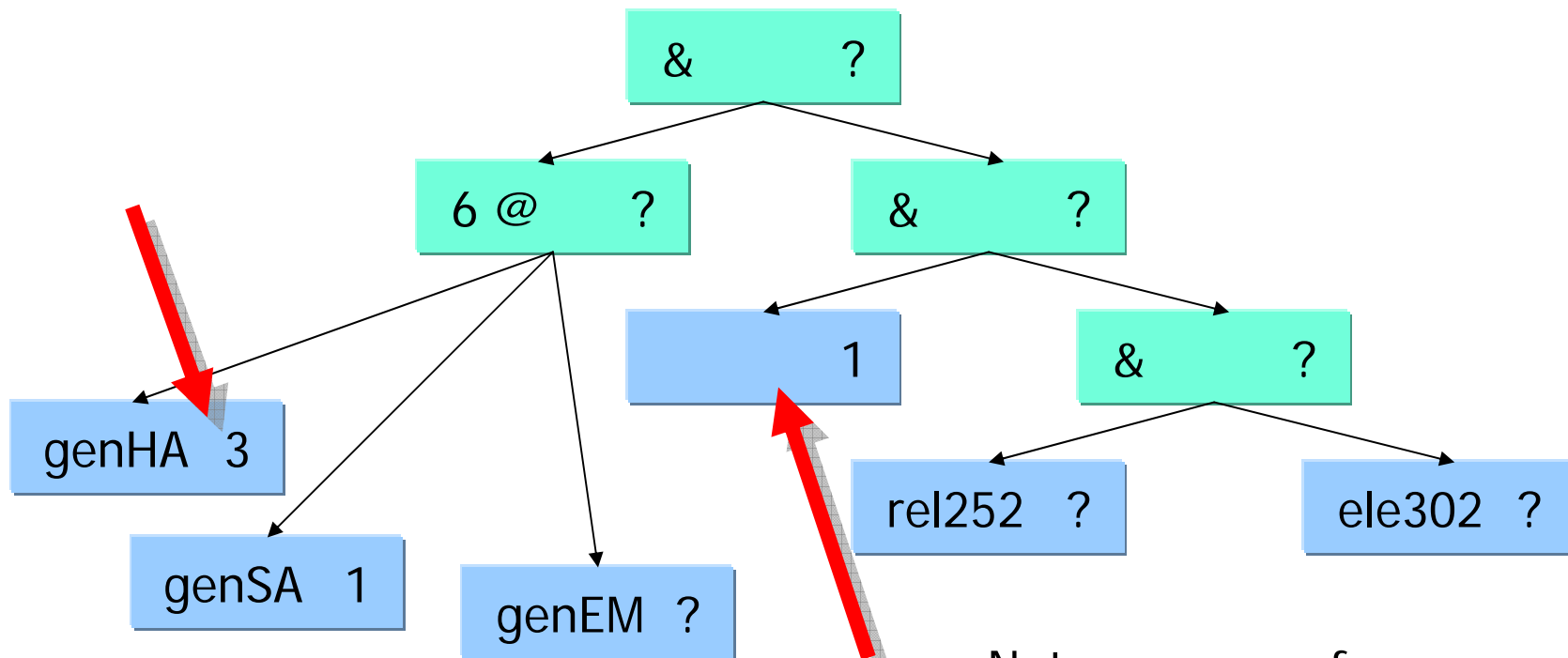
Initial Parse Tree

6 @ (genHA, genSA, genEM) & ((rel252 & ele302) & cos333)



After credits resolved

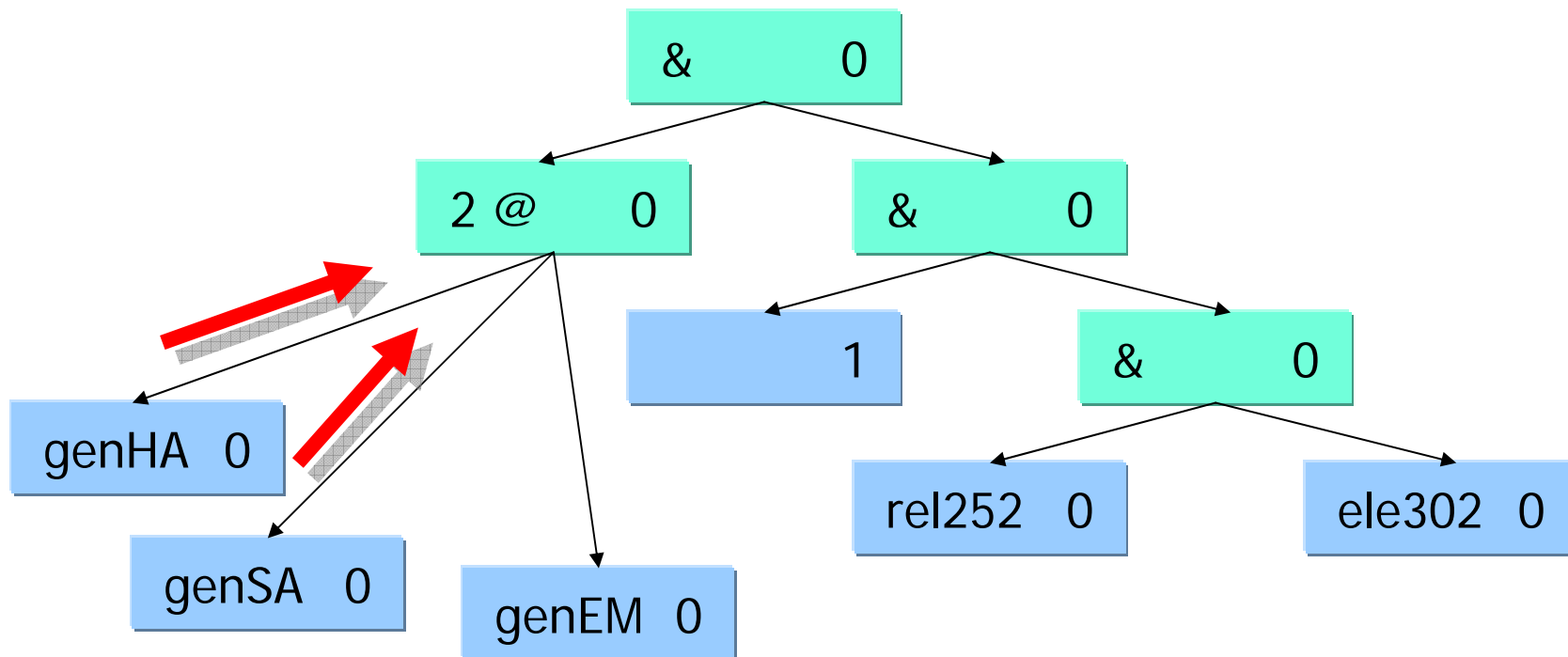
6 @ (genHA=3, genSA=1, genEM) & ((rel252 & ele302) & 1)



Note: course references disappear, groups stay

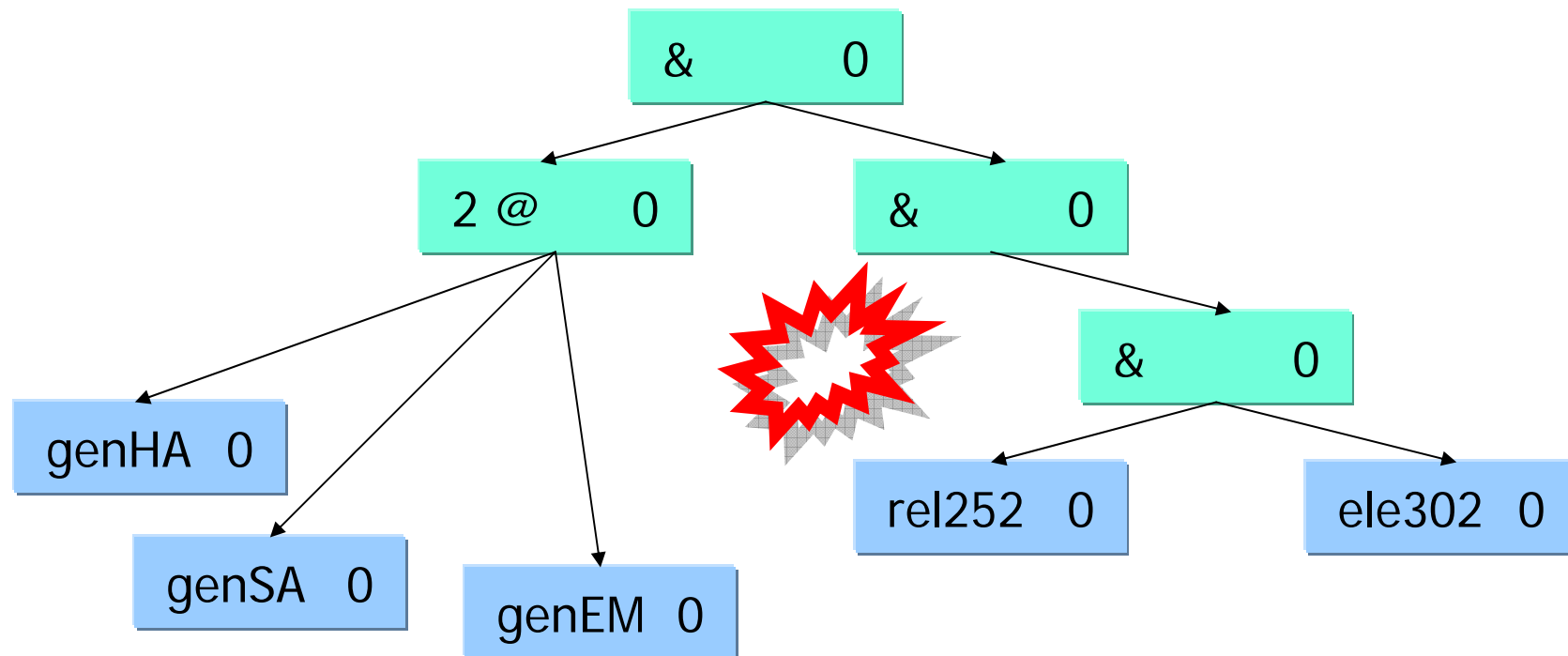
Bubble up constant terms

$2 @ (\text{genHA}, \text{genSA}, \text{genEM}) \& ((\text{rel252} \& \text{ele302}) \& 1)$



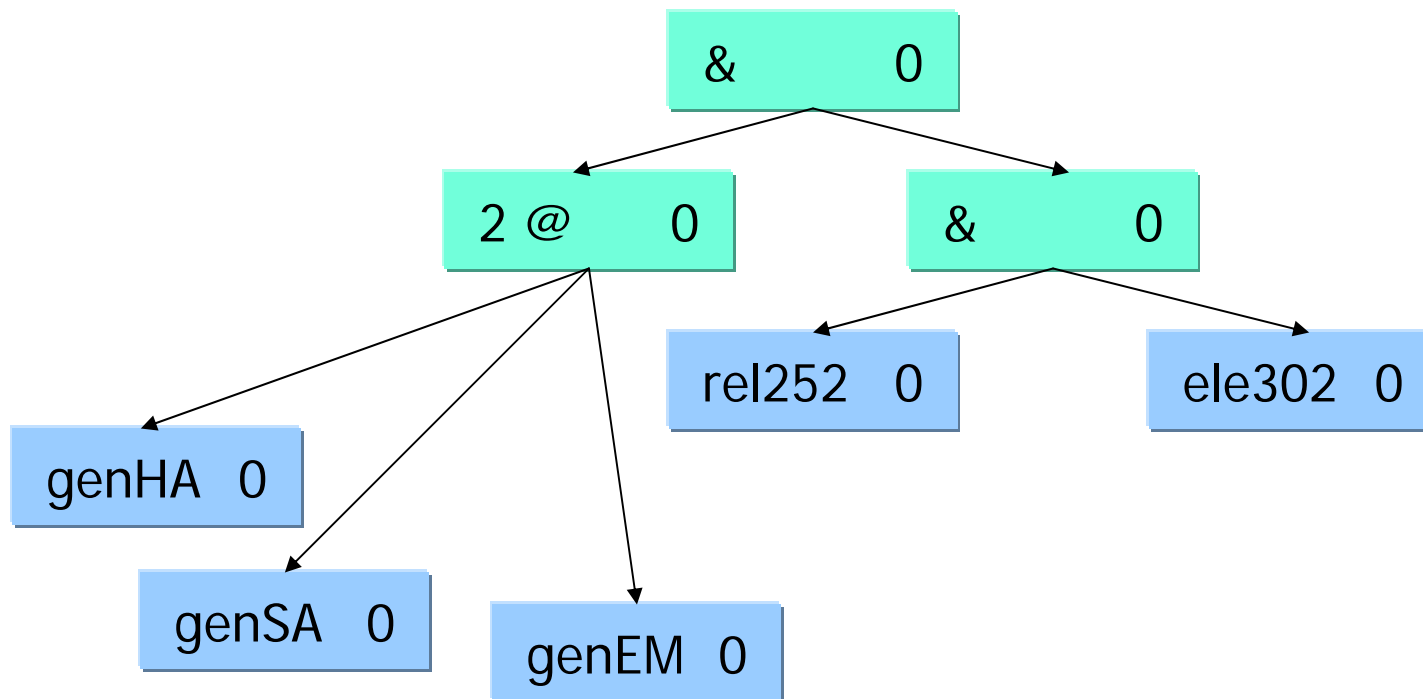
Eliminate fulfilled branches

2 @ (genHA, genSA, genEM) & ((rel252 & ele302) &)



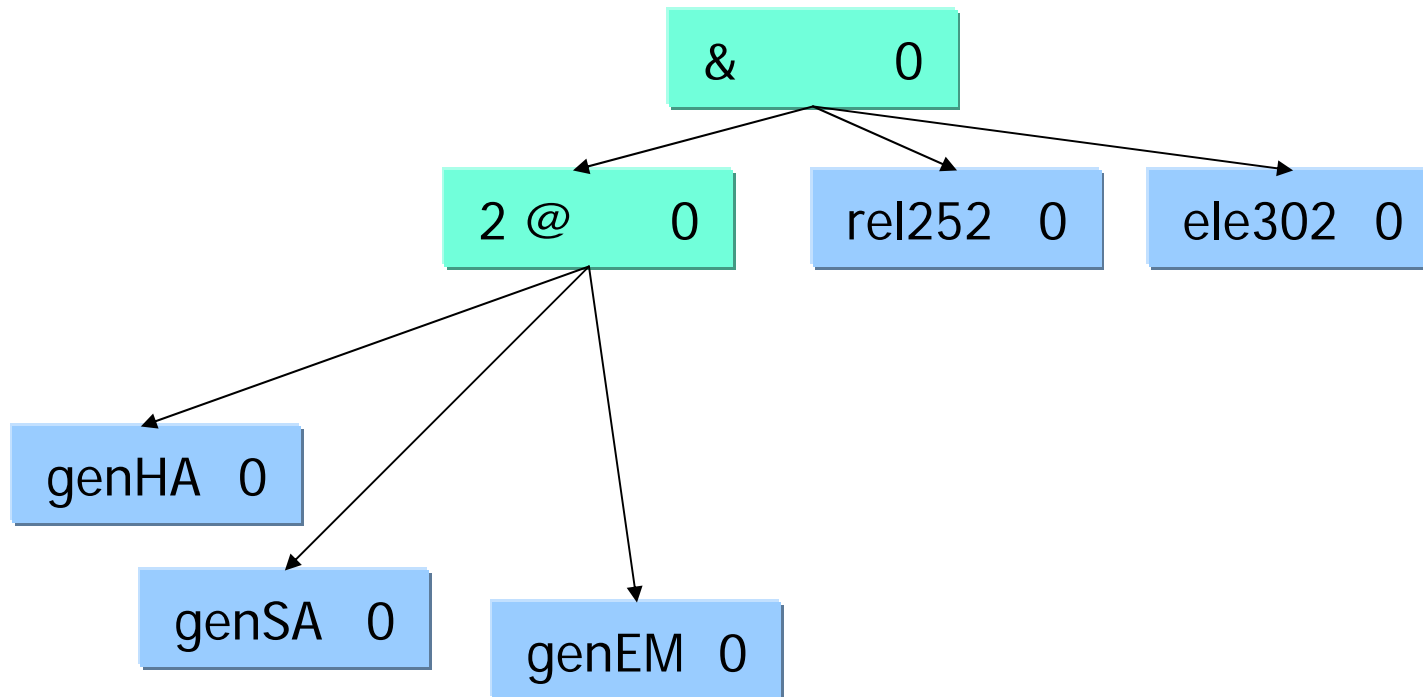
Collapse associative chains

2 @ (genHA, genSA, genEM) & (rel252 & ele302)



Collapse associative chains

2 @ (genHA, genSA, genEM) & rel252 & ele302





Presentation

2 @ (genHA, genSA, genEM) & rel252 & ele302

☐ Freshman Spring '05

☐ AAS 209/ENG 209 (S04-05)

Introduction to African-American Literature: Harlem Renaissance to Present

Each of the following:

- ele302
- At least 2 of genHA, genSA, genEM
- rel252



Possible Features

- Warn about time conflicts
- Generic courses
- User override
- Helpful course suggestions
- Search for nearly satisfied programs
- Link to Student Course Guide reviews



Fun Facts

- Languages used: awk, Java, Javascript, PHP, C, yacc, HTML, CSS, bash, SQL
- Current lines of code:
 - >1000 interfaces, >1500 GUI, >1000 import, >1300 report generator
- Database:
 - 2508 pursuits, 3542 groups, 8672 memberships
- SVN commits:
 - 310 revisions (34/week avg.)
- ...Questions?