

Worksheet 17: Michael Collins

1. Assume you have the `NAMED-OBJECT` and `THING` classes defined as in `OBJTYPES.SCM` for the project. Define a new class `PERSON` which inherits from the `THING` class. It should have an additional state variable, `AGE`. When created, we should state the person's name, age and location, for example:

```
(define mike (create-person 'mike 21 G484))
```

creates a `mike` object with his correct age, and location `G484` (assuming that `G484` has previously been defined as a location). The `PERSON` class should have additional methods `age?` and `have-birthday`. The method `age?` returns the age of the object, `have-birthday` increments the age by 1 year, and returns the new age.

2. Next, create a new `BUILDING` class, where:

- The `BUILDING` class inherits directly from the `NAMED-OBJECT` class.
- The internal state variables for the building are a `name`, an `x-coordinate`, a `y-coordinate`, and an `architect` variable which is of the `PERSON` type.
- The class should contain methods for: `X-COORD`, `Y-COORD`, `SET-X!`, `SET-Y!`, `ARCHITECT-NAME`. In addition the class should have a method `DESCRIBE` which prints "I am the `<name>` building, located at (`<x-coordinate>`, `<y-coordinate>`)". As a final point, `SET-X!` and `SET-Y!` should be implemented so that they change the coordinate, then make a call to `DESCRIBE`.

2. Now create a `GEHRY-BUILDING` class. It should have the `BUILDING` class as its superclass. These objects always have `gehry` (a previously defined person) as their architect. The new class should have a `z-coordinate` as an additional internal variable (Gehry buildings seem to have an additional piece of uncertainty concerning their location). Another internal variable, initially set to 0, is `num-fire-alarm-tests`. It has an additional method `TEST-FIRE-ALARM` which displays a message “Testing fire alarm” and increments the `num-fire-alarm-tests` variable. The `DESCRIBE` method should behave the same way as for the `BUILDING` class, but in addition it should report the z-coordinate, the number of fire alarm tests, followed by a line “I was designed by a famous architect.” What happens if the `SET-X!` or `SET-Y!` methods are used?