

Narissa Tsuboi
10/13/2021
CPSC 5011-01, Riley

Homework 3: Design A Class Registration System

A. Problem Statement

“On SU Online, students are able to search and register for classes. In order to add a course, students need to meet the prerequisites and the class may not be full. Students may also drop a class they decide not to take before the registration deadline. Students can only take a maximum of 18 credits if undergrad or 12 credits if grad student.

Students must be logged into SU Online before attempting to add or drop, but can search for classes either logged in or not. If the class is full, students must send an email to their advisor with their name, SUID, and the course they want to take; students will be put on a waitlist for the requested course. If space allows, students will be automatically enrolled in the order they are listed on the waitlist.”

Assumptions

- A class and course are interchangeable.
- Emailing the advisor takes place outside of the SUOnline System and should be ignored.
- Every student account can access their own completed course list.

B. List of Use Cases

- A student can search for and register for classes.
- A student can enroll in a class.
- A student can drop a class.
- A student can search for classes.
- A class can be full or not full.
- A student can be an undergraduate or a graduate student.
- A student can log into SU Online.
- A student can be enrolled from a waitlist.
- An advisor can enroll waitlisted students.
- A student can enroll in up to a specific number of credits.
- A class has prerequisites.
- SU Online has a registration deadline.
- A student has a name and SUID.
- A student is an undergraduate student or a graduate student.
- A class is full or not full.

C. Analysis of “probably classes”, “possibly classes”, and “rejected as classes”.

“Probably classes”

- SUOnline – The system itself needs a class so it can be instantiated with a registration deadline and collection of classes.
- Student – The primary user. A user is typically required.
- Advisor – The secondary user.
- Class – The object students can enroll in and advisors can waitlist students in (Interchangeable with course, not separate).
- Waitlist – A waitlist is a subclass from a Class.

“Possibly classes”

- Undergraduate student/graduate student – If inheritance relationship was desired, these classes could be children of Student class. However, per class lecture, inheritance is being used less in object-oriented design. This type of Student can be differentiated within the Student class itself as a field.

“Rejected as classes”

- Name, SUID, registration deadline, and credits – Do not perform an action, member field instead.
- Prerequisites – For simplicity, assume prerequisites are simple data fields, not a robust class of its own.
- Name – Does not perform an action, member field instead.

D. Relationships Between Classes

- SUOnline holds-a collection of Classes.
- An undergraduate is-a Student and inherits the properties of the Student class. Its variation comes from the maximum credits allowable (18). A graduate student is-a Student and inherits the properties of the Student class. Its variation comes from the maximum credits allowable (12). Typically composition (has-a) is preferred over inheritance (Budd, p. 177). However, a Graduate Student is a type of Student, and we can use inheritance to reuse code and extend the child classes quite easily so inheritance was used.
- A Class holds-a Waitlist. The Class contains a Waitlist and is dependent on the existence of the class.
- An advisor holds-a collection of Student. Is of which they can enroll from the Waitlist.

SUOnline

- holds-a-registration-deadline
- holds-a-collection-of-classes
- login-authorized-students
- login-authorized-advisors
- search-classes

- Student
- Advisor
- Class

Interface

Student

Undergraduate, Graduate

- has-a-name
- has-a-student-id
- has-a-completed-course-list
- is-registered-flag

- Undergraduate
- Graduate

Undergraduate

Student

- has-a-max-credit-limit

- Student
- Advisor
- Class

Graduate

Student

- has-a-max-credit-limit

- Student
- Advisor
- Class

Class

Waitlist

- has-credits
- compare-prerequisites-with-student-course-list
- enrolls-students
- drops-students
- waitlists-students
- is-full

- Student
- Advisor

Waitlist

Class

- holds-a-list-of-waitlisted-students-in-queue

- Class

Advisor	
<ul style="list-style-type: none">waitlist-studentsremove-students-from-waitlist	<ul style="list-style-type: none">Class