

# CS 5200 Database Management System

## Assignment 1

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### 1. Nouns

**User:** username, password, first name, last name, e-mails, phones, addresses

**Faculty:** benefits, tenure status, parking, banking info

**Students:** graduate/undergraduate, financial aid, work-study, scholarship, GPA

**Courses:** modules

**Modules:** lessons

**Sections:** instructor, TAs, capacity

#### **Student Progress**

**Widgets:** YouTube videos, slides, text documents, raw HTML, etc.

**Evaluation widgets:** essay, submission, exam

**Exam:** essay, multiple choice, fill in the blanks, etc.

**Semester:** spring, full summer, summer 1, summer 2, fall

#### **Registrar's office**

**Enrollment:** final grade, letter grade, feedback

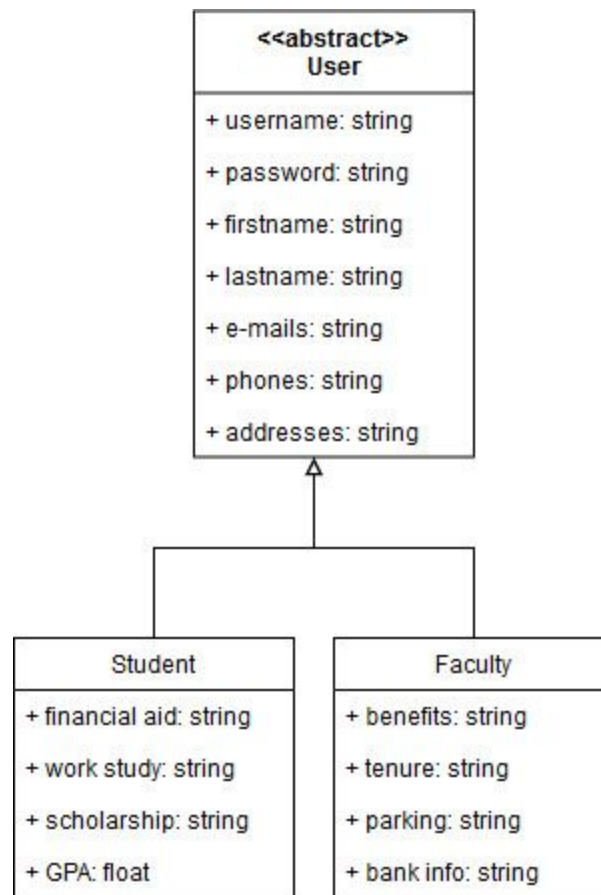
**Grades:** assignments, exams

### 2. Verbs

Provide, author, create, share, contain, broken up, build, evaluate, have, enroll, answer, verify, update, give, teach, register, review

### 3. Generalization/Specialization, Inheritance

Students and faculties share similar attributes such as username, password, first name, last name, emails, phones, and addresses. Both these classes have attributes unique to themselves. Thus, the User class is a generalization of Students/Faculties and Students/Faculties are specializations of the User class.



#### 4. Associations, aggregation and composition

An association is a connection between two classes. Verbs in the statement that declare the nature of the relationship can be considered as an association.

e.g. “students enroll in sections” specifies an association between student and section.

A composition is one wherein, there exists a strong life cycle dependency between the two classes. If a container class is removed, the parts are automatically invalidated. An aggregation has individual moving parts that can exist without the container.

In this problem, “courses contain modules”, “modules contains lessons”, “widgets build lessons” identify several compositions. The classes “registrar office” and “faculty” appear to be an aggregation (since the faculty class has an individual life-cycle).

## **5. Classes vs Attributes**

Evaluation, is better modelled as a class. Although an evaluation can be enumerated, it makes more sense that it has the room for holding variables that are intrinsic to the type of evaluation.

Classes such as GPA would be better modelled as attributes.

## **6. Data types**

The data types of each entity are described in the final diagram.

## **7. Cardinality**

Cardinality is described in the final diagram.

## **8. Inadequate/Redundant relations**

Faculty to courses relationship is redundant because the course description already has faculty information available.

The relationships between student, section, student progress, grade can be restructured.

## **9. Reify**

Faculty-courses relationship was removed. The student, section, student progress, grade relationships were rearranged to maintain minimal dependence between classes.