General Requirement

Introduction:

- Within the framework of a student enrollment management system, this document describes the needs for a database system.
- Enrollment procedures, departments, courses, and student administration will all be managed effectively thanks to this system.

Business Rules:

1. student may sign up for more than one course.
2. There can be more than one student registered in a course.
3. A department must be connected to a course.
4. A department may provide more than one course.
5. A unique student ID is required for every student.
6. A unique course ID is required for every course.
7. A unique department ID is required for every department.
8. Only courses given by their connected department are available for enrollment by students.
9. Only if there are seats available in a course can a student enroll.
10. Enrollment in courses must be limited to a minimum and maximum.
11. Only those with permissions can add, edit, or remove records from the database.

List of Possible Nouns and Actions:

Student:

- **Nouns:**

1. Student
2. Student ID
3. Name
4. Email
5. Department ID

- **Actions and verbs:**

1. Add a new student
2. Edit student details
3. Delete a student
4. View student information
5. Enroll in a course
6. Withdraw from a course

Enrollment:

- **Nouns:**

1. Enrollment

2. Student ID
3. Course ID
4. dept_id
5. Enrollment Date

- **Actions:**

1. Enroll a student in a course
2. Withdraw a student from a course
3. View enrollment details

Course:

- **Nouns:**

1. Course
2. Course ID
3. Name
4. Credit Hours
5. Department ID
6. Capacity

- **Actions:**

1. Add a new course
2. Edit course details
3. Delete a course
4. View course information
5. Check available seats

Department:

- **Nouns:**

1. Department
2. Department ID
3. Name

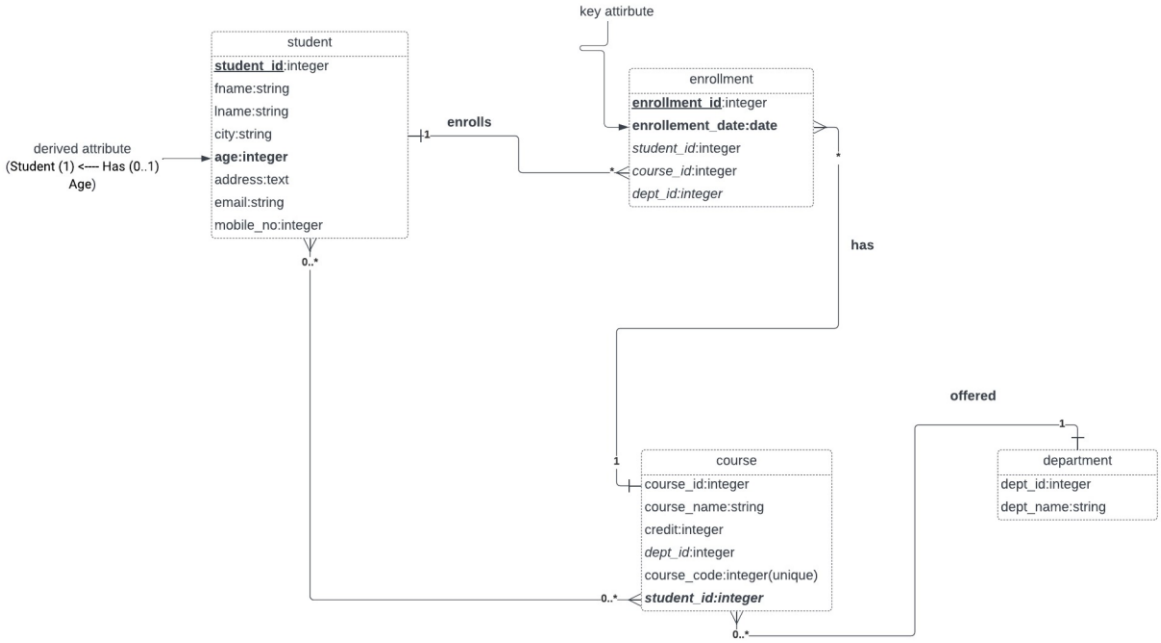
- **Actions:**

1. Add a new department
2. Edit department details
3. Delete a department
4. View department information

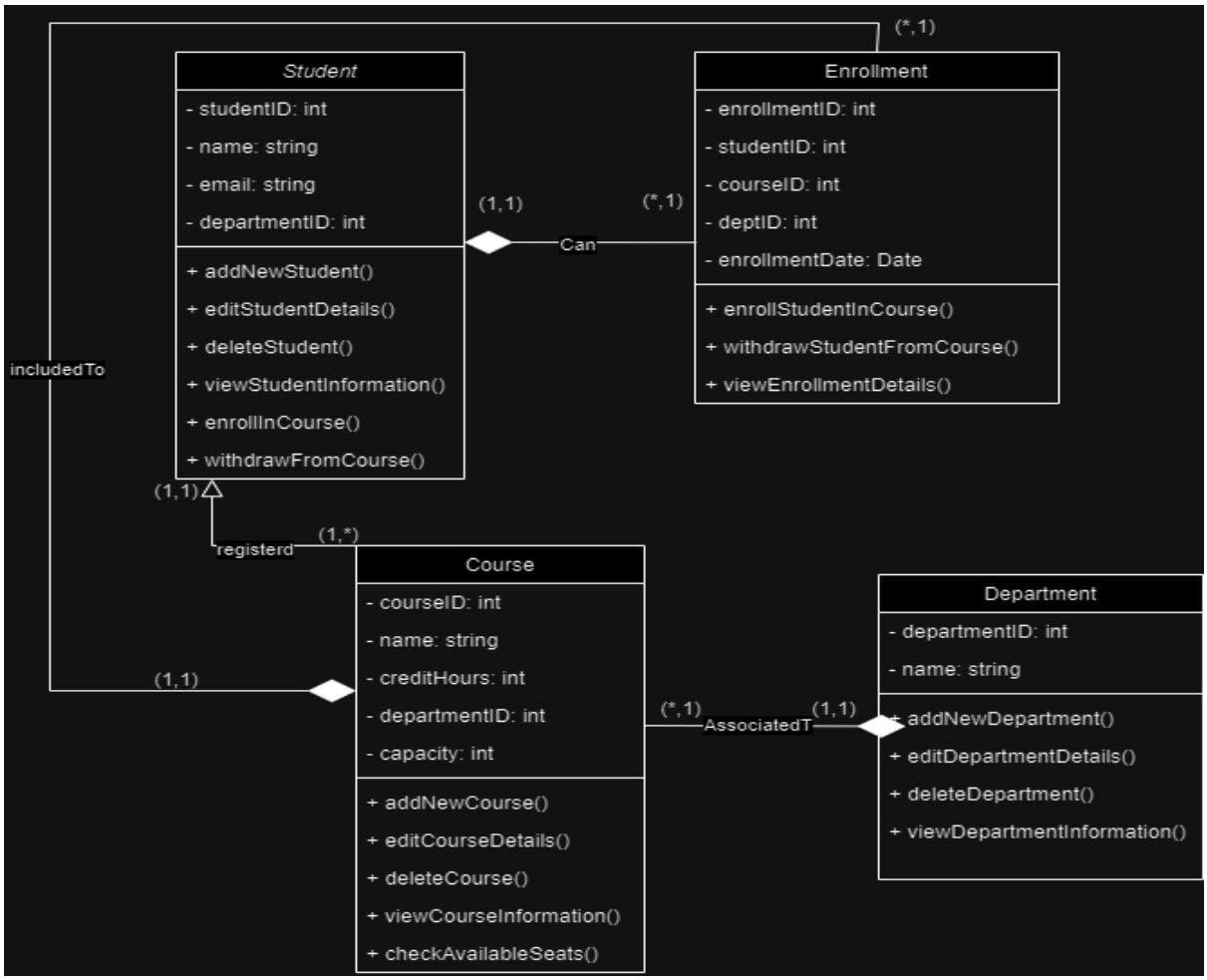
- **Prospective Improvements**

  - ✓ Integration for online enrollment and course registration through a student portal or web-based platform.
  - ✓ The system's expansion to include features for gradekeeping, faculty management, and course evaluation.

UML Class Diagram:



UML Diagram with function also:



In-Memory Key-Value Storage:

- Utilize an in-memory key-value storage system for efficient data retrieval.
- Use student ID as the key for student information.
- Use course code as the key for course information.

Use a data structure (e.g., a hashmap) to store objects of Student and Course classes.

Keys:

For Student: Student ID
For Course: Course Code

Values:

For Student: Instance of the Student class
For Course: Instance of the Course class