

Assignment 3

Northeastern University

INFO 5100 - Application Engineering and Development

Report : University Ranking System

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1. Aim

1.1. Purpose

The purpose of this document is to present a detailed description of the application. It will explain the purpose, features, and interfaces of the application. It will also describe what the software will do (and its potential enhancements). This document is intended for users of the application and potential developers.

1.2. Product Scope

The application is being developed for the university administrators and users online who are interested in comparing universities, colleges, departments, programs, courses and faculties available based on certain metrics like rate of graduation, placement, promotion over a period. It provides a performance measurement solution to enable users to understand and measure the quality of the education delivered to students. Users can also use this information to decide which university/program/course/professor to select for their education.

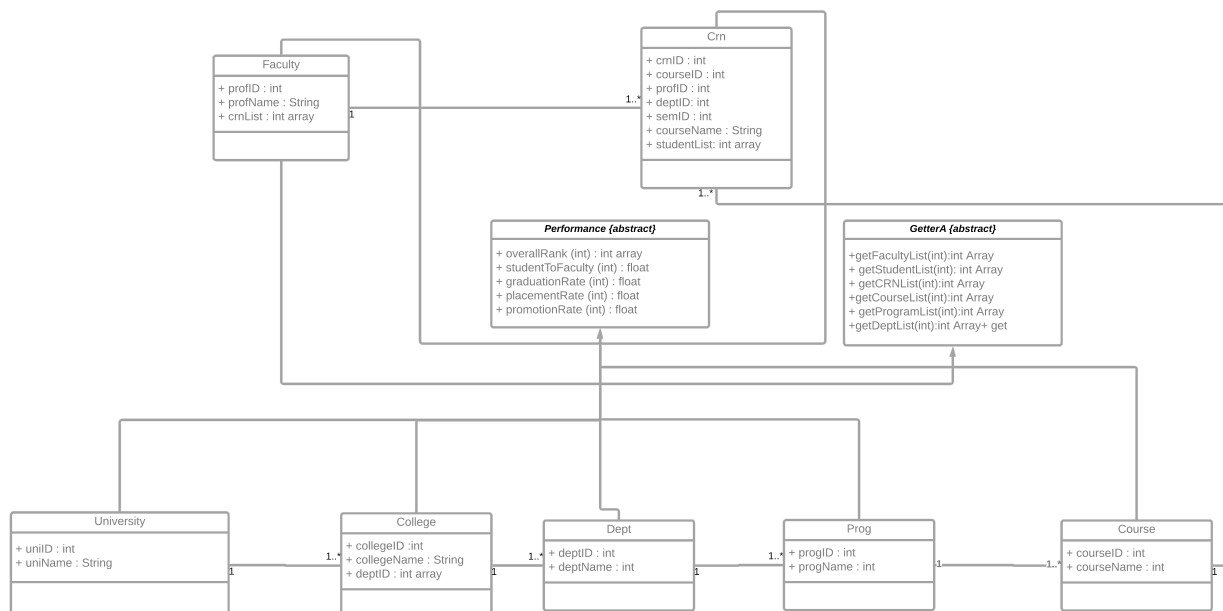
1.3. Intended Audience and Document Overview

- University administrators or stakeholders who are keen on determining the performance of the colleges/departments/programs/courses offered by universities

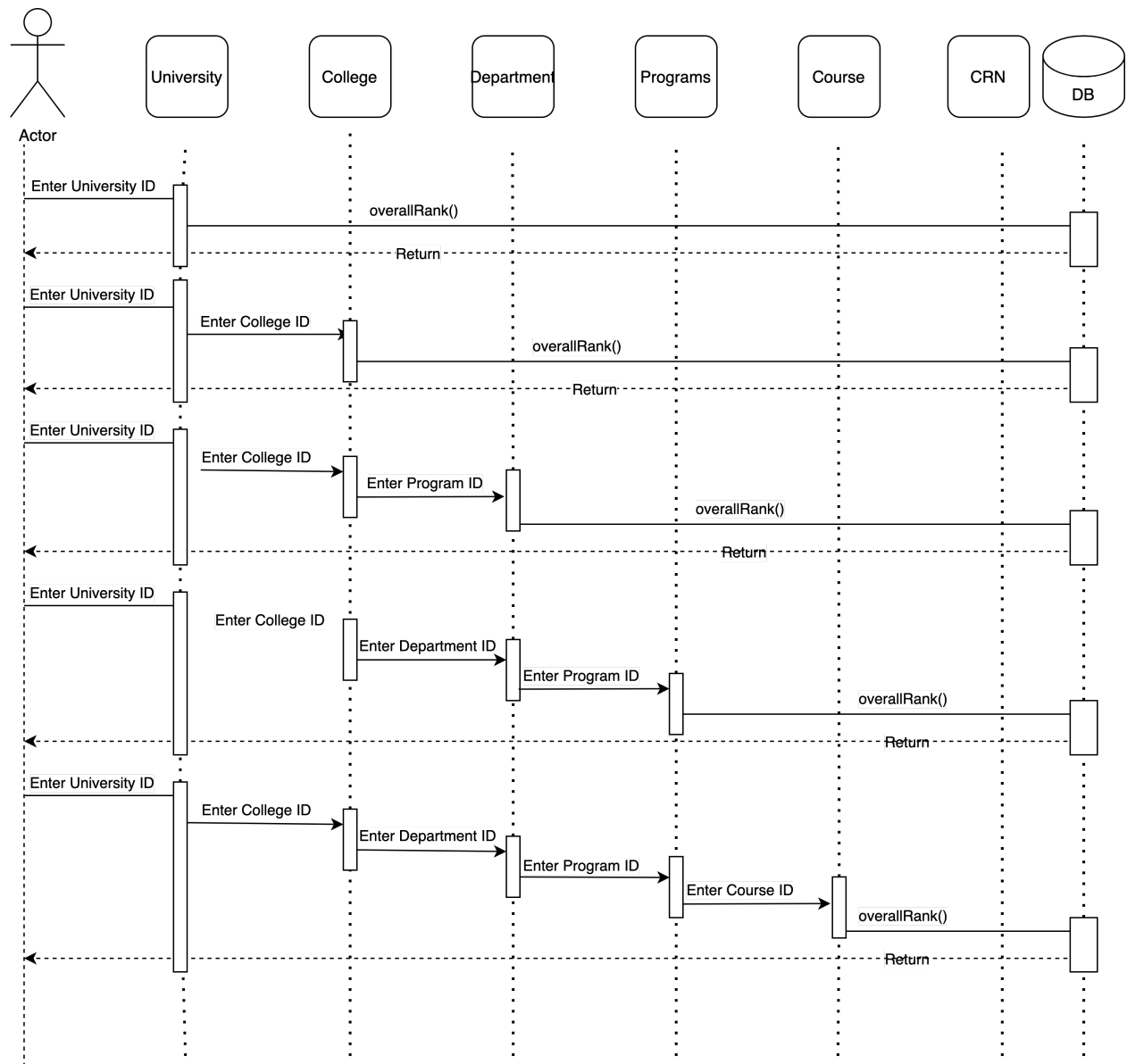
- Online Users, such as students, who are interested in comparing performance of various universities to make a choice for their education.
- Developers who are keen on developing this application further or fixing existing bug

2. Methodology

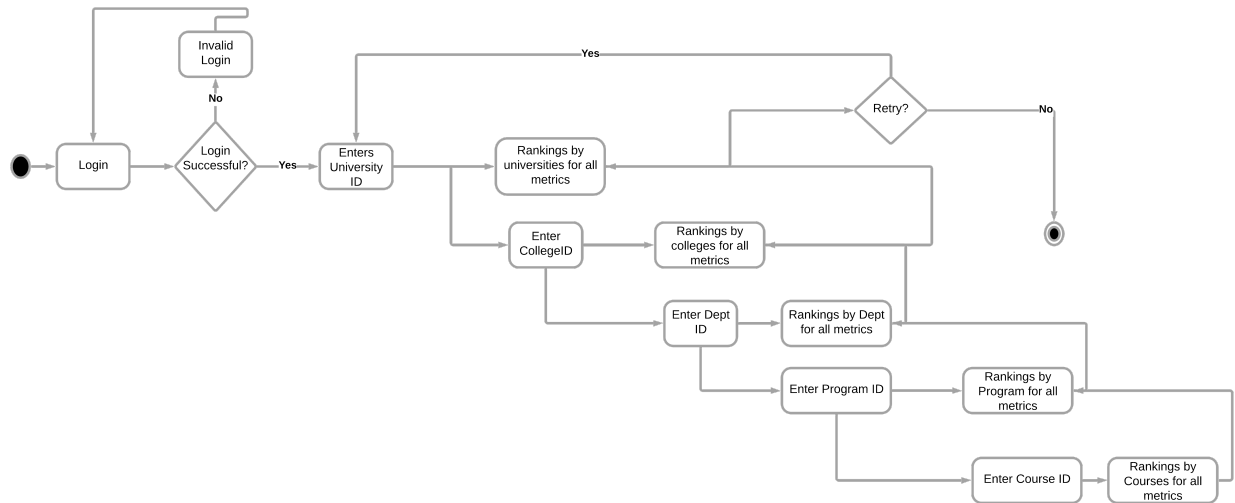
2.1. Class Diagram



2.2. Sequence Diagram



2.3. Activity Diagram



2.4. Performance Metrics

The following are the metrics used in calculating the overall rankings.

- Graduation Rate
- Placement Rate
- Promotion Rate
- Class size
- **Faculty to student ratio**

Calculating the overall rankings

- All metrics are calculated on a 100-point scale
- The metric contributes equally to rank each entity in the rankings and is calculated by the following logic

$$\text{Overall ranking} = \frac{\sum \text{metrics}}{\text{no. of metrics}}$$

1. Graduation Rate

$$\text{Graduation rate} = \frac{\text{No. of students graduating}}{\text{Total number of Students}}$$

2. Placement Rate

$$\text{Placement rate} = \frac{\text{No. of Students getting placement}}{\text{Total number of students}}$$

3. Promotion Rate

$$\text{Promotion rate} = \frac{\text{No. of Students getting promoted}}{\text{Total number of students}}$$

4. Class size ratio

- Assuming that the ideal class size 50 for a university class (100 points), for each additional student, will lead to a deduction of 0.5 points from the overall score.
- For example,
 - 51 students → 99.5 points
 - 52 students → 99 points
 - ...

5. Faculty to student ratio

$$\text{Faculty to student ratio} = \frac{\text{No. of faculty}}{\text{No. of students}}$$

2.5. Functional Requirements

- The user should be able to login to the system.
- The user should be able to enter the university ID

- The user should be able to view the overall ranking for all universities
- The user should be able to view ranking for each college/department/program/course/faculty for the selected university
- This ranking system has to be able to integrate to any universal system model

2.6. Non Functional Requirements

- Performance Requirements:
 - The application should load and be usable within 4 seconds.
- Safety and Security Requirements:
 - Timely updates and backups are being done to secure student information and avoid loss of data in the database.
- Software Quality Attributes:
 - The application is designed well making it easy to use.
- Correctness:
 - The application must show the information requested by users accurately.
- Enhancements:
 - The application should use continuous integration and designed in such a way that new features can be deployed quickly without downtime.
- Maintainability:
 - The application should undergo regular bug fixes.
- Usability:
 - The interface should be easy to learn and use without any tutorial and should allow users to accomplish their goals without errors

3. Results


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University Ranking System

EMAIL

PASSWORD

Login



College_A Rankings

Rank	Faculty	Dept	Program	Courses
1	fac_A	dept_A	prog_A	course_A
2	fac_B	dept_B	prog_B	course_B
3	fac_C	dept_C	prog_C	course_C
4	fac_D	dept_D	prog_D	course_D
5	fac_E	dept_E	prog_E	course_E


☐ Overall Rankings
☐ Promotion Rate
☐ Graduation Rate
☐ Placement Rate
☐ Faculty To Student Ratio
☐ Students per Class Ratio

Calculate Rankings for each Dept

Enter Dept ID

Submit

Exit



Dept_A Rankings

Rank	Faculty	Program	Courses
1	fac_A	prog_A	course_A
2	fac_B	prog_B	course_B
3	fac_C	prog_C	course_C
4	fac_D	prog_D	course_D
5	fac_E	prog_E	course_E

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