Application Engineering Development

University Model Report

(In support of assignment 3 for INFO5100)

Assignment Group Member:

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Introduction

The objective of this assignment is instill the techniques for turning an object model into a machine for information gathering and data aggregation. We want to use software engineering techniques to improve the quality of education anywhere and hold people accountable for improving the quality of life through education, learning to learn, and feedback.. The approach will be to look into how an

educational system in terms of faculty and courses contribute to the growth of their graduates over a 5-year period. Tracking the jobs and promotions graduates get over time and assign rankings accordingly will be included. In addition, track the connection of courses and their relevance to graduates' growth.

Additional question is to consider ways to define your own ranking system for students to decide where they want to go for their studies will be included. The current system is biased toward research.

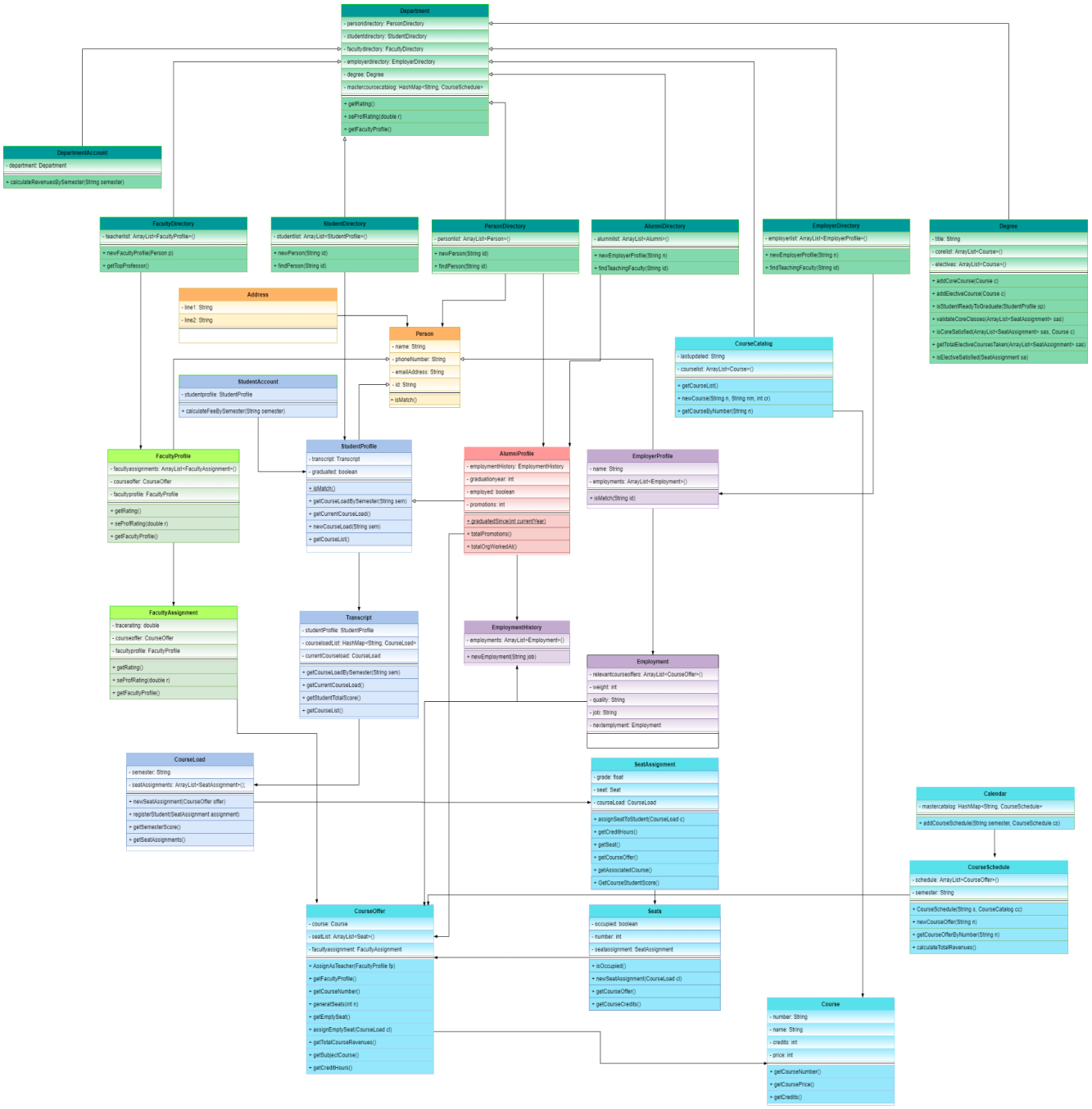
Goal of the Assignment

To study ways to create a performance measurement solution to enable universities to measure the quality of the education they deliver to their students.

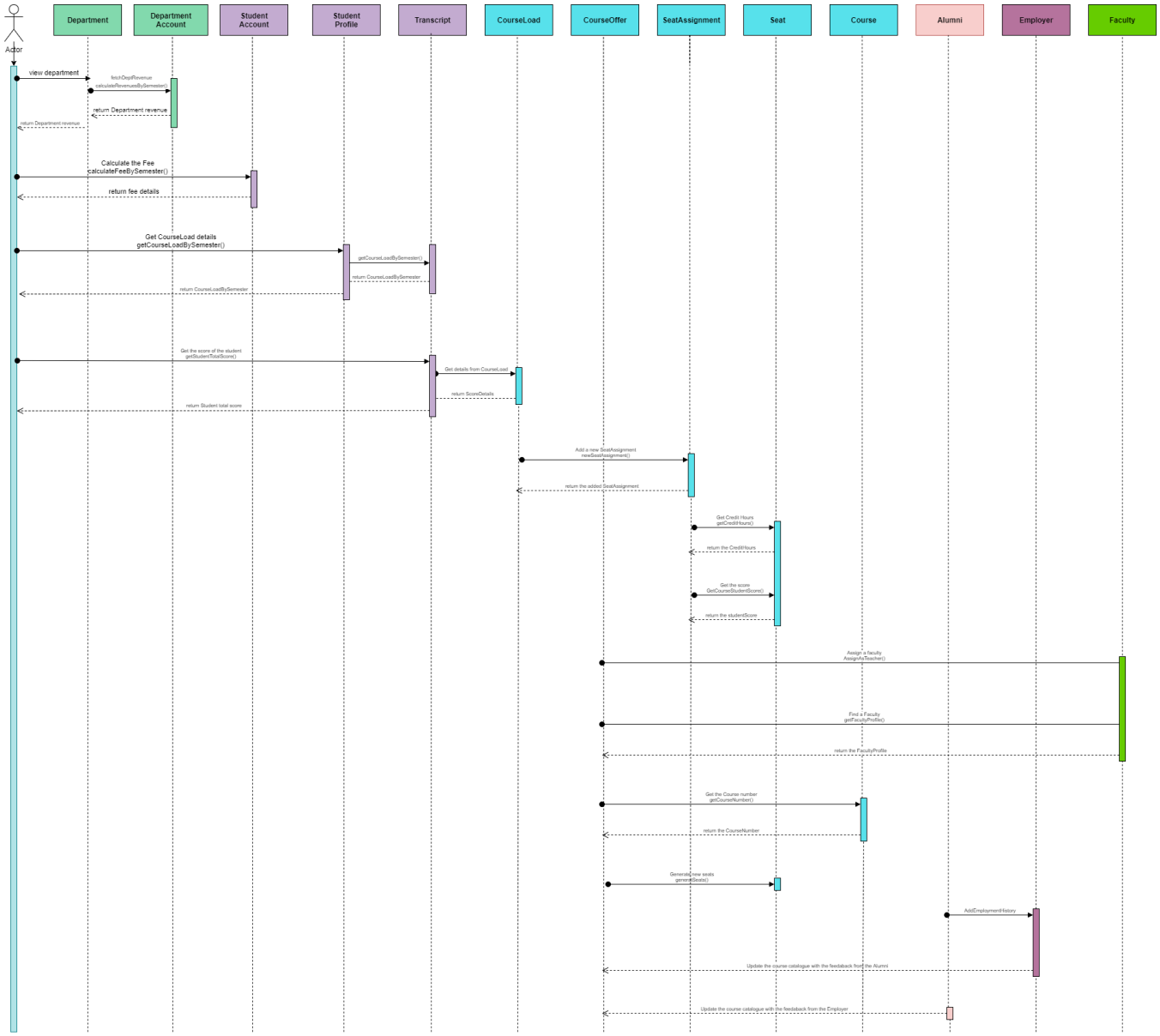
Task of the Assignment

- To model a Sequence diagram showing how to navigate the university object model to deliver performance metrics needed for performance and feedback.
- To model a class diagram showing the changes to the university model to support the new capabilities.
- To design a dashboard that enables college and university administrators to compare the performance of their academic units

UML MODEL (UML CLASS DIAGRAM)



UML SEQUENCE DIAGRAM (UML SEQUENCE DIAGRAM)



Use Case - Course

Documentation:

The Department of each college lists all the courses that are offered irrespective of semester .
The Course Consists of a name , it's number (Course Number) , the credits given upon completion of the course and it's price

Use Case - Course Catalog

Documentation:

The Department of each college lists all the courses that are offered irrespective of semester .
The Course Catalog is the list of courses offered by the department
The Course Catalog is associated with course (it cannot exist without the course class).

List of Associations

The Course Catalog uses the Course class to add it to the list of Course Catalog.

Use Case - Course Load

Documentation:

The Course Load is the list of Courses that the student has taken in a given semester
It consists of the semester number that the student has taken in the particular semester
It also consists of the Seat Assignment list

List of Associations

The Course Load is connected to the Seat Assignment where the seat is associated with the course offer and there is a one-one relationship between student and seat.

Use Case - Course Offer

Documentation:

The Course Offer consists of the course and the list of seats.
It also is connected to the faculty teaching the course.
It consists of methods to get the faculty teaching the course,the course number, assignment of a particular seat to the student, credits and the total revenue generated by the course

List of Associations

The Course Offer is connected to the Course, a list of seats that are available for that course and it's also linked to the Faculty Assignment which determines which faculty will be teaching the course.

Use Case - Course Schedule

Documentation:

The Course Schedule consists of all the courses offered,list of the schedules of that particular course in that particular semester.

It consists of methods to course number in the Course Offering list and the revenue generated by the course in that semester

List of Associations

The Course Schedule is connected to the Courseoffer.

Use Case - Seat

Documentation:

The seat is the selling quantity that the student has to purchase to get himself/herself enrolled in the course in that particular semester.It has a unique number that is associated with the seat and assigned to the student upon registration

It consists of methods to check if the set has already been assigned to a particular student, linking seat assignment to seat in the particular course load of the student ,and the course offer

List of Associations

The Seat is connected to the SeatAssignment.

Use Case - Seat Assignment

Documentation:

The seat Assignment is the seat allotted to the student in the particular course load .The methods associated with the Seat include the grade, assignment of seat to student through course load, the course offer, it's credits and the associated course

List of Associations

The Seat Assignment is connected to the CourseLoad.

Use Case - Degree

Documentation:

The proof and the complete course completion is in the degree. It has the list of the core(mandatory) courses and electives courses done for the completion of the course.
It consists of methods to get the list of core, elective courses and validate against the requirements to get the degree.

List of Associations

The Degree extends from the Department class and consists of a list of the Course class. It has two attributes; ‘corelist’ and ‘electives’.

Use Case - Department

Documentation:

The department is the sub-unit of the college. Each department has a particular name and list of student, faculty, all the degrees of the students, alumni and the courses offered by the department.
The methods consists of add courses, the added courses to core courses and elective courses, get the list of student and courses, a method for registering a particular student to a course and the overall revenue generated by the department.

List of Associations

The Department is a super class and is extended by ‘DepartmentAccount’, ‘FacultyDirectory’, ‘StudentDirectory’, ‘PersonDirectory’, ‘AlumniDirectory’, ‘EmployerDirectory’ and ‘Degree’.

Use Case - Department Account

Documentation:

The department is the sub-unit of the college. Each department has a particular name and list of student, faculty, all the degrees of the students, alumni and the courses offered by the department.
The department account consists methods such as the calculation of the revenue by the department per semester.

List of Associations

The Department Account is connected to the Department class.

Use Case - Calendar

Documentation:

The Calender is the tool(hashmap) for the creation of the course schedule.
It's method consists of mapping the course schedule with the semester

List of Associations

The Calendar is connected to the CourseSchedule class.

Use Case - Employer Directory

Documentation:

The Employer Directory is a list of the Companies that the students get hired to from each department

List of Associations

The Employer Directory is connected to the EmployerProfile.

Use Case - Employer Profile

Documentation:

The Employer Profile is a details such as the name of the company or the person hired

List of Associations

The Employer Profile is connected to the Employment class.

Use Case - Person

Documentation:

The Person is the main actor from which all the classes are derived from.
It is associated with a unique ID

List of Associations

The Person is extended by 'FacultyProfile', 'StudentProfile', 'AlumniProfile' and 'EmployerProfile'

Use Case - Person Directory

Documentation:

The Person Directory is the list of person with the unique ID

List of Associations

The Person Directory is connected to the Person class.

Use Case - Student Directory

Documentation:

The Student Directory is the list of student from a particular department
It contain the method to find a particular student from a particular department,it adds the student to the directory

List of Associations

The StudentDirectory is connected to the StudentProfile class.

Use Case - Student Profile

Documentation:

The Student profile contains the details of the student such as his transcript and employment history.
It contains the methods to get/add the course load by semester, get the course list and fetching the transcript of the student

List of Associations

The Student profile is connected to the transcripts, student account and extended by the Alumni Profile

Use Case - Transcript

Documentation:

The transcript is mapped to the concerned unique student profile and course list.
It contains methods to the current course load by the student, total score and to get the course load based on the semester

List of Associations

The Transcript is connected to the Transcript class.

Use Case - Employment

Documentation:

The Employment contains attributes of the student such as the course load taken,it's weightage, quality of the job and the leakage between the current job and his/her next job.

List of Associations

The Employment is connected to the CourseOffer class and EmploymentHistory class.

Use Case - Employment History

Documentation:

The Employment History contains the list of companies that the student has been associated with

List of Associations

The Employment History is connected to the Employment Class.

Use Case - Faculty Assignment

Documentation:

The Faculty Assignment is the association of the faculty with the concerned course load. It contains attributes like the rating of the faculty

List of Associations

The Faculty Assignment is connected to the CourseOffer class.

Use Case - Faculty Profile

Documentation:

The Faculty Profile contains the details of the faculty. It contains attributes like the name and the list of the assigned courses .
It contains the methods to retrieve the average rating of the faculty, assignment of the faculty with the course offer

List of Associations

The Faculty Profile is connected to the FacultyAssignment class.

Use Case - Faculty Directory

Documentation:

The Faculty Directory contains the list of the faculty in the particular department.It contains method to fetch the top faculty(based on the rating), adding faculty and checking if the faculty is associated with the department

List of Associations

The Faculty Directory class inherits from the Department class and is connected to the FacultyProfile class.

Use Case - AlumniDirectory

Documentation:

The AlumniDirectory contains the list of the alumni in the particular department.It enlists all the alumni that passed out from that department.

List of Associations

The AlumniDirectory is connected to the AlumniProfile class.

Use Case - AlumniProfile

Documentation:

The Alumni Profile class consists of the details of the Alumni. It inherits from the StudentProfile class. It consists of a few methods that return the time since they have graduated, total number of promotions that they have earned after they started workin and if they are employed.

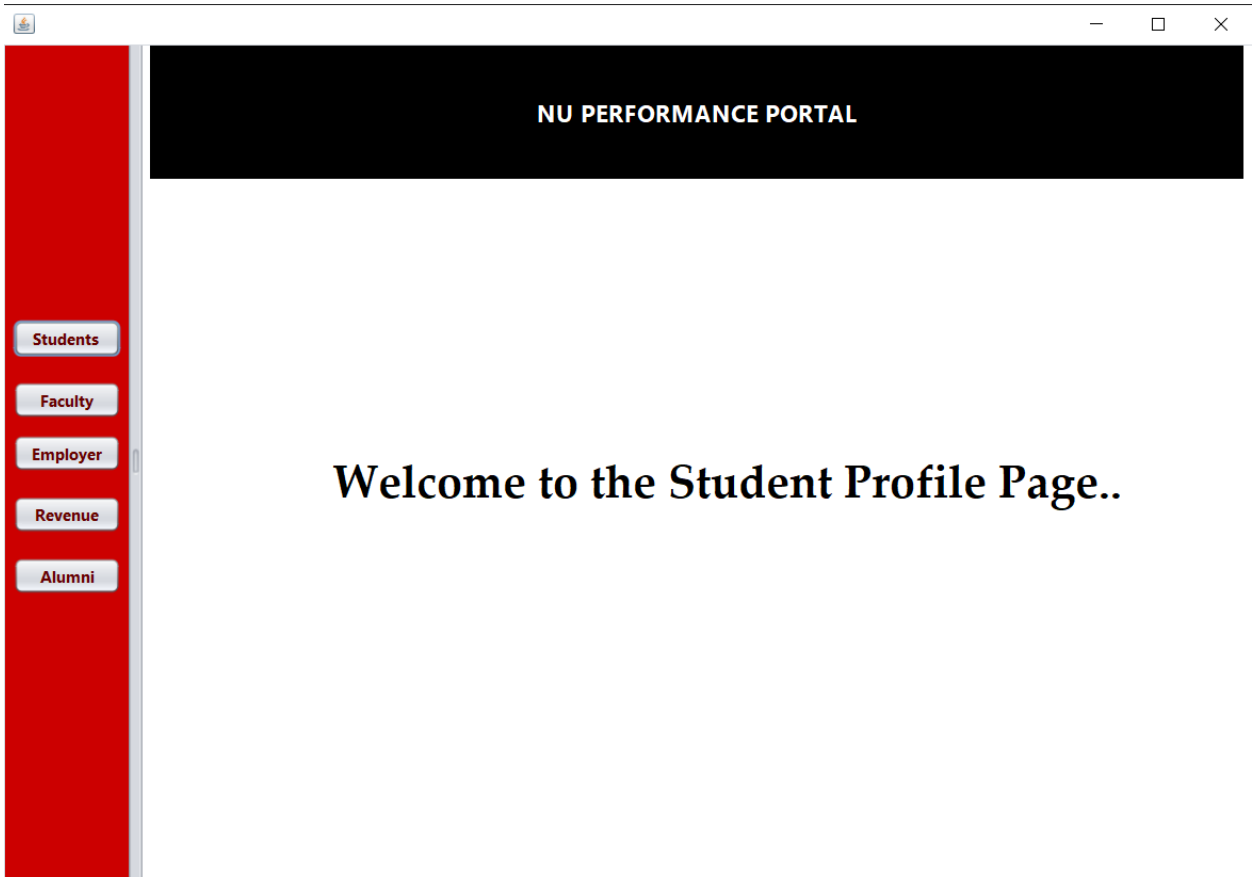
List of Associations

The AlumniProfile is connected to the EmploymentHistory class.

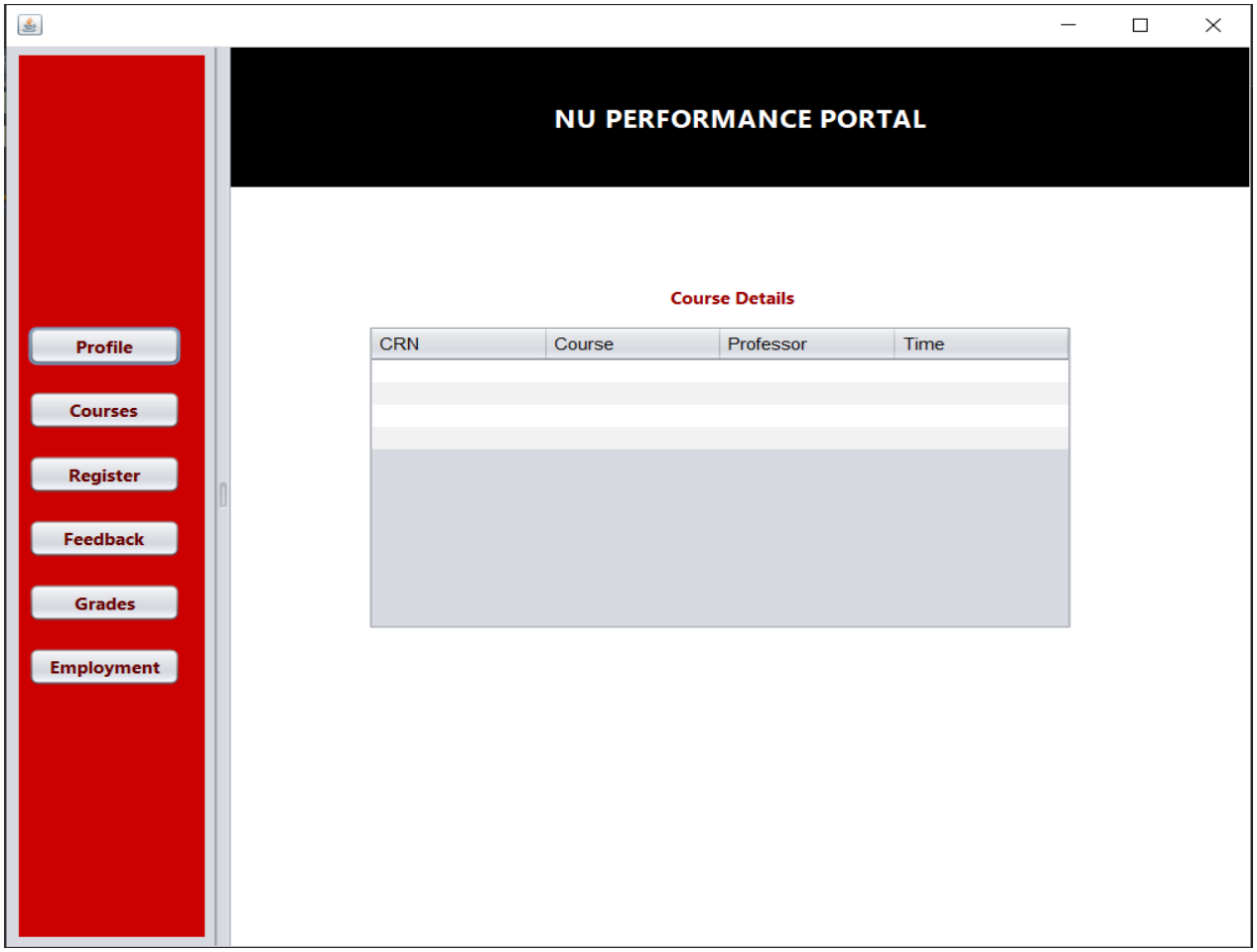
User Interface(DASHBOARD):

The user interface was created using Java Swing. This UI is a visualization of how the dashboard for the given problem statement will appear.

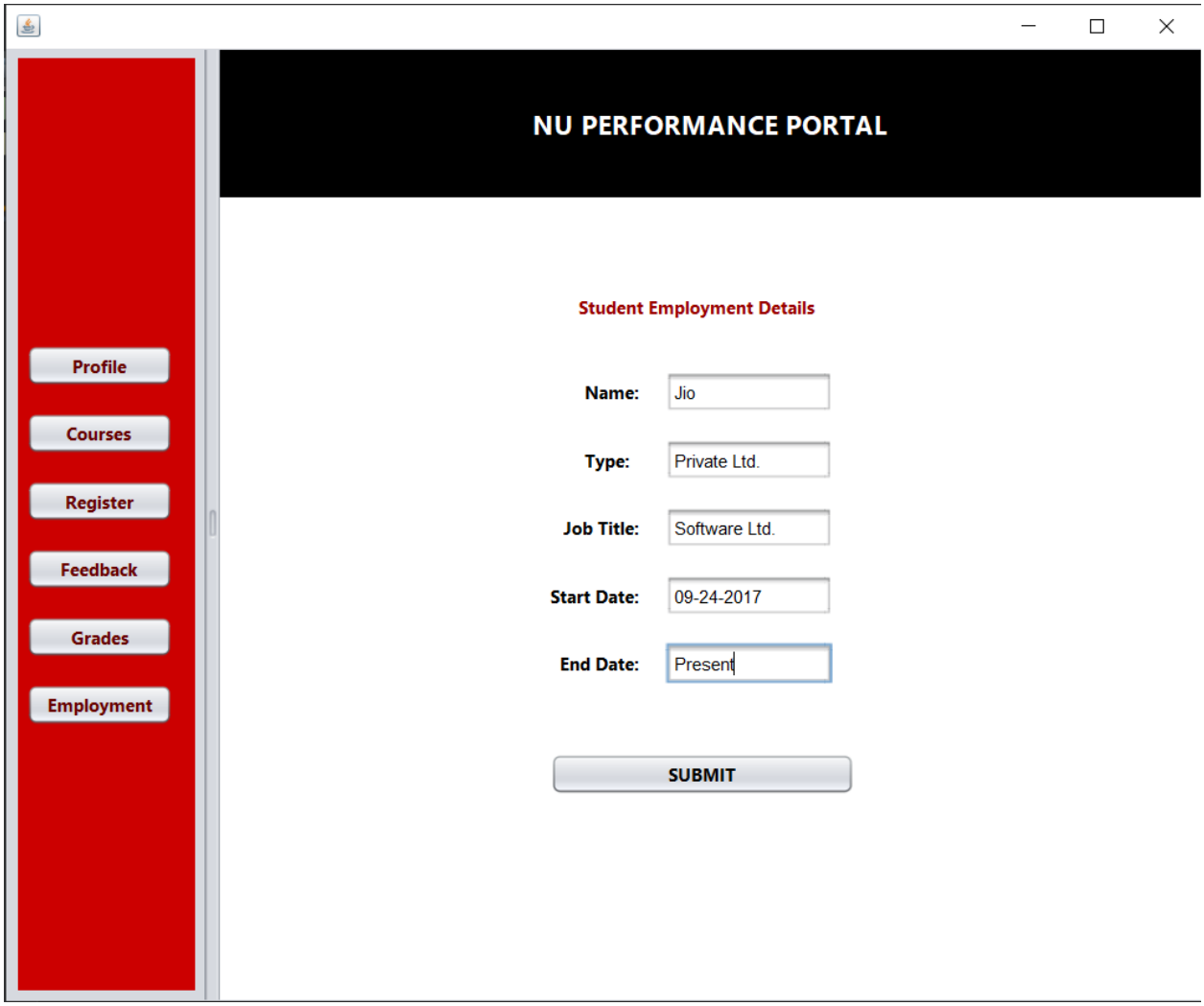
- **Student Profile:**



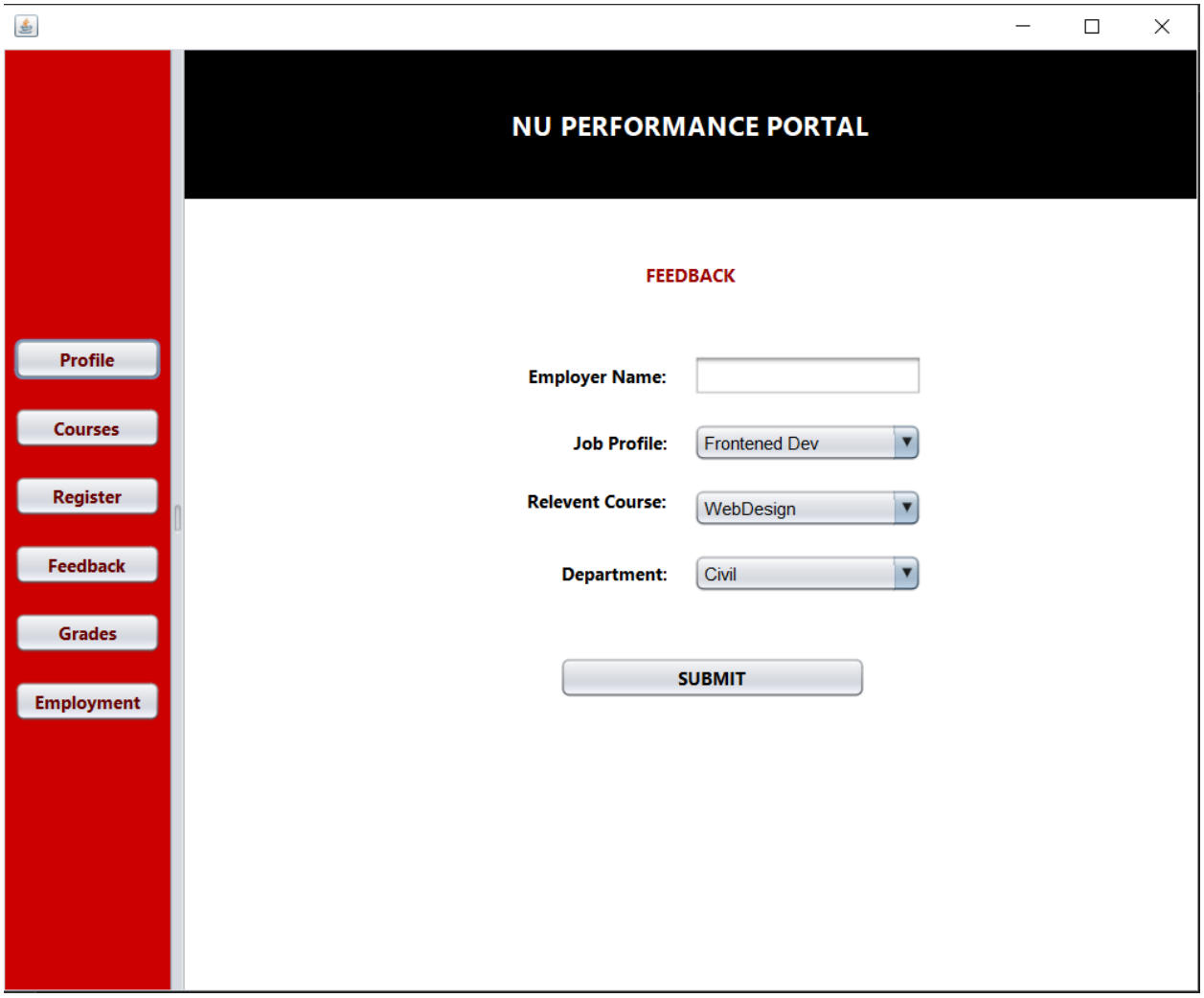
- **Student Courses:**



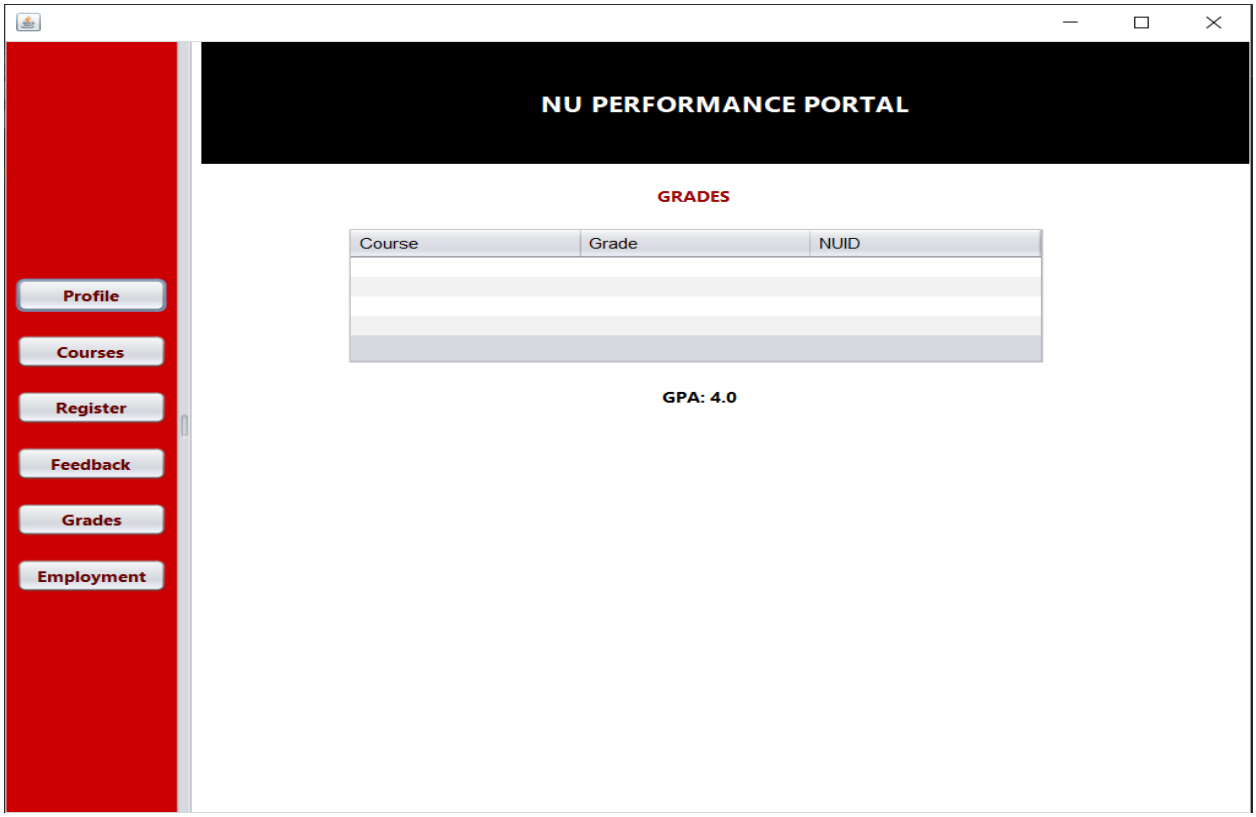
- **Student Employment:**



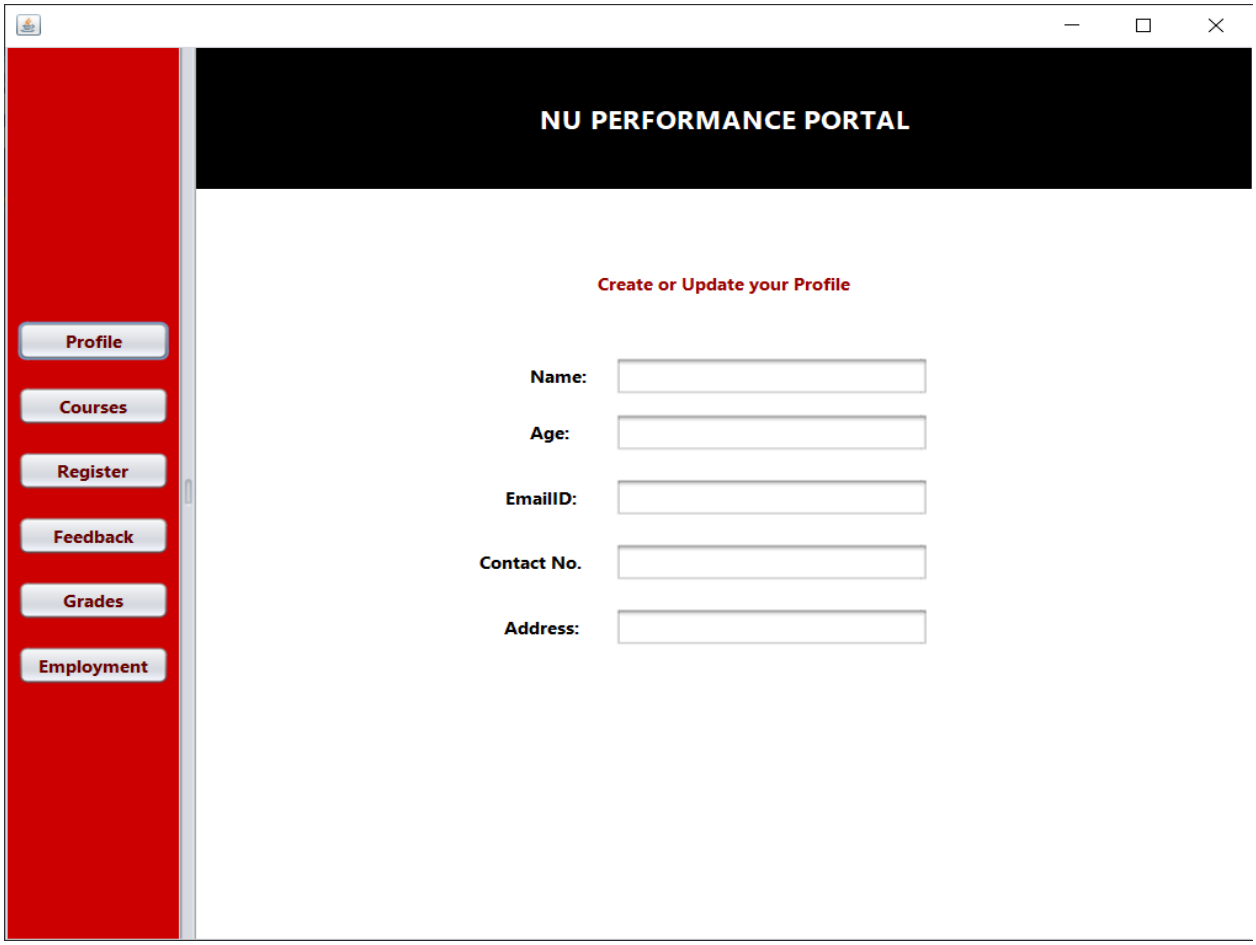
- **Student Feedback:**



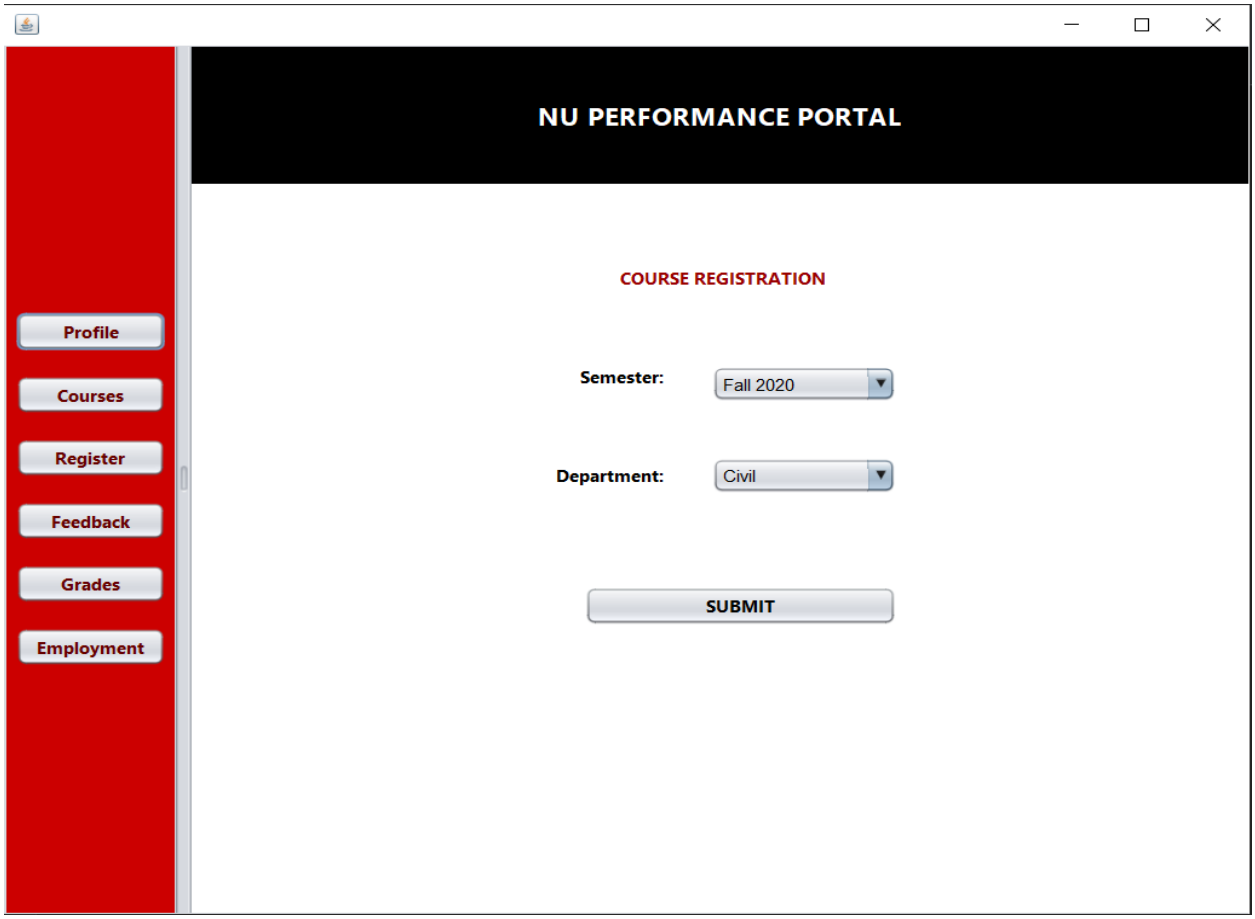
- **Student Grades:**



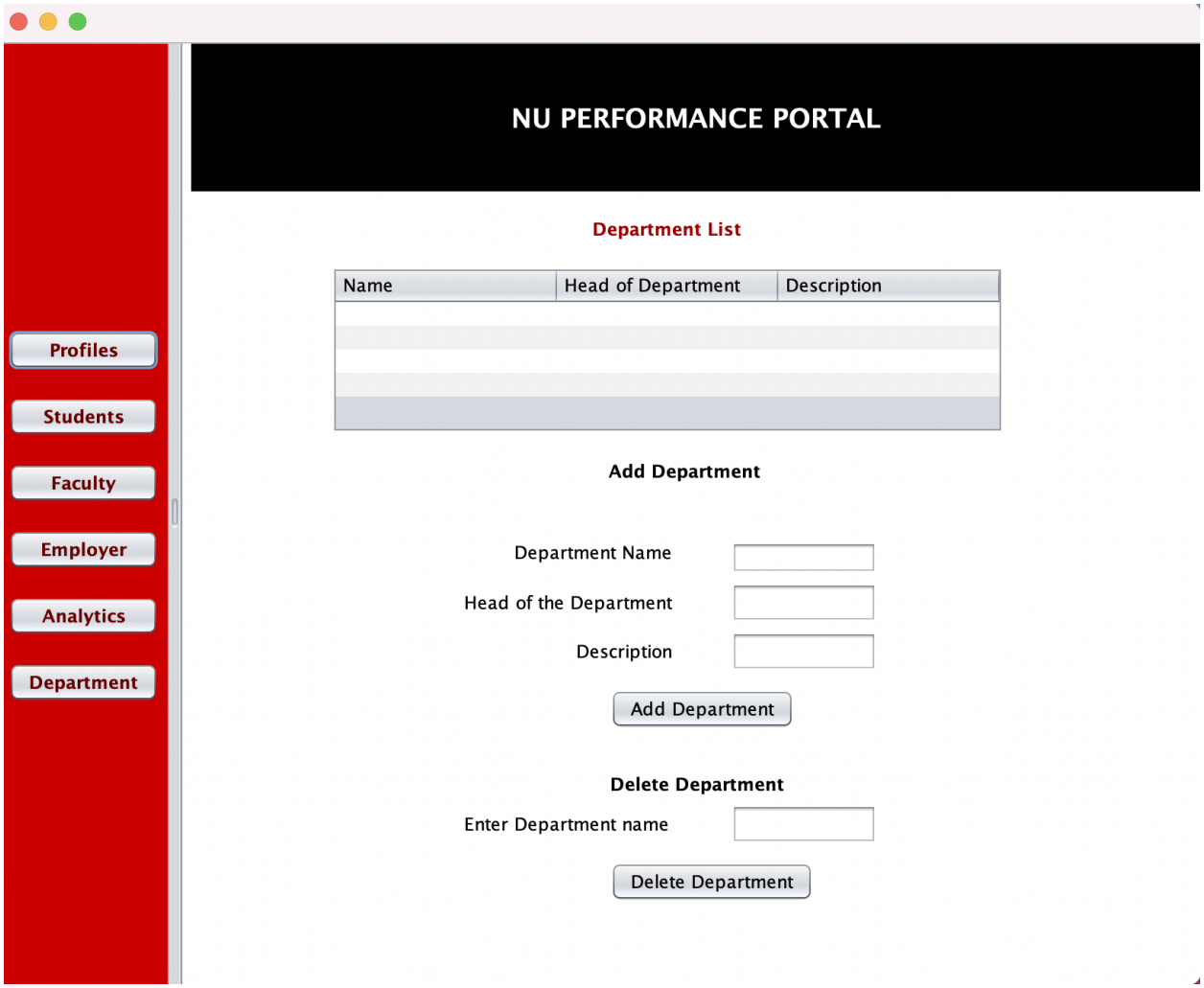
- **Student Profile:**



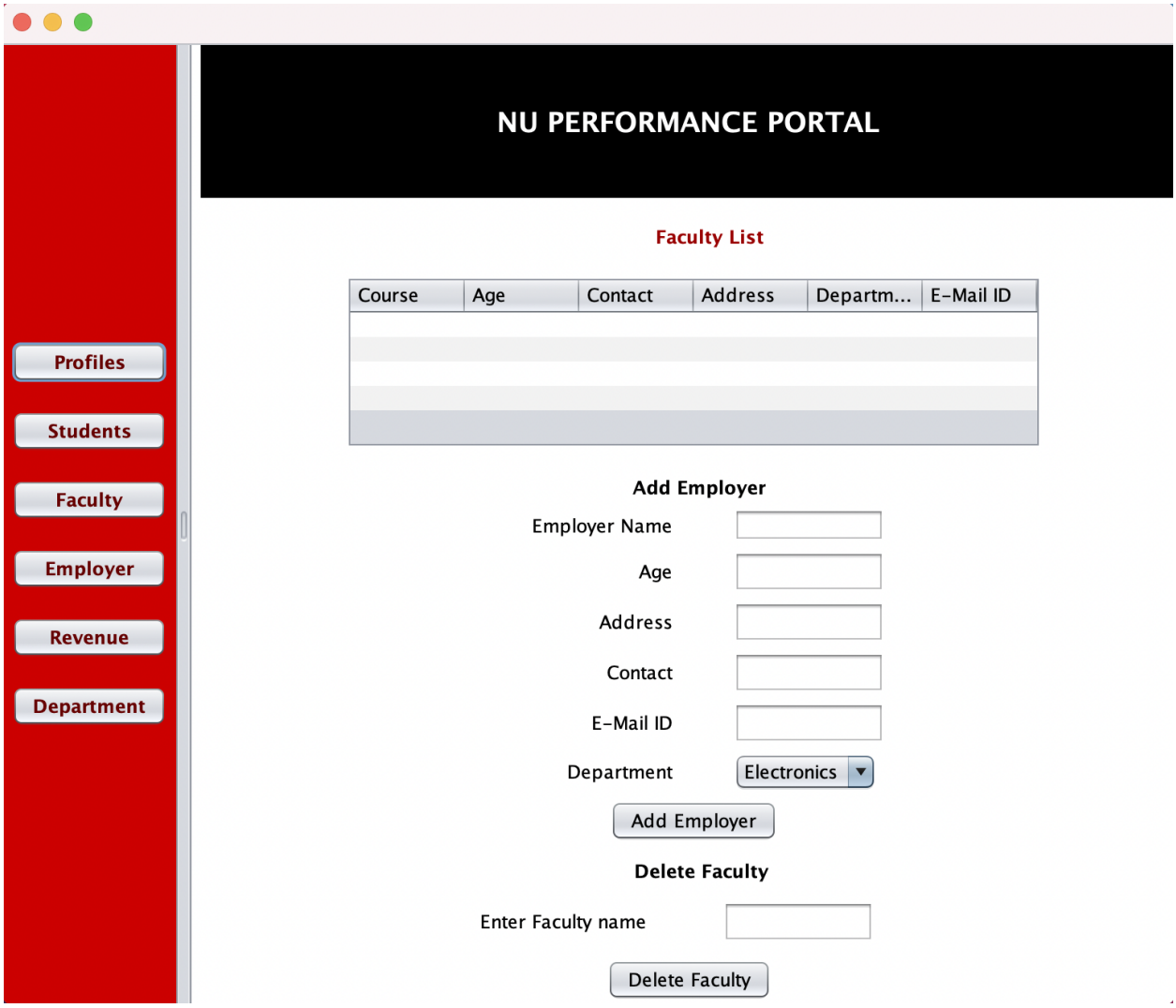
- **Student Registration:**



- **Department:**


NU PERFORMANCE PORTAL
Profiles
Students
Faculty
Employer
Analytics
Department
Department List
Name
Head of Department
Description
Add Department
Department Name
Head of the Department
Description
Add Department
Delete Department
Enter Department name
Delete Department

- **Faculty:**


NU PERFORMANCE PORTAL
Profiles
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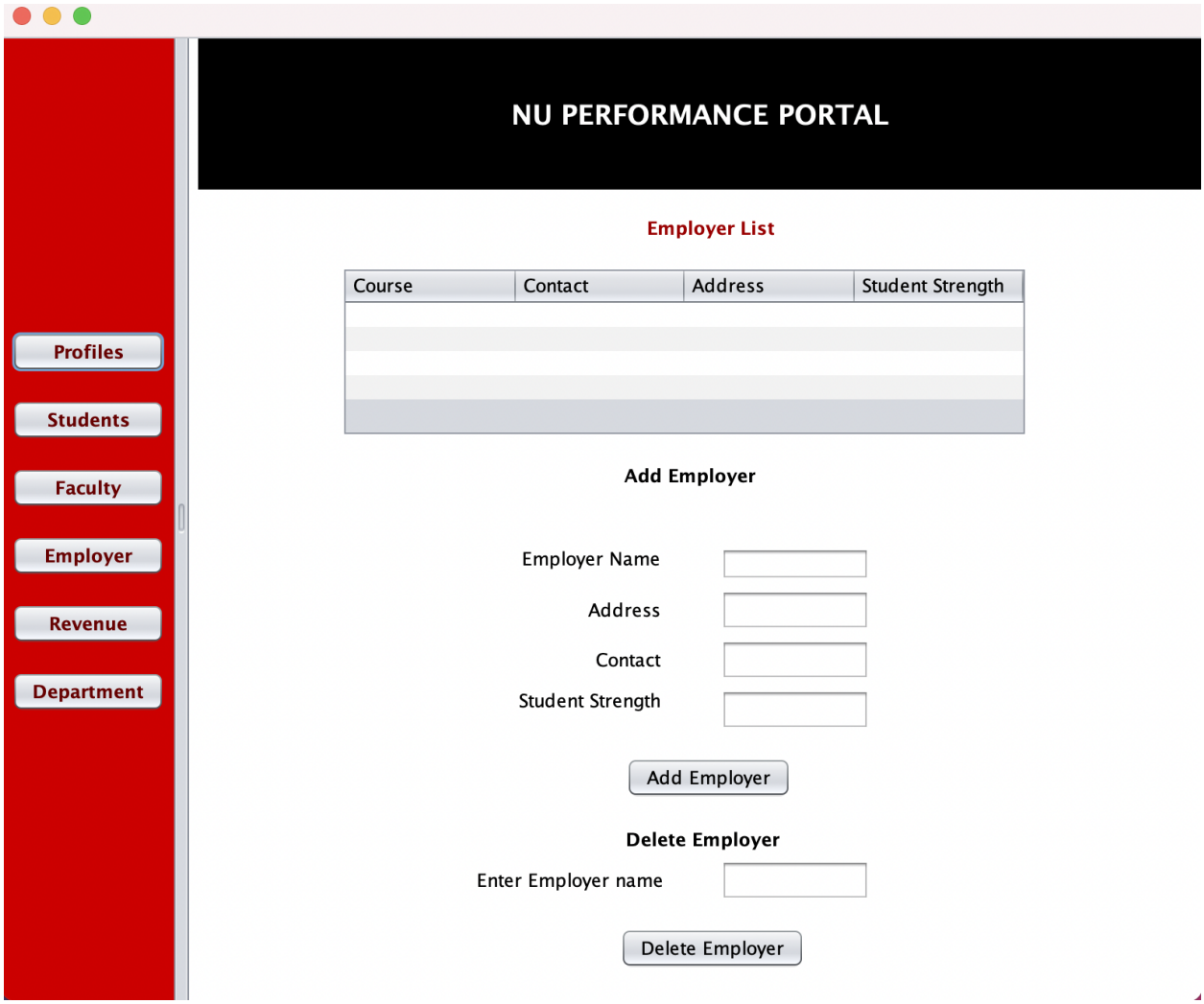
- **Employer:**


NU PERFORMANCE PORTAL
Profiles
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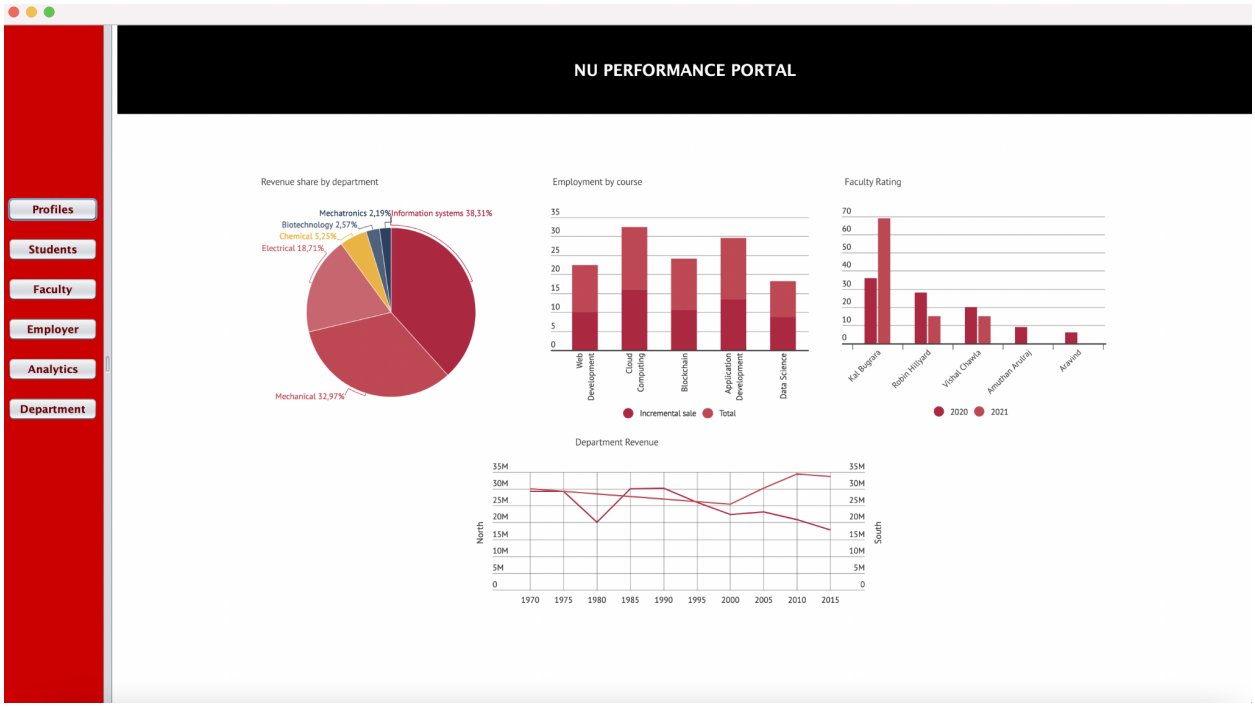
- **Analytics:**


NU PERFORMANCE PORTAL
Profiles
Students
Faculty
Employer
Analytics
Department
Revenue share by department
Mechatronics 2,19%
Information systems 38,31%
Biotechnology 2,57%
Chemical 5,25%
Electrical 18,71%
Mechanical 32,97%
Employment by course
Web Development
Cloud Computing
Blockchain
Application Development
Data Science
Incremental sale
Total
Faculty Rating
Kal Bugara
Robin Hiliyard
Vishal Chawla
Arnuthan Arulraj
Aravind
2020
2021
Department Revenue
North
South
1970
1975
1980
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