



The Superior University

Student Course Registration System

Simulation of First Come First Serve (FCFS) Scheduling in Python

Group Members

Team members with roll numbers:

- Zain Ul Hassan (Roll No. 085)
 - Mahnoor Mateen (Roll No. 092)
 - Ayesha Shoukat (Roll No. 104)
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GitHub Repository

GitHub Repository Link:

<https://github.com/Mahnoor-Mateen/student-course-registration-system.git>

Scheduling Algorithm Implemented

✓ Tick the scheduling algorithm your group implemented:

- ☒ FCFS (First Come First Serve)
 - ☐ SJF (Shortest Job First – Non-Preemptive)
 - ☐ SJF (Preemptive)
 - ☐ Round Robin
-

Project Description

Problem Statement:

This project addresses the challenge of managing student course registrations at a university. It ensures fair and organized enrollment using a First-Come-First-Serve (FCFS) mechanism, while also handling over-enrollment via a waitlist system. It helps administrators easily add students and courses, register students efficiently, and view course or student information.

Inputs:

- **Student Information:** student_id, name, and email
- **Course Information:** course_code, name, teacher, and maximum seats
- **For Registration:** Selected student_id and course_code

Outputs:

Confirmation of successful course registration or placement on the waitlist.

Details of:

- Course information including enrolled students and waitlist.
- Individual student's registered courses.
- All available courses and students.

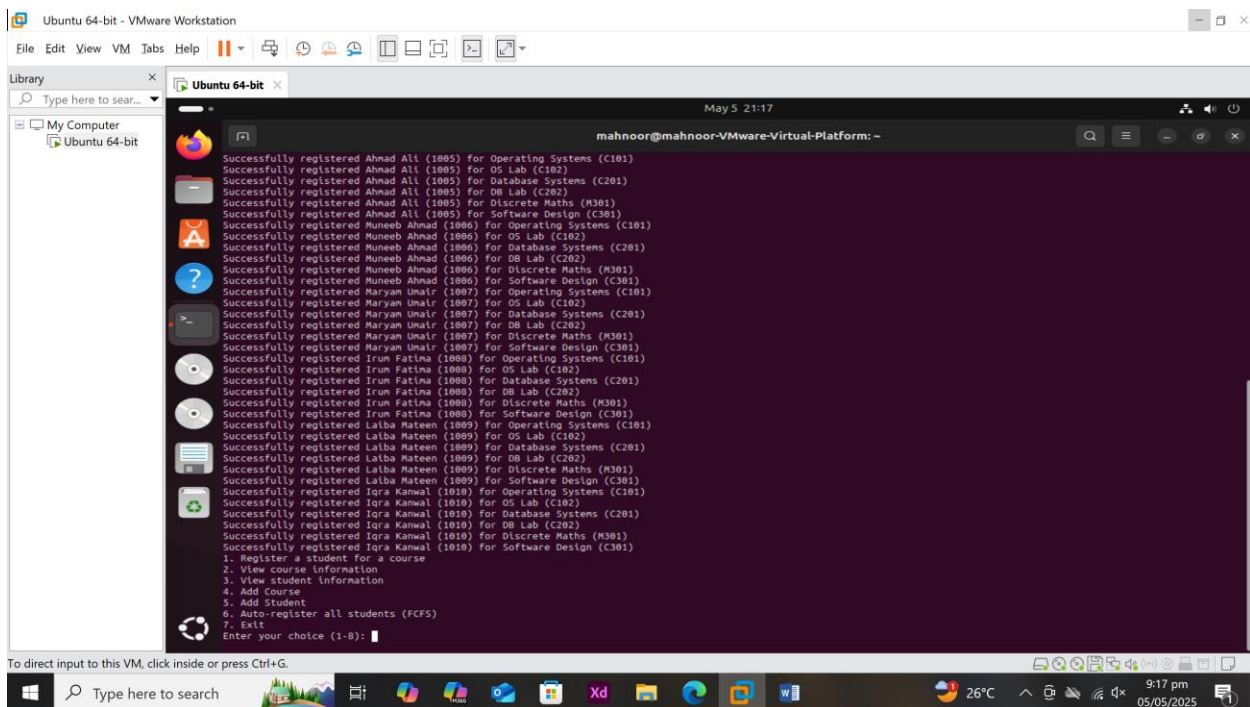
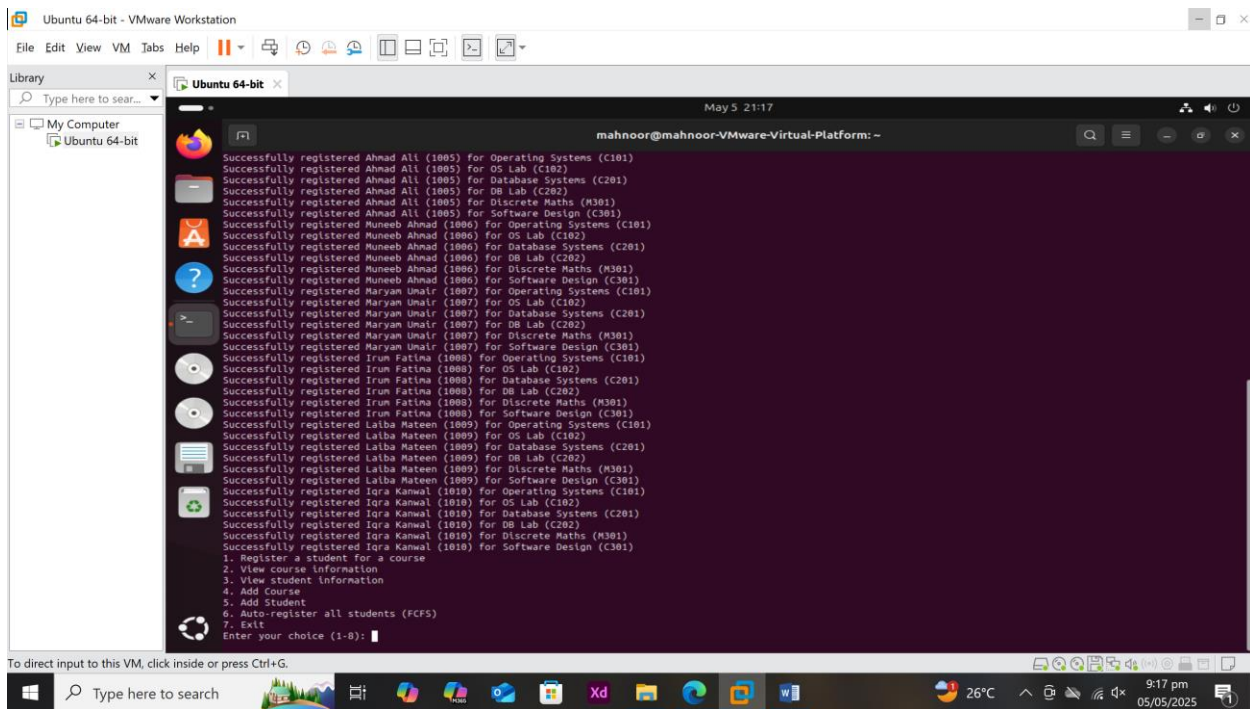
Notifications if:

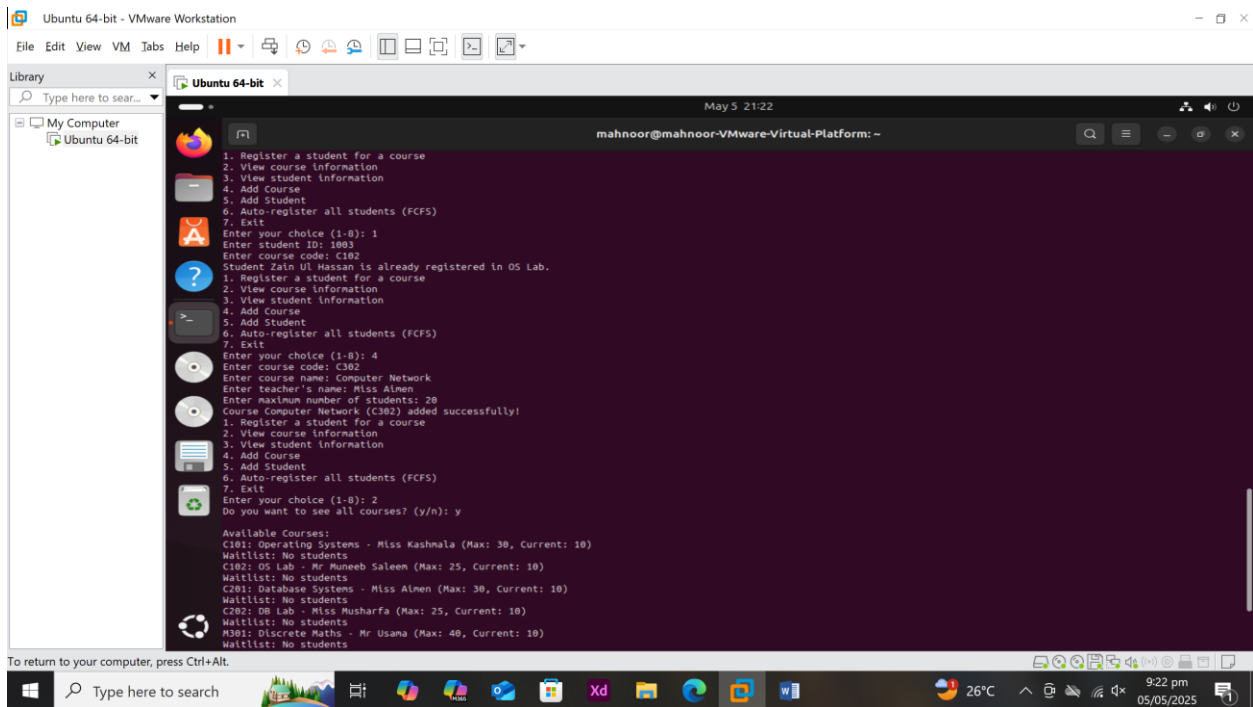
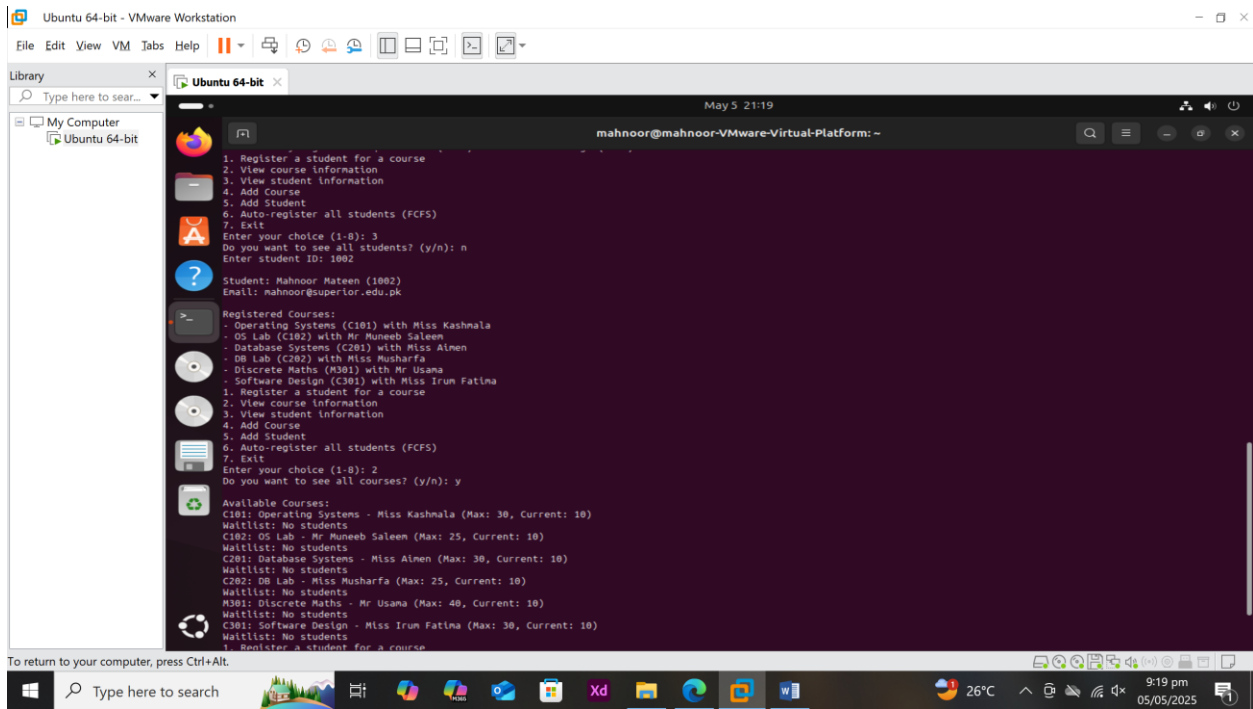
- A student or course already exists.
 - Registration is denied due to capacity or duplication.
-

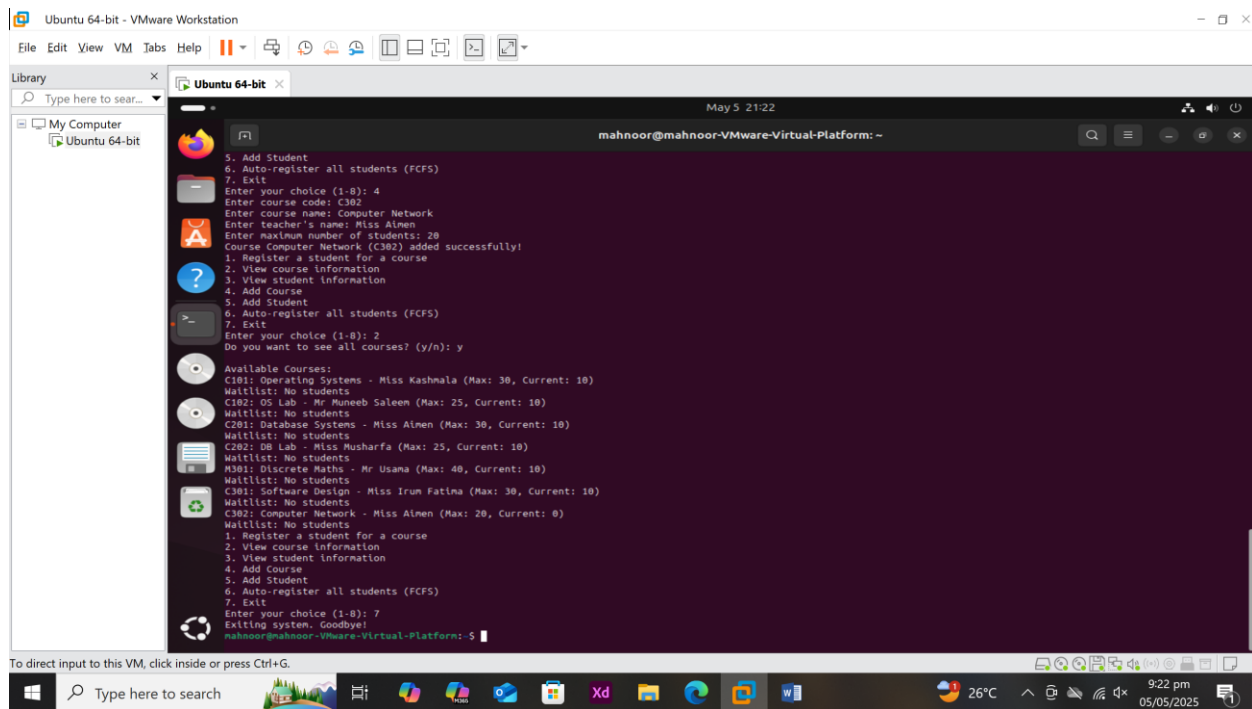
Output Screenshots

```
mahnoor@mahnoor-VMware-Virtual-Platform: ~  
mahnoor@mahnoor-VMware-Virtual-Platform: $ python3 studentregistrationsystem.py  
=== Welcome to Superior University Course Registration ===  
  
--- Course Registration System ---  
1. Register a student for a course  
2. View course information  
3. View student information  
4. Add Course  
5. Add Student  
6. Auto-register all students (FCFS)  
7. Exit  
Enter your choice (1-8): 6  
Successfully registered Ayesha Shoukat (1001) for Operating Systems (C101)  
Successfully registered Ayesha Shoukat (1001) for OS Lab (C102)  
Successfully registered Ayesha Shoukat (1001) for Database Systems (C201)  
Successfully registered Ayesha Shoukat (1001) for DB Lab (C202)  
Successfully registered Ayesha Shoukat (1001) for Discrete Maths (M301)  
Successfully registered Ayesha Shoukat (1001) for Software Design (C301)  
Successfully registered Mahnoor Mateen (1002) for Operating Systems (C101)  
Successfully registered Mahnoor Mateen (1002) for OS Lab (C102)  
Successfully registered Mahnoor Mateen (1002) for Database Systems (C201)  
Successfully registered Mahnoor Mateen (1002) for DB Lab (C202)  
Successfully registered Mahnoor Mateen (1002) for Discrete Maths (M301)  
Successfully registered Mahnoor Mateen (1002) for Software Design (C301)  
Successfully registered Zain Ul Hassan (1003) for Operating Systems (C101)  
Successfully registered Zain Ul Hassan (1003) for OS Lab (C102)  
Successfully registered Zain Ul Hassan (1003) for Database Systems (C201)  
Successfully registered Zain Ul Hassan (1003) for DB Lab (C202)  
Successfully registered Zain Ul Hassan (1003) for Discrete Maths (M301)  
Successfully registered Zain Ul Hassan (1003) for Software Design (C301)  
Successfully registered Fatima Ahmed (1004) for Operating Systems (C101)  
Successfully registered Fatima Ahmed (1004) for OS Lab (C102)  
Successfully registered Fatima Ahmed (1004) for Database Systems (C201)  
Successfully registered Fatima Ahmed (1004) for DB Lab (C202)  
Successfully registered Fatima Ahmed (1004) for Discrete Maths (M301)  
Successfully registered Fatima Ahmed (1004) for Software Design (C301)  
Successfully registered Ahmad Ali (1005) for Operating Systems (C101)  
Successfully registered Ahmad Ali (1005) for OS Lab (C102)  
Successfully registered Ahmad Ali (1005) for Database Systems (C201)  
Successfully registered Ahmad Ali (1005) for DB Lab (C202)  
Successfully registered Ahmad Ali (1005) for Discrete Maths (M301)  
Successfully registered Ahmad Ali (1005) for Software Design (C301)  
Successfully registered Muneeb Ahmad (1006) for Operating Systems (C101)  
Successfully registered Muneeb Ahmad (1006) for OS Lab (C102)  
Successfully registered Muneeb Ahmad (1006) for Database Systems (C201)
```

```
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Enter your choice (1-8): 6  
Successfully registered Ahmad Ali (1005) for Operating Systems (C101)  
Successfully registered Ahmad Ali (1005) for OS Lab (C102)  
Successfully registered Ahmad Ali (1005) for Database Systems (C201)  
Successfully registered Ahmad Ali (1005) for DB Lab (C202)  
Successfully registered Ahmad Ali (1005) for Discrete Maths (M301)  
Successfully registered Ahmad Ali (1005) for Software Design (C301)  
Successfully registered Muneeb Ahmad (1006) for Operating Systems (C101)  
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Successfully registered Muneeb Ahmad (1006) for DB Lab (C202)  
Successfully registered Muneeb Ahmad (1006) for Discrete Maths (M301)  
Successfully registered Muneeb Ahmad (1006) for Software Design (C301)  
Successfully registered Maryam Unair (1007) for Operating Systems (C101)  
Successfully registered Maryam Unair (1007) for OS Lab (C102)  
Successfully registered Maryam Unair (1007) for Database Systems (C201)  
Successfully registered Maryam Unair (1007) for DB Lab (C202)  
Successfully registered Maryam Unair (1007) for Discrete Maths (M301)  
Successfully registered Maryam Unair (1007) for Software Design (C301)  
Successfully registered Irum Fatima (1008) for Operating Systems (C101)  
Successfully registered Irum Fatima (1008) for OS Lab (C102)  
Successfully registered Irum Fatima (1008) for Database Systems (C201)  
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Successfully registered Laiba Mateen (1009) for Operating Systems (C101)  
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Successfully registered Laiba Mateen (1009) for Discrete Maths (M301)  
Successfully registered Laiba Mateen (1009) for Software Design (C301)  
Successfully registered Iqra Kanwal (1010) for Operating Systems (C101)  
Successfully registered Iqra Kanwal (1010) for OS Lab (C102)  
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6. Auto-register all students (FCFS)  
7. Exit  
Enter your choice (1-8):
```







Code Structure & Explanation

Data Structures (Dictionaries):

- students: A dictionary storing student info (name, email, courses[]).
- courses: A dictionary storing course info (name, teacher, max, current, waitlist[]).

Functions:

- add_student(): Adds a new student to the students dictionary.
- add_course(): Adds a new course to the courses dictionary.
- register(): Handles registration logic for a single student in a single course.
- fcfs_registration_for_all_students(): Applies FCFS registration for all students in all available courses.
- show_course(): Displays course details, enrolled students, and the waitlist.
- show_student(): Shows details for a specific student and their enrolled courses.
- all_students(): Displays a list of all students and their registered courses.
- all_courses(): Displays a list of all courses along with current enrollments and waitlist count.
- main_menu(): Command-line interface for users to interact with the system.

Scheduling Algorithm (FCFS)

- Students are sorted by their ID to simulate first-come-first-serve order.
- Each student is given a chance to register for all available courses.
- If the course has seats available ($\text{current} < \text{max}$):
 - The student is registered.
 - The course's current counter is incremented.
 - The course code is added to the student's courses list.
- If the course is full:
 - The student is added to the course's waitlist[], if not already present.
- Duplicate checks are performed to:
 - Ensure a student isn't registered more than once.
 - Avoid adding the same student to the waitlist multiple times.