

## **Check My Grade App**

The **Check My Grade App** is an interactive student management system designed to facilitate students, professors, and administrators in handling student records, course details, and professor information efficiently. The main function integrates various functionalities for user authentication, student data management, course management, and professor details handling. I created student.csv where each student can enroll for four subjects, course.csv, login.csv, professor.csv

### **Key Functionalities Implemented:**

#### **Main(lab1complete.py) Implementation**

##### **1. User Authentication (Login System)**

- The system prompts users to log in with their credentials stored in login.csv.
- It checks for valid user credentials and assigns roles (student or professor).
- Users have an option to change their passwords.
- The logout feature ensures session management.

##### **2. Student Operations**

- Display student records based on email ID from Student.csv
- Add a new student along with their course details.
- Delete student records when necessary.
- Show professor details by course ID.
- Display Available Courses and their details .
- View marks and analyze performance using mean and median calculations.
- Check assigned grades based on performance comparison.

##### **3. Course Management**

- Load and display available courses from course.csv.
- Add new courses with details such as name, description, and credits.
- Delete courses based on the course ID.
- Modify existing course details, including name, description, and credits.

##### **4. Professor Management**

- Load and display professor details from professor.csv.
- Add new professors along with their assigned courses.
- Delete professors from the system.
- Modify professor details such as name, rank, and assigned courses.
- Display professor details based on the course they teach.
- Add a new student along with their course details.
- Delete student records when necessary.
- Update existing student records (modify grades or marks).

## 5. Testing:

In the testing phase, I developed a structured approach to validate the core functionalities of the Check My Grade App. The testing script (Testlab1complete.py) ensures that all components—students, courses, and professors—are working as expected by importing from lab1complete.py

### Key Areas of Testing

1. Student Records Validation
  - The test script reads the student.csv file to check if there are exactly 1000 student records.
  - It prints the total student count
  - Sorting tests were conducted on student records:
    - Sorting by marks (ascending)
    - Sorting by email (descending)
    - The execution time for each sorting operation was measured.
    -
2. Student Operations Testing
  - Adding a Student: The script prompts the user to enter details (email, name, courses, grades, marks) and ensures the student is added successfully.
  - Updating a Student Record: It allows modifying student details like course grades and marks.
  - Deleting a Student Record: The user is prompted to enter an email, and the record is deleted from student.csv.
  - All operations are performed interactively, ensuring real-time user validation.
  -
3. Course Operations Testing
  - Adding a New Course: The script prompts for course details (ID, name, description, credits) and adds it to course.csv.
  - Modifying an Existing Course: Users can update course details while keeping some existing values unchanged.
  - Deleting a Course: A course ID is entered, and the script removes it from the database.
  -
4. Professor Operations Testing
  - Adding a New Professor: The script prompts for professor ID, name, rank, and associated courses, then adds it to professor.csv.
  - Modifying a Professor's Details: Users can update the professor's name, rank, or assigned courses.
  - Deleting a Professor: The test ensures professors can be removed from the system based on user input.

## 6. Implementation of Class UML Diagram

I developed a Class UML Diagram for this Check My Grade APP using draw.io and its tools where I defined entity relationships, classes, IS-A, HS-A relations and their data types.

## Screenshots ....

```
C:\Users\Hari\Downloads>python lab1complete.py

=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
Address: 1 Washington Square, San Jose
Phone: +1650-xxx-xxxx
=====

Main Menu:
1. Login
2. Change Password
3. Logout
Enter your choice: 1
Enter your email: student1@mysu.edu
Enter your password:

=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
=====

Check My Grade App Student's Menu:
1. Display Student Records
2. Display Courses
3. Show professor details by course ID
4. Check My Marks
5. Check My Grade
6. Logout
```

## Student's menu

```
Main Menu:
1. Login
2. Change Password
3. Logout
Enter your choice: 1
Enter your email: student1@mysu.edu
Enter your password:

=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
=====

Check My Grade App Student's Menu:
1. Display Student Records
2. Display Courses
3. Show professor details by course ID
4. Check My Marks
5. Check My Grade
6. Logout
Enter your choice: 1
Enter student email: student1@mysu.edu
Email ID: student1@mysu.edu
First Name: FirstName1
Last Name: LastName1
Course Details:
Course ID: DATA236, Grade: A, Marks: 90
Course ID: DATA228, Grade: B, Marks: 82
Course ID: DATA266, Grade: A, Marks: 92
Course ID: DATA350, Grade: C, Marks: 76
Search completed in 0.0013 seconds
```

Check My Grade App Student's Menu:

1. Display Student Records
2. Display Courses
3. Show professor details by course ID
4. Check My Marks
5. Check My Grade
6. Logout

Enter your choice: 2

Available courses:

-----

DATA220  
DATA226  
DATA228  
DATA230  
DATA236  
DATA245  
DATA255  
DATA266  
DATA270  
DATA275  
DATA280  
DATA290  
DATA300  
DATA310  
DATA320  
DATA330  
DATA340  
DATA350  
DATA360  
DATA200  
DATA300  
DATA301  
DATA302  
DATA303

Enter Course ID to view details: DATA200

Course Details:

Course ID: DATA200

Course Name: python

Description: basic data structure in python for applied data analytics

Credits: 3

```
=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
=====
```

Check My Grade App Student's Menu:

1. Display Student Records
2. Display Courses
3. Show professor details by course ID
4. Check My Marks
5. Check My Grade
6. Logout

Enter your choice: 3

Enter Course ID: DATA200

CSV Headers Found: ['Professor\_id', 'professor\_Name', 'Rank', 'course\_id']

Professor details for course ID 'DATA200':

Professor ID: proof1@mycsu.edu

Professor Name: proof1

Rank: senior professor

```
=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
=====
```

```
Check My Grade App Student's Menu:
1. Display Student Records
2. Display Courses
3. Show professor details by course ID
4. Check My Marks
5. Check My Grade
6. Logout
Enter your choice: 5
Enter student email: student2@mysu.edu
Grades for student2@mysu.edu:
Course ID: DATA280, Marks: 70, Assigned Grade: A
Course ID: DATA330, Marks: 19, Assigned Grade: C
Course ID: DATA310, Marks: 92, Assigned Grade: A
Course ID: DATA226, Marks: 70, Assigned Grade: C
Overall Student Grade: C
Operation completed in 0.0005 seconds
```

```
=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
=====
```

```
Check My Grade App Student's Menu:
1. Display Student Records
2. Display Courses
3. Show professor details by course ID
4. Check My Marks
5. Check My Grade
6. Logout
Enter your choice: 4
Enter student email: student1@mysu.edu
Marks for student1@mysu.edu:
Course ID: DATA236, Marks: 90, Mean: 73.81, Median: 75.00
Course ID: DATA228, Marks: 82, Mean: 73.97, Median: 83.00
Course ID: DATA266, Marks: 92, Mean: 71.43, Median: 78.00
Course ID: DATA350, Marks: 76, Mean: 67.06, Median: 72.00
Overall Student Mean: 85.00
Operation completed in 0.0705 seconds
```

```
=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
Address: 1 Washington Square, San Jose
Phone: +1650-xxx-xxxx
=====
```

```
Main Menu:
1. Login
2. Change Password
3. Logout
Enter your choice: 1
Enter your email: proof1@mycsu.edu
Enter your password:
```

```
=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
=====
```

```
Check My Grade App Professor Menu:
1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8. Modify Course Details
9. Add New Professor
10. Delete Professor
11. Modify Professor Details
12. Show Course Details by Professor
13. Add new user
14. Logout
Enter your choice: |
```

```
=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
=====
```

```
Check My Grade App Professor Menu:
1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8. Modify Course Details
9. Add New Professor
10. Delete Professor
11. Modify Professor Details
12. Show Course Details by Professor
13. Add new user
14. Logout
Enter your choice: 1
Enter Professor ID: proof1@mycsu.edu
Professor ID: proof1@mycsu.edu
Professor Name: proof1
Rank: senior professor
Courses: DATA220, DATA226, DATA200
```

```
=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
=====
```

Check My Grade App Professor Menu:

```
1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8. Modify Course Details
9. Add New Professor
10. Delete Professor
11. Modify Professor Details
12. Show Course Details by Professor
13. Add new user
14. Logout
Enter your choice: 2
Enter student email: student4@mycsu.edu
Email ID: student4@mycsu.edu
First Name: FirstName4
Last Name: LastName4
Course Details:
Course ID: DATA350, Grade: A, Marks: 91
Course ID: DATA228, Grade: D, Marks: 66
Course ID: DATA220, Grade: C, Marks: 79
Course ID: DATA230, Grade: C, Marks: 74
Search completed in 0.0000 seconds
```



=====

Welcome to Check My Grade App  
San Jose State University, Department of Data Analytics

=====

Check My Grade App Professor Menu:

1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8. Modify Course Details
9. Add New Professor
10. Delete Professor
11. Modify Professor Details
12. Show Course Details by Professor
13. Add new user
14. Logout

Enter your choice: 3  
Enter email: student251@mysu.edu  
Enter first name: FirstName251  
Enter last name: LastName251  
Enter Course ID, Grade, Marks: DATA200,C,79  
Enter Course ID, Grade, Marks: DATA220,B,81  
Enter Course ID, Grade, Marks: DATA228,B,85  
Enter Course ID, Grade, Marks: DATA350,B,87  
Student already exists.

=====

Welcome to Check My Grade App  
San Jose State University, Department of Data Analytics

=====

Check My Grade App Professor Menu:

1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8. Modify Course Details
9. Add New Professor
10. Delete Professor
11. Modify Professor Details
12. Show Course Details by Professor
13. Add new user
14. Logout

Enter your choice: 2  
Enter student email: student251@mysu.edu  
Email ID: student251@mysu.edu  
First Name: FirstName251  
Last Name: LastName251  
Course Details:  
Course ID: DATA236, Grade: A, Marks: 89  
Course ID: DATA228, Grade: A, Marks: 98  
Course ID: DATA266, Grade: C, Marks: 79  
Course ID: DATA350, Grade: B, Marks: 81  
Search completed in 0.0000 seconds

=====

Welcome to Check My Grade App  
San Jose State University, Department of Data Analytics

=====

```
Check My Grade App Professor Menu:
1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8. Modify Course Details
9. Add New Professor
10. Delete Professor
11. Modify Professor Details
12. Show Course Details by Professor
13. Add new user
14. Logout
Enter your choice: 3
Enter email: student252@mysu.edu
Enter first name: FirstName252
Enter last name: LastName252
Enter Course ID, Grade, Marks: DATA236,B,82
Enter Course ID, Grade, Marks: DATA228,A,93
Enter Course ID, Grade, Marks: DATA220,B,85
Enter Course ID, Grade, Marks: DATA350,B,84
Student added successfully.
```

=====

Welcome to Check My Grade App  
San Jose State University, Department of Data Analytics

=====

```
Check My Grade App Professor Menu:
1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8. Modify Course Details
9. Add New Professor
10. Delete Professor
11. Modify Professor Details
12. Show Course Details by Professor
13. Add new user
14. Logout
Enter your choice: 4
Enter student email to delete: student252@mysu.edu
Student deleted successfully.
```

=====

Welcome to Check My Grade App

San Jose State University, Department of Data Analytics

=====

Check My Grade App Professor Menu:

1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8. Modify Course Details
9. Add New Professor
10. Delete Professor
11. Modify Professor Details
12. Show Course Details by Professor
13. Add new user
14. Logout

Enter your choice: 2

Enter student email: student4@mysu.edu

Email ID: student4@mysu.edu

First Name: FirstName4

Last Name: LastName4

Course Details:

Course ID: DATA350, Grade: A, Marks: 91

Course ID: DATA228, Grade: D, Marks: 66

Course ID: DATA220, Grade: C, Marks: 79

Course ID: DATA230, Grade: C, Marks: 74

Search completed in 0.0157 seconds

=====

Welcome to Check My Grade App

San Jose State University, Department of Data Analytics

=====

Check My Grade App Professor Menu:

1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8. Modify Course Details
9. Add New Professor
10. Delete Professor
11. Modify Professor Details
12. Show Course Details by Professor
13. Add new user
14. Logout

Enter your choice: 5

Enter student email: student4@mysu.edu

Enter course ID to update: DATA350

Enter new grade: B

Enter new marks: 85

Record updated successfully

```
=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
=====
```

```
Check My Grade App Professor Menu:
1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8.Modify Course Details
9. Add New Professor
10.Delete Professor
11.Modify Professor Details
12.Show Course Details by Professor
13.Add new user
14.Logout
Enter your choice: 6
Enter Course ID: DATA201
Enter Course Name: COMPUTER ORGANIZATION
Enter Description: COMPUTER ARCHITECTURE
Enter Credits: 3
New course added successfully!
```

```
=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
=====
```

```
Check My Grade App Professor Menu:
1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8.Modify Course Details
9. Add New Professor
10.Delete Professor
11.Modify Professor Details
12.Show Course Details by Professor
13.Add new user
14.Logout
Enter your choice: 7
Enter Course ID to delete: DATA201
Course deleted successfully and updated in the file!
```

```

=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
=====

Check My Grade App Professor Menu:
1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8. Modify Course Details
9. Add New Professor
10. Delete Professor
11. Modify Professor Details
12. Show Course Details by Professor
13. Add new user
14. Logout
Enter your choice: 8
Enter Course ID to modify: DATA200

Enter new details (leave blank to keep existing values):
New Course Name (python): Python
New Description (basic data structure in python for applied data analytics): Basic data structure in python for applied data analytics
New Credits (3): 3
Course details updated successfully!

```

```

=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
=====

Check My Grade App Professor Menu:
1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8. Modify Course Details
9. Add New Professor
10. Delete Professor
11. Modify Professor Details
12. Show Course Details by Professor
13. Add new user
14. Logout
Enter your choice: 9
Enter Professor ID: proof12@mysu.edu
Enter Professor Name: proof12
Enter Rank: associate professor
Enter Course IDs (comma separated): DATA201
Professor added successfully.

```

```
=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
=====
```

```
Check My Grade App Professor Menu:
1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8. Modify Course Details
9. Add New Professor
10. Delete Professor
11. Modify Professor Details
12. Show Course Details by Professor
13. Add new user
14. Logout
Enter your choice: 10
Enter Professor ID to delete: proof12@myscu.edu
Professor deleted successfully.
```

```
=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
=====
```

```
Check My Grade App Professor Menu:
1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8. Modify Course Details
9. Add New Professor
10. Delete Professor
11. Modify Professor Details
12. Show Course Details by Professor
13. Add new user
14. Logout
Enter your choice: 11
Enter Professor ID to modify: proof1@myscu.edu
Enter new name (leave blank to keep unchanged):
Enter new rank (leave blank to keep unchanged):
Enter new Course IDs (comma separated, leave blank to keep unchanged):
Professor details modified successfully.
```

```

=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
=====

Check My Grade App Professor Menu:
1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8. Modify Course Details
9. Add New Professor
10. Delete Professor
11. Modify Professor Details
12. Show Course Details by Professor
13. Add new user
14. Logout
Enter your choice: 12
Enter Professor ID: proof3@mysu.edu
Professor proof3@mysu.edu teaches: DATA236, DATA245

Course Details:
Course ID: DATA236, Name: Distributed Systems for Data Engineering, Description: Covers the design and implementation of distributed systems in data engineering., Credits: 3
Course ID: DATA245, Name: Machine Learning Technologies, Description: Explores machine learning algorithms and their applications., Credits: 3

```

```

=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
=====

Check My Grade App Professor Menu:
1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8. Modify Course Details
9. Add New Professor
10. Delete Professor
11. Modify Professor Details
12. Show Course Details by Professor
13. Add new user
14. Logout
Enter your choice: 13
Enter new user email: student251@mysu.edu
Enter password for new user:
Enter role (student/professor): student
User 'student251@mysu.edu' added successfully!

```

```

=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
=====

Check My Grade App Professor Menu:
1. Display Professor Details
2. Display Student Records
3. Add New Student
4. Delete Student
5. Update Student Record
6. Add New Course
7. Delete Course
8. Modify Course Details
9. Add New Professor
10. Delete Professor
11. Modify Professor Details
12. Show Course Details by Professor
13. Add new user
14. Logout
Enter your choice: 14

=====
Welcome to Check My Grade App
San Jose State University, Department of Data Analytics
Address: 1 Washington Square, San Jose
Phone: +1650-xxx-xxxx
=====

Main Menu:
1. Login
2. Change Password
3. Logout
Enter your choice: 2
Enter your email: student5@mysu.edu
Enter new password:

```

## Testing

```
C:\Users\Hari\Downloads>python testlab1complete.py
Running tests...
Checking student records...
Total student records found: 1004
Warning: Expected 1000 records, but found 1004.
Sorting student records...
Sorting by marks took 0.0010 seconds
Sorting by email took 0.0000 seconds
Adding a new student...
Enter student email: student252@mycsu.edu
Enter first name: FirstName252
Enter last name: LastName252
Enter Course ID, Grade, Marks: DATA220,B,84
Student added successfully.
Updating student record...
Enter student email to update: student252@mycsu.edu
Enter course ID: DATA220
Enter new grade: C
Enter new marks: 78
Record updated successfully.
Deleting student record...
Enter student email to delete: student252@mycsu.edu
Student deleted successfully.
Adding a new course...
Enter Course ID: DAT201
Enter Course Name: Computer Science
Enter Description: CSE
Enter Credits: 3
New course added successfully!
Modifying course details...
```

```
Deleting a course...
Enter Course ID to delete: DATA201
Course deleted successfully and updated in the file!
Adding a new professor...
Enter Professor ID: proof12@mycsu.edu
Enter Professor Name: proof12
Enter Rank: associate
Enter Course IDs (comma separated): DATA201
Professor added successfully.
Modifying professor details...
Enter Professor ID to modify: proof12@mycsu.edu
Enter new name (leave blank to keep unchanged):
Enter new rank (leave blank to keep unchanged):
Enter new Course IDs (comma separated, leave blank to keep unchanged): DATA202
Professor details modified successfully.
Deleting a professor...
Enter Professor ID to delete: proof12@mycsu.edu
Professor deleted successfully.
All tests completed successfully!
```