USER MANUAL

1. Introduction

Program name: **Student Information System (SIS)**

- The application is console-based and operated through a menu system.

- Purpose: to manage students, courses, professors, enrollments, and grades, and to generate reports.
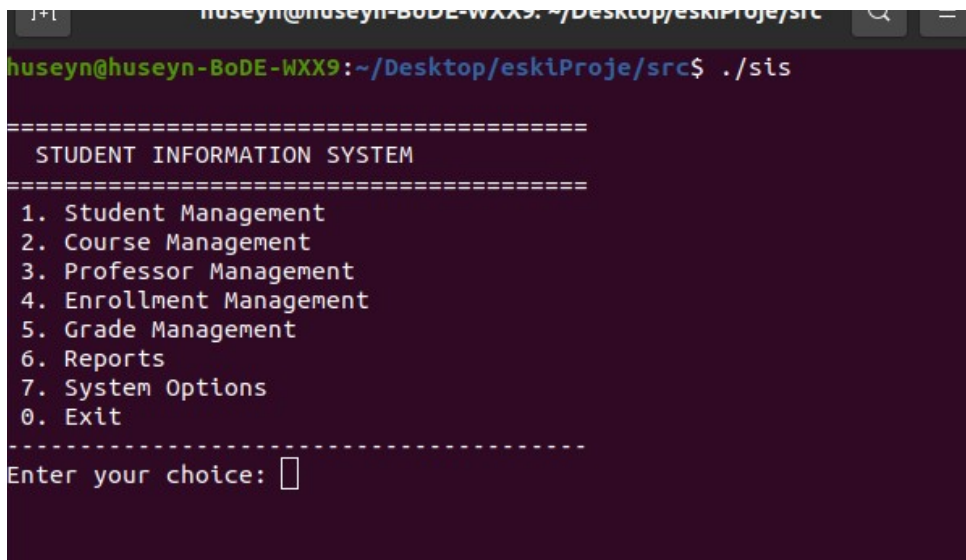
2. System Requirements and Execution

(This section is kept brief but is still included in the User Manual.)

- Operating System: Ubuntu / Linux

- Compilation: using **gcc**

3. Menu Structure and Navigation

When the program is executed, the user is presented with the main menu shown below:

The system operates entirely in a menu-based manner.
The user proceeds by entering the number corresponding to the desired operation.

4. Student Management User Guide

The **Student Management** module is used to manage all student-related operations in the system. Through this module, users can perform student addition, update, deletion, search, and transcript viewing operations.

From the main menu, **1. Student Management** is selected.

From the submenu, the **Add Student** option is chosen.

The system then requests the following information in order:

- Student ID
- First Name
- Last Name
- Email
- Phone Number
- Enrollment Year
- Department / Major

After all information is entered, the operation is confirmed.

Expected Outcome:

- All entered information is validated through verification checks.
- If the information is valid, the student is added to the system.
- A success message is displayed on the screen.

Possible Errors:

- If a duplicate Student ID is entered → **Student ID already exists**
- If the email format is invalid → **Invalid email format**
- If the phone number format is invalid → **Invalid phone number format**

```
huseyn@huseyn-BoDE-WXX9: ~/Desktop/eskiPro

===========================================
  STUDENT INFORMATION SYSTEM
===========================================
 1. Student Management
 2. Course Management
 3. Professor Management
 4. Enrollment Management
 5. Grade Management
 6. Reports
 7. System Options
 0. Exit
-----------------------------------------
Enter your choice: 1

================ Student Management ================
 1. Add Student
 2. Edit Student Infortmation
 3. Delete Student
 4. Search for student
 5. Display student details and transcript
 6. Calculate and Display student Gpa
 0. Back
===========================================
Enter your choice:
```

```
Enrollment year must be between 1900 and 2100.
Pleas try again
Enter student id: 1
Enter first name : 2020875
Enter last name : Hasan
Enter student mail  : Ali
Enter  student phone (format 555-####) : hasan@university.edu
Enter enrollment year : 1923
Enter student major : Computer Engineering
Student ID must be YEAR### (e.g., 2020001) and year must be 2020-2024.
Pleas try again
Enter student id: 2020675
Enter first name : Hasan
Enter last name : Ali
Enter student mail  : hasan@univerty.edu
Enter  student phone (format 555-####) : 555-2312
Enter enrollment year : Computer Engineering
Invalid year. Try again: 1923
Enter student major : Computer Engineering
Email must be a university email (must include @university.edu).
Pleas try again
Enter student id: 0
Enter first name : ^C
huseyn@huseyn-BoDE-WXX9:~/Desktop/eskiProje/src$
```

```
 0. Exit
-----------------------------------
Enter your choice: 1

=============== Student Management ================
 1. Add Student
 2. Edit Student Infortmation
 3. Delete Student
 4. Search for student
 5. Display student details and transcript
 6. Calculate and Display student Gpa
 0. Back
==================================================
Enter your choice: 1
Enter student id: 2020875
Enter first name : Hasan
Enter last name : Ali
Enter student mail  : hasan@university.edu
Enter  student phone (format 555-####) : 555-3423
Enter enrollment year : 20004
Enter student major : Computer Engineering
Enrollment year must be between 1900 and 2100.
Pleas try again
Enter student id: 1
```

```
 5. Display student details and transcript
 6. Calculate and Display student Gpa
 0. Back
==================================================
Enter your choice: 1
Enter student id: 2020458
Enter first name : Hasan
Enter last name : Ali
Enter student mail  : hasan@university.edu
Enter  student phone (format 555-####) : 555-2343
Enter enrollment year : 1923
Enter student major : Computer Engineering
Student added succesfullt
```

4.2 Update Student Information

Purpose:

To update the information of a student already registered in the system.

Steps:

- Enter the **Student Management** menu.
- Select the **Update Student** option.
- Enter the Student ID of the student to be updated.
- Update the desired fields.
- Confirm the operation.

Expected Outcome:

- The student information is successfully updated.
- The system displays a confirmation message to the user.

Possible Errors:

- If the student is not found → **Student not found**

4.3 Search Student

Purpose:

To search for a student registered in the system using the student ID.

Steps:

- Enter the **Student Management** menu.
- Select the **Search Student** option.
- Enter the Student ID of the student to be searched.

Expected Outcome:

- If the student exists, the student's information is displayed on the screen.
- The displayed information includes basic student details such as name, department, and enrollment year.

Possible Errors:

- If the student is not found → **Student not found**

```
 3. Search by Student Mail
   0. Back
Enter your choice: 2
Enter first name: Ahmet Yılmaz
Enter last name: Ahmet
Student not found.

----------Search Student----------
 1. Search by ID
 2. Search by Student Name
 3. Search by Student Mail
   0. Back
Enter your choice: 2
Enter first name: Ahmet
Enter last name: Yılmaz
Student information:
Student ID:        2020001
First Name:        Ahmet
Last Name:         Yılmaz
Mail:              ahmet.yilmaz@university.edu
Phone:             555-0101
Enrollment year:   2020
Major:             Computer Science
Gpa:               3.45

----------Search Student----------
 1. Search by ID
 2. Search by Student Name
 3. Search by Student Mail
   0. Back
Enter your choice: 
```

4.4 Delete Student

Purpose:
To remove a student registered in the system.

Steps:

- Enter the **Student Management** menu.

- Select the **Delete Student** option.

- Enter the Student ID of the student to be deleted.

- Confirm the deletion operation.

Expected Outcome:

- The student is successfully removed from the system.

- The system displays a confirmation message.

Possible Errors:

- If the student is not found → **Student not found**


```
Returning...

================ Student Management ================
 1. Add Student
 2. Edit Student Infortmation
 3. Delete Student
 4. Search for student
 5. Display student details and transcript
 6. Calculate and Display student Gpa
 0. Back
====================================================
Enter your choice: 3
Enter Student ID (YEAR###, e.g. 2020001): 2034567
Invalid Student ID! Must be YEAR### and year between 2020-2024.
Enter Student ID (YEAR###, e.g. 2020001): 20235667
Invalid Student ID! Must be YEAR### and year between 2020-2024.
Enter Student ID (YEAR###, e.g. 2020001): 2028875
Invalid Student ID! Must be YEAR### and year between 2020-2024.
```



```
huseyn@huseyn-BoDE-WXX9: ~/Desktop/eski

 5. Display student details and transcript
 6. Calculate and Display student Gpa
 0. Back
====================================================
Enter your choice: 3
Enter Student ID (YEAR###, e.g. 2020001): 2020001
Deleted student. Remove 0  grades , and 0 enrollment record

================ Student Management ================
 1. Add Student
 2. Edit Student Infortmation
 3. Delete Student
 4. Search for student
 5. Display student details and transcript
 6. Calculate and Display student Gpa
 0. Back
====================================================
Enter your choice: 3
Enter Student ID (YEAR###, e.g. 2020001): 2020002
Deleted student. Remove 0  grades , and 0 enrollment record

================ Student Management ================
 1. Add Student
 2. Edit Student Infortmation
 3. Delete Student
 4. Search for student
 5. Display student details and transcript
 6. Calculate and Display student Gpa
 0. Back
====================================================
Enter your choice: 
```

4.5 Display Student Details and Transcript

Purpose:
To display detailed information about a student along with their academic transcript.

Steps:

- Enter the **Student Management** menu.
- Select the **Display Student Details and Transcript** option.
- Enter the Student ID of the student.

Expected Outcome:

- The student's personal information is displayed.
- The student's transcript, including enrolled courses, grades, and semesters, is shown on the screen.

Possible Errors:

- If the student is not found → **Student not found**

4.6 Calculate and Display Student GPA

Purpose:
To calculate and display the Grade Point Average (GPA) of a student.

Steps:

- Enter the **Student Management** menu.
- Select the **Calculate and Display Student GPA** option.
- Enter the Student ID of the student.

Expected Outcome:

- The system calculates the student's GPA based on completed courses and grades.
- The calculated GPA is displayed on the screen.

Possible Errors:

- If the student is not found → **Student not found**
- If the student has no completed courses → **No completed courses found**

```
Student information:
Student ID:        2020003
First Name:        Mehmet
Last Name:         Demir
Mail:              mehmet.demir@university.edu
Phone:             555-0103
Enrollment year:   2020
Major:             Electrical Engineering
Gpa:               3.12


===========================================================================
                      ACADEMIC TRANSCRIPT
===========================================================================
Student: Mehmet Demir (ID:2020003)
Major: Electrical Engineering
Generated: Jan 16 2026
===========================================================================

Semester : 2020-FALL
Course Code  Course Name                      Cred   Ltr    Num    Status
---------------------------------------------------------------------------
CS101        Introduction to Programming       4     B      85.0   Completed
MATH101      Calculus I                        4     B+     87.5   Completed
PHY101       Physics I                         4     B-     81.0   Completed
---------------------------------------------------------------------------
Semester GPA : 3.38

Semester : 2021-SPRING
Course Code  Course Name                      Cred   Ltr    Num    Status
---------------------------------------------------------------------------
CS102        Data Structures                   4     B+     87.5   Completed
MATH102      Calculus II                       4     B      83.0   Completed
---------------------------------------------------------------------------
Semester GPA : 3.41


===========================================================================
                            SUMMARY
===========================================================================
Cumulative GPA: 3.39
```

```
===========================================================================
=============== Student Management ===============
 1. Add Student
 2. Edit Student Infortmation
 3. Delete Student
 4. Search for student
 5. Display student details and transcript
 6. Calculate and Display student Gpa
 0. Back
===========================================================================
Enter your choice: 6
Enter Student ID (YEAR###, e.g. 2020001): 2020001
Student gpa is 3.58

=============== Student Management ===============
 1. Add Student
 2. Edit Student Infortmation
 3. Delete Student
 4. Search for student
 5. Display student details and transcript
 6. Calculate and Display student Gpa
 0. Back
===========================================================================
Enter your choice: 
```

5. Course Management User Guide

5.1 Add Course

Purpose:
To add a new course to the system.

Steps:

- From the main menu, select **2. Course Management**.

- From the submenu, select **Add Course**.

- Enter the required course information (course ID, course code, course name, credit, capacity, department).

- Confirm the operation.

Expected Outcome:

- The entered information is validated.

- If valid, the course is added to the system.

- A success message is displayed.

Possible Errors:

- Duplicate course ID or course code → **Course already exists**

- Invalid credit or capacity value → **Invalid course information**

5.2 Edit Course Information

Purpose:
To update information of an existing course.

Steps:

- Enter the **Course Management** menu.

- Select **Edit Course Information**.

- Enter the Course ID of the course to be updated.

- Update the desired fields.

- Confirm the operation.

Expected Outcome:

- Course information is successfully updated.

- A confirmation message is displayed.

Possible Errors:

- Course not found → **Course not found**

5.3 Delete Course

Purpose:

To remove a course from the system.

Steps:

- Enter the **Course Management** menu.
- Select **Delete Course**.
- Enter the Course ID of the course to be deleted.
- Confirm the deletion.

Expected Outcome:

- The course is deleted successfully.
- A confirmation message is shown.

Possible Errors:

- Course not found → **Course not found**

5.4 Search for Courses

Purpose:

To search for a course using its course ID or course code.

Steps:

- Enter the **Course Management** menu.
- Select **Search for Courses**.
- Enter the course ID or course code.

Expected Outcome:

- If the course exists, course details are displayed.

Possible Errors:

- Course not found → **Course not found**

5.5 Set Course Capacity

Purpose:

To set or update the maximum number of students allowed for a course.

Steps:

- Enter the **Course Management** menu.

- Select **Set Course Capacity**.

- Enter the Course ID.

- Enter the new capacity value.

- Confirm the operation.

Expected Outcome:

- The course capacity is updated successfully.

- A confirmation message is displayed.

Possible Errors:

- Course not found → **Course not found**

- Invalid capacity value → **Invalid capacity**

5.6 Assign Prerequisites

Purpose:
To assign prerequisite courses to a course.

Steps:

- Enter the **Course Management** menu.

- Select **Assign Prerequisites**.

- Enter the Course ID.

- Enter the prerequisite course code(s).

- Confirm the operation.

Expected Outcome:

- Prerequisite information is assigned to the course.

- A confirmation message is displayed.

Possible Errors:

- Course not found → **Course not found**

- Invalid prerequisite course → **Invalid prerequisite**

5.7 Display Course Roster

Purpose:
To display the list of students enrolled in a course.

Steps:

- Enter the **Course Management** menu.

- Select **Display Course Roster**.

- Enter the Course ID.

Expected Outcome:

- A list of enrolled students is displayed.

- Student IDs and names are shown.

Possible Errors:

- Course not found → **Course not found**

- No students enrolled → **No students enrolled**

6. Professor Management User Guide

The **Professor Management** module is used to manage all professor-related operations in the system.
This module allows users to add, update, delete, search for professors, assign courses, and view teaching loads.

6.1 Add Professor

Purpose:
To add a new professor to the system.

Steps:

- From the main menu, select **3. Professor Management**.

- From the submenu, select **Add Professor**.

- Enter the required professor information (Professor ID, first name, last name, email, phone number, department).

- Confirm the operation.

Expected Outcome:

- The entered information is validated.

- If valid, the professor is added to the system.

- A success message is displayed.

Possible Errors:

- Duplicate Professor ID → **Professor ID already exists**

- Invalid email or phone format → **Invalid contact information**

6.2 Edit Professor Information

Purpose:
To update the information of an existing professor.

Steps:

- Enter the **Professor Management** menu.
- Select **Edit Professor Information**.
- Enter the Professor ID of the professor to be updated.
- Update the desired fields.
- Confirm the operation.

Expected Outcome:

- Professor information is successfully updated.
- A confirmation message is displayed.

Possible Errors:

- Professor not found → **Professor not found**

6.3 Delete Professor

Purpose:
To remove a professor from the system.

Steps:

- Enter the **Professor Management** menu.
- Select **Delete Professor**.
- Enter the Professor ID of the professor to be deleted.
- Confirm the deletion.

Expected Outcome:

- The professor is successfully removed from the system.
- A confirmation message is displayed.

Possible Errors:

- Professor not found → **Professor not found**

6.4 Search for Professor

Purpose:
To search for a professor using the Professor ID.

Steps:

- Enter the **Professor Management** menu.

- Select **Search for Professor**.

- Enter the Professor ID.

Expected Outcome:

- If the professor exists, the professor's information is displayed.

Possible Errors:

- Professor not found → **Professor not found**

6.5 Assign Course to Professo

Purpose:
To assign a course to a professor.

Steps:

- Enter the **Professor Management** menu.

- Select **Assign Course to Professor**.

- Enter the Professor ID.

- Enter the Course ID to be assigned.

- Confirm the operation.

Expected Outcome:

- The course is successfully assigned to the professor.

- A confirmation message is displayed.

Possible Errors:

- Professor not found → **Professor not found**

- Course not found → **Course not found**

6.6 Display Professor Course Load

Purpose:
To display the list of courses assigned to a professor.

Steps:

- Enter the **Professor Management** menu.

- Select **Display Professor Course Load**.

- Enter the Professor ID.

Expected Outcome:

- A list of courses taught by the professor is displayed.

Possible Errors:

- Professor not found → **Professor not found**
- No courses assigned → **No courses assigned**

7.1 Enroll Student in Course

Purpose:
To enroll a student in a specific course.

Steps:

- From the main menu, select **4. Enrollment Management**.
- Select **Enroll Student in Course**.
- Enter the Student ID.
- Enter the Course ID.
- Enter the semester information.
- Confirm the operation.

Expected Outcome:

- The system checks student existence, course existence, course capacity, and prerequisites.
- If all conditions are met, the student is enrolled in the course.
- A success message is displayed.

Possible Errors:

- Student not found → **Student not found**
- Course not found → **Course not found**
- Course capacity full → **Course capacity is full**
- Prerequisites not satisfied → **Prerequisites not completed**

7.2 Drop Student from Course

Purpose:
To remove a student from a course enrollment.

Steps:

- Enter the **Enrollment Management** menu.
- Select **Drop Student from Course**.
- Enter the Student ID.
- Enter the Course ID.

- Enter the semester information.
- Confirm the operation.

Expected Outcome:

- The student is successfully removed from the course.
- A confirmation message is displayed.

Possible Errors:

- Enrollment not found → **Enrollment not found**

7.3 Display Student Enrollments

Purpose:
To display all courses in which a student is enrolled.

Steps:

- Enter the **Enrollment Management** menu.
- Select **Display Student Enrollments**.
- Enter the Student ID.

Expected Outcome:

- A list of enrolled courses for the student is displayed, including course codes and semester information.

Possible Errors:

- Student not found → **Student not found**
- No enrollments found → **No enrollments found**

7.4 Display Course Roster

Purpose:
To display all students enrolled in a specific course.

Steps:

- Enter the **Enrollment Management** menu.
- Select **Display Course Roster**.
- Enter the Course ID.

Expected Outcome:

- A list of students enrolled in the selected course is displayed.

Possible Errors:

- Course not found → **Course not found**
- No students enrolled → **No students enrolled**

8. Grade Management User Guide

8.1 Record Grade

Purpose:
To record a grade for a student enrolled in a course.

Steps:

- From the main menu, select **5. Grade Management**.
- Select **Record Grade**.
- Enter the Student ID.
- Enter the Course ID.
- Enter the semester information.
- Enter the letter grade and numeric grade.
- Confirm the operation.

Expected Outcome:

- The system verifies the enrollment information.
- If valid, the grade is successfully recorded.
- A confirmation message is displayed.

Possible Errors:

- Student or course not found → **Student or course not found**
- Enrollment not found → **Enrollment not found**
- Invalid grade value → **Invalid grade**

8.2 Update Grade

Purpose:
To update an existing grade record.

Steps:

- Enter the **Grade Management** menu.
- Select **Update Grade**.
- Enter the Student ID.
- Enter the Course ID.
- Enter the semester information.
- Update the letter grade and/or numeric grade.
- Confirm the operation.

Expected Outcome:

- The grade information is successfully updated.
- A confirmation message is displayed.

Possible Errors:

- Grade record not found → **Grade not found**
- Invalid grade value → **Invalid grade**

8.3 Display Course Grade Statistics

Purpose:
To display statistical information about grades for a specific course.

Steps:

- Enter the **Grade Management** menu.
- Select **Display Course Grade Statistics**.
- Enter the Course ID.

Expected Outcome:

- Statistical data such as average, minimum, and maximum grades are displayed.

Possible Errors:

- Course not found → **Course not found**
- No grades recorded → **No grades available**

8.4 Display Grade Distribution

Purpose:
To display the distribution of letter grades for a course.

Steps:

- Enter the **Grade Management** menu.
- Select **Display Grade Distribution**.
- Enter the Course ID.

Expected Outcome:

- The distribution of grades (e.g., A, B, C, D, F) is displayed.

Possible Errors:

- Course not found → **Course not found**
- No grades recorded → **No grades available**

9. Reports User Guide

9.1 Student Transcript

Purpose:
To generate and display the academic transcript of a student.

Steps:

- From the main menu, select **6. Reports**.
- Select **Student Transcript**.
- Enter the Student ID.

Expected Outcome:

- The student's transcript is displayed, including semesters, courses, grades, and GPA.

Possible Errors:

- Student not found → **Student not found**
- No academic records available → **No records found**

9.2 Course Roster

Purpose:
To generate a list of students enrolled in a specific course.

Steps:

- Enter the **Reports** menu.
- Select **Course Roster**.
- Enter the Course ID.

Expected Outcome:

- A list of enrolled students is displayed.

Possible Errors:

- Course not found → **Course not found**
- No students enrolled → **No students enrolled**

9.3 Professor Course Load

Purpose:
To display the courses assigned to a professor.

Steps:

- Enter the **Reports** menu.
- Select **Professor Course Load**.

- Enter the Professor ID.

Expected Outcome:

- The list of courses taught by the professor is displayed.

Possible Errors:

- Professor not found → **Professor not found**
- No courses assigned → **No courses assigned**

9.4 Grade Statistics

Purpose:
To display statistical grade information for a course.

Steps:

- Enter the **Reports** menu.
- Select **Grade Statistics**.
- Enter the Course ID.

Expected Outcome:

- Grade statistics such as average, minimum, and maximum values are displayed.

Possible Errors:

- Course not found → **Course not found**
- No grades recorded → **No grades available**

10.1 Load All Data

Purpose:
To load all system data from stored files into memory.

Steps:

- From the main menu, select **7. System Management**.
- Select **Load All Data**.

Expected Outcome:

- All student, course, professor, enrollment, and grade data are loaded into the system.
- A confirmation message is displayed.

Possible Errors:

- Data files not found → **File not found**
- File read error → **Error reading data file**

10.2 Save All Data

Purpose:
To save all current system data to files.

Steps:

- Enter the **System Management** menu.

- Select **Save All Data**.

Expected Outcome:

- All system data is saved successfully.

- A confirmation message is displayed.

Possible Errors:

- File write error → **Error writing data file**

10.3 Backup Data

Purpose:
To create a backup copy of all system data.

Steps:

- Enter the **System Management** menu.

- Select **Backup Data**.

Expected Outcome:

- A backup of all data files is created.

- A confirmation message is displayed.

Possible Errors:

- Backup creation failed → **Backup failed**