Heshan sandaruwan
200304512443

```
import java.util.*;

class Student {
	String id;
	String name;
	double prfMark;
	double dbmMark;

	public Student() {

	}

	public Student(String id, String name, double prfMark, double dbmMark) {
		this.id = id;
		this.name = name;
		this.prfMark = prfMark;
		this.dbmMark = dbmMark;
	}
}
class StudentCollection {
	Student[] stList;
	int index;

	public StudentCollection(int size) {
		stList = new Student[size];
		index = -1;
	}
	private void capacity() {
       if (index == stList.length - 1) {
          Student[] newStList = new Student[stList.length + 1];
          System.arraycopy(stList, 0, newStList, 0, stList.length);
          stList = newStList;
       }
    }
    public void add(Student student) {
       capacity();
       stList[++index] = student;
    }
}
class courseWork2 {
	public static Scanner input = new Scanner(System.in);
	public static StudentCollection sc = new StudentCollection(0);

	private final static void clearConsole() {
		final String os = System.getProperty("os.name");
		try {
			if (os.equals("Linux")) {
			System.out.print("\033\143");
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                } else if (os.equals("Windows")) {
                                        new ProcessBuilder("cmd", "/c",
"cls").inheritIO().start().waitFor();
                } else {
                        System.out.print("\033[H\033[2J");
                        System.out.flush();
                }
                } catch (final Exception e) {
                                //handle the exception
                                System.err.println(e.getMessage());
                }
        }
   public static void homePage() {
                System.out.println("+--------------------------------------------------------------------------------
+\n|\t\t\tWELCOME TO GDSE MARKS MANAGEMENT SYSTEM\t\t     |\
n+-------------------------------------------------------------------------+");
                System.out.println("[1] Add New Student \t\t\t [2] Add New Student With Marks\
n[3] Add Marks \t\t\t\t [4] Update Student Details\n[5] Update Marks \t\t\t [6] Delete Student \n[7]
Print Student Details\t\t [8] Print Student Ranks\n[9] Best in Programming Fundementals \t [10]
Best in Database Management System");

                System.out.print("\nEnter an option to continue > ");
                int num = input.nextInt();

                clearConsole();

                switch(num){
                        case 1:
                        addNewStudent();
                        break;

                        case 2:
                        addNewStudentWithMarks();
                        break;

                        case 3:
                        addMarks();
                        break;

                        case 4:
                        updateStudentDetails();
                        break;

                        case 5:
                        updateMarks();
                        break;

                        case 6:
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```
                        deleteStudent();
                        break;

                        case 7:
                        printStudentDetails();
                        break;

                        case 8:
                        printStudentsRank();
                        break;

                        case 9:
                        bestInProgrammingFundamentals();
                        break;

                        case 10:
                        bestInDatabaseManagementSystem();
                        break;

                        default:
                        homePage();
                }
        }
        public static void addNewStudent() {
                System.out.print("+--------------------------------------------------------------------------------
+\n|\t\t\t\tADD NEW STUDENT\t\t\t\t\t|\
n+-------------------------------------------------------------------------------+");

                        do {
                        System.out.print("\n\nEnter Student ID     : ");
                        String id = input.next();

                        boolean found;
                        do {
                                found = false;
                                for (int i = 0; i <= sc.index; i++) {
                                        if (sc.stList[i].id.equals(id)) {
                                                found = true;
                                                System.out.println("The Student ID already exists");
                                                System.out.print("\nEnter Student ID: ");
                                                id = input.next();
                                                break;
                                        }
                                }
                        } while (found);

                        System.out.print("Enter Student name   : ");
                        String name = input.next();
```

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```
                    Student newStudent = new Student(id, name, 0, 0);

                    sc.add(newStudent);

                    System.out.print("\nStudent has been added successfully. Do you want to add another student? (Y/N): ");

                    while (true) {
                        char ynOption = input.next().charAt(0);

                        if (ynOption == 'Y' || ynOption == 'y') {
                            clearConsole();
                            addNewStudent();
                        } else if (ynOption == 'N' || ynOption == 'n') {
                            clearConsole();
                            homePage();
                            break;
                        } else {
                            System.out.print("Invalid input. Please enter 'Y' or 'N': ");
                        }
                    }
                } while (true);
            }
            public static void addNewStudentWithMarks() {
        System.out.print("+-------------------------------------------------------------------------------+\n|\t\t\t\tADD NEW STUDENT WITH MARKS\t\t\t\t|\n+-------------------------------------------------------------------------------+");

        do {
            System.out.print("\n\nEnter Student ID   : ");
            String id = input.next();

            boolean idExists;
            do {
                idExists = false;
                for (int i = 0; i <= sc.index; i++) {
                    if (sc.stList[i].id.equals(id)) {
                        idExists = true;
                        System.out.println("The Student ID already exists");
                        System.out.print("\nEnter Student ID: ");
                        id = input.next();
                        break;
                    }
                }
            } while (idExists);

            System.out.print("Enter Student name : ");
```

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```
        String name = input.next();

        double prfMark = getValidMark("Programming Fundamentals Marks   : ");
        double dbmMark = getValidMark("Database Management System Marks : ");

        Student newStudent = new Student(id, name, prfMark, dbmMark);

        sc.add(newStudent);

        System.out.print("\nStudent has been added successfully. Do you want to add a new
student? (Y/N): ");

        while (true) {
            char addOption = input.next().charAt(0);

            if (addOption == 'Y' || addOption == 'y') {
                clearConsole();
                addNewStudentWithMarks();
            } else if (addOption == 'N' || addOption == 'n') {
                clearConsole();
                homePage();
                return;
            } else {
                System.out.print("Invalid input. Please enter 'Y' or 'N': ");
            }
        }
    } while (true);
  }
  private static double getValidMark(String marks) {
      double mark = -1;

      while (mark < 0 || mark > 100) {
          System.out.print(marks);
          if (input.hasNextDouble()) {
              mark = input.nextDouble();
              if (mark < 0 || mark > 100) {
                  System.out.print("Invalid marks, please enter correct marks.\n\n");
              }
          } else {
              System.out.print("Invalid input. Please enter a valid numeric value.\n");
              input.next();
          }
      }
      return mark;
  }
        public static void addMarks() {
                System.out.print("+------------------------------------------------------------+\n|   \t  \t
ADD MARKS  \t\t\t      |\n+------------------------------------------------------------+");
```

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```
                boolean option = true;
                do {
                        System.out.print("\n\nEnter Student ID : ");
                        String id = input.next();
                        boolean found = false;
                        Student selectedStudent = null;

                        for (int i = 0; i <= sc.index; i++) {
                                if (sc.stList[i].id.equals(id)) {
                                        found = true;
                                        selectedStudent = sc.stList[i];
                                        System.out.println("Student Name     : " +
selectedStudent.name);

                                        if (selectedStudent.prfMark != 0 || selectedStudent.dbmMark !
= 0) {
                                                System.out.println("This student's marks have been
already added.\nIf you want to update the marks, please use [4] Update Marks option.");

                                                System.out.print("\nDo you want to add marks for
another student? (Y/N): ");
                                                option = addOption();
                                        } else {
                                                double prfMark = getValidMark("\nProgramming
Fundamentals Marks   : ");
                                                double dbmMark = getValidMark("Database
Management System Marks : ");

                                                selectedStudent.prfMark = prfMark;
                                                selectedStudent.dbmMark = dbmMark;

                                                System.out.print("Marks have been added. Do you
want to add marks for another student? (Y/N): ");
                                                option = addOption();
                                        }
                                }
                        }
                        if (!found) {
                                System.out.print("Invalid Student ID. Do you want to search again?
(Y/N): ");
                                option = handleSearchOption();
                        }
                } while (option);
        }
        private static boolean addOption() {
                char ynOption;

                while (true) {
```

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```
                        ynOption = input.next().charAt(0);
                        if (ynOption == 'Y' || ynOption == 'y') {
                                clearConsoleWithHeading();
                                return true;
                        } else if (ynOption == 'N' || ynOption == 'n') {
                                clearConsole();
                                homePage();
                                return false;
                        } else {
        System.out.print("Invalid input. Please enter 'Y' or 'N': ");
                        }
                }
        }
        private static boolean handleSearchOption() {
                char ynOption;

                while (true) {
                        ynOption = input.next().charAt(0);
                        if (ynOption == 'N' || ynOption == 'n') {
                                clearConsole();
                                homePage();
                                return false;
                        } else if (ynOption == 'Y' || ynOption == 'y') {
                                return true;
                        } else {
                                System.out.print("Invalid input. Please enter 'Y' or 'N': ");
                        }
                }
        }
        private static void clearConsoleWithHeading() {
                clearConsole();
                System.out.print("+--------------------------------------------------------------------------------
+\n|\t\t\t\tADD MARKS\t\t\t\t\t|\n+--------------------------------------------------------------------------------
+");
        }
        public static void updateStudentDetails() {
                System.out.print("+------------------------------------------------------------+\n|  \t  \t
UPDATE STUDENT DETAILS\t\t    |\n+------------------------------------------------------------+");
                boolean option = true;
   do {
      System.out.print("\n\nEnter Student ID : ");
      String id = input.next();
      boolean found = false;
      Student selectedStudent = null;

      for (int i = 0; i <= sc.index; i++) {
         if (sc.stList[i].id.equals(id)) {
            found = true;
```

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```
            selectedStudent = sc.stList[i];
            System.out.println("Student Name : " + selectedStudent.name);

            System.out.print("\nEnter the new student name: ");
            sc.stList[i].name = input.next();

            System.out.print("\nStudent details have been updated successfully!\nDo you want to
update another student's details? (Y/N) ");

            while (true) {
               char ynOption = input.next().charAt(0);

               if (ynOption == 'Y' || ynOption == 'y') {
                  option = true;
                  clearConsole();
                  updateStudentDetails();
               } else if (ynOption == 'N' || ynOption == 'n') {
                  option = false;
                  clearConsole();
                  homePage();
                  break;
               } else {
                  System.out.print("Invalid option. Please enter 'Y' or 'N': ");
               }
            }
         }
      }

      if (!found) {
         System.out.print("Can't find student ID. Try again!\n");
      }

   } while (option);
}
         public static void updateMarks() {
                  System.out.print("+------------------------------------------------------------+\n|   \t  \t
UPDTAE MARKS  \t\t\t      |\n+------------------------------------------------------------+");
                  boolean option = true;

   do {
      System.out.print("\n\nEnter Student ID : ");
      String id = input.next();
      boolean found = false;
      Student selectedStudent = null;

      for (int i = 0; i <= sc.index; i++) {
         if (sc.stList[i].id.equals(id)) {
            found = true;
```

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```
            selectedStudent = sc.stList[i];
            System.out.println("Student Name          : " + selectedStudent.name);

            if (selectedStudent.prfMark != 0.0 || selectedStudent.dbmMark != 0.0) {
                System.out.println("Programming Fundamentals Marks      : " +
selectedStudent.prfMark);
                System.out.println("Database Management System Marks     : " +
selectedStudent.dbmMark);
            } else {
                System.out.println("This student's marks yet to be added.");
                System.out.print("\nDo you want to update marks for another student? (Y/N): ");

                char addOption;

                while (true) {
                    addOption = input.next().charAt(0);
                    if (addOption == 'Y' || addOption == 'y') {
                        clearConsole();
                        updateMarks();
                        return;
                    } else if (addOption == 'N' || addOption == 'n') {
                        clearConsole();
                        homePage();
                        return;
                    } else {
                        System.out.print("Invalid input. Please enter 'Y' or 'N': ");
                    }
                }
            }

            double prfMark = getValidMark("\nEnter new Programming Fundamentals Marks   : ");
            double dbmMark = getValidMark("Enter new Database Management System Marks   : ");

            selectedStudent.prfMark = prfMark;
            selectedStudent.dbmMark = dbmMark;

            System.out.print("Marks have been updated successfully!\nDo you want to update marks
for another student? (Y/N): ");

            while (true) {
                char ynOption = input.next().charAt(0);

                if (ynOption == 'Y' || ynOption == 'y') {
                    option = true;
                    clearConsole();
                    updateMarks();
                } else if (ynOption == 'N' || ynOption == 'n') {
                    option = false;
```

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```
                    clearConsole();
                    homePage();
                    break;
                } else {
                    System.out.print("Invalid option. Please enter 'Y' or 'N': ");
                }
            }
        }

        if (!found) {
            System.out.print("Invalid Student ID. Do you want to search again? (Y/N): ");
           // option = searchOption();
        }
    } while (option);
}
        public static void deleteStudent() {
                System.out.print("+---------------------------------------------------------------+\n|   \t  \t
DELETE STUDENT  \t\t      |\n+---------------------------------------------------------------+");



                }
        public static void printStudentDetails() {
                System.out.print("+---------------------------------------------------------------+\n|  \t  \t
PRINT STUDENT DETAILS\t\t    |\n+---------------------------------------------------------------+");
                }
        public static void printStudentsRank() {
                System.out.print("+---------------------------------------------------------------+\n|  \t  \t
PRINT STUDENTS' RANKS\t\t    |\n+---------------------------------------------------------------+");
                }
        public static void bestInProgrammingFundamentals() {
                System.out.print("+---------------------------------------------------------------------+\n|  \t\t
BEST IN PROGRAMMING FUNDAMENTALS \t\t    |\
n+---------------------------------------------------------------------+");
                }
        public static void bestInDatabaseManagementSystem() {
                System.out.print("+---------------------------------------------------------------------+\n|  \t\t
BEST IN DATABASE MANAGEMENT SYSTEM \t\t    |\
n+---------------------------------------------------------------------+");
                }
        public static void main(String args[]) {
                StudentCollection sc = new StudentCollection(0);
                homePage();
        }
}
```