Student No : 2020/G/1038

INSTITUTE OF JAVA & SOFTWARE ENGINEERING

GRADUATE DIPLOMA IN SOFTWARE ENGINEERING

ASSIGNMENT NAME

Data Structure (DS) Assignment - An approach to OOP

STUDENT NAME: W.Dilshan Rajika

NIC: 980653285V

BATCH NO: 56

```
import java.util.*;
class Example{
//====================MAINMENUE=======================

public static void   mainmenue(String[]id,String []name,int []program,int []database){
Scanner input=new Scanner(System.in);
clearConsole();
System.out.println("\t---------------------------------------------------- ");
        System.out.println("\t|    WELCOME TO GDSE MARKS MANAGEMENT SYSTEM\t   |");
        System.out.println("\t-----------------------------------------------------\n ");
        System.out.println("    ");
        System.out.println("[1] Add New Student\t\t\t[2] Add Student With Marks");
        System.out.println("[3] Add Marks\t\t\t\t[4] Update Student Details");
        System.out.println("[5] Update Marks\t\t\t[6] Delete Student");
        System.out.println("[7] Print Student Details\t\t[8] Print Student Rank");
        System.out.println("[9] Best in programming Fundamental\t[10] Best in DataBase
Management System\n");
        System.out.print("Enter an option to continue >");
        final int option =input.nextInt();
        switch(option){
                case 1:AddNewStudent(id,name,program,database);break;
                case 2:AddStudentWithMarks(id,name,program,database);break;
                case 3:AddMarks(id,name,program,database);break;
                case 4:UpdateStudentDetails(id,name,program,database);break;
                case 5:UpdateMarks(id,name,program,database);break;
                case 6:DeleteStudent(id,name,program,database);break;
                case 7:PrintStudentDetails(id,name,program,database);break;
                case 8:PrintStudentRank(id,name,program,database);break;
                case 9:BestinprogrammingFundamental(id,name,program,database);break;
                case 10:BestinDataBaseManagementSystem(id,name,program,database);break;

                }
        }

//=======================================================
public final static void clearConsole() {
try {
final String os = System.getProperty("os.name");
if (os.contains("Windows")) {
new ProcessBuilder("cmd", "/c", "cls").inheritIO().start().waitFor();
} else {
System.out.print("\033[H\033[2J");
System.out.flush();
}
} catch (final Exception e) {
e.printStackTrace();
// Handle any exceptions.
}
}
```

```
public static int findNextIndex(String[] array){
int nextIndex=array.length;
for(int x=0;x<array.length;x++){
        if(array[x]==null){
        nextIndex=x;break;
        }
        }
        return nextIndex;
}
//=======================================================
        public static void AddNewStudent(String[]id,String []name,int
program[],int[]database){
Scanner input=new Scanner(System.in);
clearConsole();
        System.out.println("-----------------------------------------------------------------");
        System.out.println("|\t\t      ADD NEW STUDENT\t\t\t\t    |");
        System.out.println("-----------------------------------------------------------------");
        System.out.println("   ");
int index=findNextIndex(id);
int n=0;
String SID=null;
do{
        System.out.print("Enter Student ID : ");
 SID =input.nextLine();
        for(int x=0;x<index;x++){
                if(id[x].equals(SID)){
                        n=1;
                        System.out.println(" ");
                        System.out.println("This Student ID Already Exists.. ");
                        break;}else{
                                n=0;
                                }
                }
        }while(n!=0);{
        int nextindex=findNextIndex(id);
                id[nextindex]=SID;
        System.out.print("Enter Student Name : ");
        name[nextindex]=input.nextLine();
                }
        command1(id,name,program,database);
}

public static void command1(String[]id,String []name,int[]program,int[]database){
        Scanner input=new Scanner(System.in);
                System.out.println(" ");
                System.out.print("Student has been Add Successfully.Do you Want to Add New
Student?(Y/N)");
                String command=input.nextLine();
                switch(command){
                case "Y":clearConsole();AddNewStudent(id,name,program,database);break;
                case"N":clearConsole();mainmenue(id,name,program,database);break;
        }

}
```

```
//=====================================================
public static void AddStudentWithMarks(String[]id,String []name,int []program,int []database){
Scanner input=new Scanner(System.in);
        clearConsole();
        System.out.println("-------------------------------------------------------------------");
        System.out.println("|\t\t      ADD STUDENT WITH MARKS \t\t\t    |");
        System.out.println("-------------------------------------------------------------------");
        System.out.println("   ");
        int index=findNextIndex(id);
        int n=0;
        int nextindex=0;
        String SID=null;
do{
System.out.print("Enter Student ID : ");
  SID =input.nextLine();
        for(int x=0;x<index;x++){
                if(id[x].equals(SID)){
                        n=1;
                        System.out.println(" ");
                        System.out.println("This Student ID Already Exists.. ");
                        break;}else{
                                n=0;
                                }
        }

}while(n!=0);{
                 nextindex=findNextIndex(id);
                id[nextindex]=SID;
                nextindex=findNextIndex(name);
                System.out.print("Enter Student Name : ");
                name[nextindex]=input.nextLine();
                }int m=0;
                int program_marks=0;
                do{
                        System.out.print("Enter programming Fandamentals Marks :");
                   program_marks=input.nextInt();
                        if(program_marks<0||program_marks>100){
                                m=1;
                        System.out.println("Invalid Marks,Please Enter Correct Marks");
                                }else{ m=0;}
                        }while(m!=0);{
                                program[nextindex]=program_marks;
                                }
                                int num=0;
                int database1=0;
                do{
                        System.out.print("Enter Database Management System Marks :");
                         database1=input.nextInt();
                        if(database1<0||database1>100){
                                num=1;
                        System.out.println("Invalid Marks,Please Enter Correct Marks");
                                }else{ num=0;}

                        }while(num!=0);{
```

```
                                        database[nextindex]=database1;
                                        }
                                        command2(id,name,program,database);
        }
public static int findNextIndexMarks(int[] array){
int nextIndex=array.length;
for(int x=0;x<array.length;x++){
        if(array[x]==0){
        nextIndex=x;break;
        }
        }
        return nextIndex;
}
public static void command2(String[]id,String []name,int []program,int[]database){
        Scanner input=new Scanner(System.in);
        System.out.println(" ");
        System.out.print("Student has been Add Successfully.Do you Want to Add New
Student(Y/N)");
        String command=input.nextLine();
        switch(command){
                case
"Y":clearConsole();AddStudentWithMarks(id,name,program,database);break;
                case"N":clearConsole();mainmenue(id,name,program,database);break;
                }

        }
//=====================================================
public static void AddMarks(String[]id,String []name,int []program,int[]database){
        clearConsole();
        Scanner input=new Scanner(System.in);
         String searchID=null;
        int temp=0;
        System.out.println("-------------------------------------------------------------------");
        System.out.println("|\t\t          ADD MARKS \t\t\t\t    |");
        System.out.println("-------------------------------------------------------------------");
        System.out.println("   ");
        int num=0;
        int index=findNextIndex(id);
do{
System.out.print("Enter Student ID :");
        searchID=input.nextLine();
for(int x=0;x<index;x++){
        if(id[x].equals(searchID)){
                num=1;
                temp=x;
System.out.println(" Student Name   :"+name[temp]);
checkmarksadd(id,name,program,database,temp);
addmarks(id,name,program,database);
                }else{
                        num=0;

                        }
```

```
		}
}while(num!=0);{
		System.out.println(" ");
		System.out.print("Invalid Student ID.Do you Want to Search Again?(Y/N) ");
String option =input.nextLine();
		switch (option){
			case "Y":AddMarks(id,name,program,database);
			case "N":clearConsole();mainmenue(id,name,program,database);

			}
		}
}
public static void addmarks(String[]id,String []name,int []program,int[]database){
		Scanner input=new Scanner(System.in);
		  int m=0;
			int program_marks=0;
			do{
				System.out.print("Enter Programming Fandamentals Marks :");
				 program_marks=input.nextInt();
				if(program_marks<0||program_marks>100){
					m=1;
				System.out.println("Invalid Marks,please Enter Correct Marks");
					}else{ m=0;}

				}while(m!=0);{
					int index1=findNextIndexMarks(program);
					program[index1]=program_marks;
					}

			int num1=0;
			int database1=0;
			do{
				System.out.print("Enter Database Management System Marks :");
				 database1=input.nextInt();
				if(database1<0||database1>100){
					num1=1;
				System.out.println("Invalid Marks,please Enter Correct Marks");
					}else{ num1=0;}

				}while(num1!=0);{

					int index2=findNextIndexMarks(database);
					database[index2]=database1;
					}
					command3(id,name,program,database);
}
public static void command3(String[]id,String []name,int[]program,int[]database){
		Scanner input=new Scanner(System.in);
		System.out.println(" ");
		System.out.print("Marks have been Added Successfully.Do you Want to Add Marks for
Another Student?(Y/N)");
		String command=input.nextLine();
		switch(command){
			case "Y":clearConsole();AddMarks(id,name,program,database);break;
```

```
                case"N":clearConsole();mainmenue(id,name,program,database);break;
                }

        }
public static void checkmarksadd(String[]id,String []name,int []program,int[]database,int
temp){
Scanner input=new Scanner(System.in);
        String command=null;
        if(program[temp]>0&&0<database[temp]){
        System.out.println(" ");
        System.out.println("This Student Marks Already Added.");
        System.out.println("If you Want to Update the Marks,please use[4] Update Marks
Option\n");
        System.out.print("Do you Want to Add Marka for Anothr Student?(Y/N)");
         command=input.nextLine();
        switch(command){
                case "Y":clearConsole();AddMarks(id,name,program,database);
                case"N":clearConsole();mainmenue(id,name,program,database);
                }
                }
}
//=====================================================

public static void UpdateStudentDetails(String[]id,String []name,int []program,int []database){
        Scanner input=new Scanner(System.in);
   clearConsole();
    String searchID=null;
        int temp=0;
        int num=0;
        int index=findNextIndex(id);
        System.out.println("-------------------------------------------------------------------");
        System.out.println("|\t\t      UPDATE STUDENT DETAILS\t\t\t    |");
        System.out.println("-------------------------------------------------------------------");
        System.out.println("   ");
        do{
System.out.print("Enter Student ID :");
        searchID=input.nextLine();
for(int x=0;x<index;x++){
        if(id[x].equals(searchID)){
                num=1;
                temp=x;
System.out.println("Student Name :"+name[temp]);
System.out.print("Enter the new Student Name :");
String newname=input.nextLine();
name[temp]=newname;
System.out.println(" ");
System.out.print("Student Details has been Updated Successfully.");
System.out.print("Do you Want to Update Another Student Details?(Y/N)");
String command=input.nextLine();
switch (command){
                case "Y":UpdateStudentDetails(id,name,program,database);
                case "N":clearConsole();mainmenue(id,name,program,database);

                }
```

```
                }else{
                        num=0;

                        }

        }
}while(num!=0);{
        System.out.println(" ");
        System.out.print("Invalid Student ID.Do you Want to Search Again?(Y/N) ");
String option =input.nextLine();
        switch (option){
                case "Y":UpdateStudentDetails(id,name,program,database);
                case "N":clearConsole();mainmenue(id,name,program,database);

                }
        }

        }
//=================================================
public static void UpdateMarks(String[]id,String []name,int []program,int[]database){
        clearConsole();
        Scanner input=new Scanner(System.in);
         String searchID=null;
        int temp=0;
        int num=0;
        int index=findNextIndex(id);
        System.out.println("-------------------------------------------------------------------");
        System.out.println("|\t\t          UPDATE MARKS\t\t\t   |");
        System.out.println("-------------------------------------------------------------------");
        System.out.println("   ");
        do{
System.out.print("Enter Student ID :");
        searchID=input.nextLine();
for(int x=0;x<index;x++){
        if(id[x].equals(searchID)){
                num=1;
                temp=x;
System.out.println("Enter Student Name      :"+name[temp]);
checkmarks(id,name,program,database,temp);
System.out.println(" ");
System.out.print("Marks have been Updata Successfully.\nDo you Want to update Marks for
Another Student?(Y/N)");
String command=input.nextLine();
switch (command){
                case "Y":UpdateMarks(id,name,program,database);
                case "N":clearConsole();mainmenue(id,name,program,database);
                }

                }else{
                        num=0;

                        }
        }
```

```
}while(num!=0);{
        System.out.println(" ");
        System.out.print("Invalid Student ID.Do you Want to Search Again?(Y/N) ");
String option =input.nextLine();
        switch (option){
                case "Y":UpdateMarks(id,name,program,database);
                case "N":clearConsole();mainmenue(id,name,program,database);

                }
        }

}

public static void checkmarks(String[]id,String []name,int []program,int[]database,int temp){
        Scanner input=new Scanner(System.in);
          int number=0;
                do{
                        if(program[temp]==0&&database[temp]==0){
                                number=1;
                        System.out.println(" ");
                        System.out.println("This student's marks not yet to be added.");
                        System.out.print("Do you Want to Update Marka of  Anothr
Student?(Y/N)");
                        String  command=input.nextLine();
                        switch(command){
                        case "Y":clearConsole();UpdateMarks(id,name,program,database);
                        case"N":clearConsole();mainmenue(id,name,program,database);
                }
                                }else{ number=0;}

                        }while(number!=0);{
        System.out.println(" Programming Fandamentals Marks      :"+program[temp]);
        System.out.println("Database Management System Marks     :"+database[temp]);

                        }
          int m=0;
                int program_marks=0;
                do{
                        System.out.print("Enter Programming Fandamentals Marks :");
                         program_marks=input.nextInt();
                        if(program_marks<0||program_marks>100){
                                m=1;
                        System.out.println("Invalid Marks,please Enter Correct Marks");
                                }else{ m=0;}

                        }while(m!=0);{
                                program[temp]=program_marks;
                                }

                int num1=0;
                int database_marks=0;
                do{
                        System.out.print("Enter Database Management System Marks :");
                         database_marks=input.nextInt();
```

```
                        if(database_marks<0||database_marks>100){
                                num1=1;
                        System.out.println("Invalid Marks,please Enter Correct Marks");
                                }else{ num1=0;}

                        }while(num1!=0);{
                                        database[temp]=database_marks;
                                }
}
//=====================================================
public static void DeleteStudent(String[]id,String []name,int []program,int[]database){
        Scanner input=new Scanner(System.in);
        clearConsole();
        System.out.println("-------------------------------------------------------------------");
        System.out.println("|\t\t          DELETE STUDENT  \t\t\t   |");
        System.out.println("-------------------------------------------------------------------");
        System.out.println("   ");
         String searchID=null;
         int index=findNextIndex(id);
        int num=0;
int temp=0;
                do{
System.out.print("Enter Student ID :");
searchID=input.nextLine();
for(int x=0;x<index;x++){
        if(id[x].equals(searchID)){
                num=1;
                temp=x;
                deletestudent(id,name,program,database,temp);
System.out.println(" ");
System.out.print("Student has been Delete Successfully.\nDo you Want to Delete Another
Student?(Y/N) ");
String command=input.nextLine();
switch (command){
                case "Y":DeleteStudent(id,name,program,database);
                case "N":clearConsole();mainmenue(id,name,program,database);
                }
                }else{
                        num=0;
                        }
        }
}while(num!=0);{
        System.out.println(" ");
        System.out.print("Invalid Student ID.Do you Want to Search Again?(Y/N) ");
String option =input.nextLine();
        switch (option){
                case "Y":DeleteStudent(id,name,program,database);
                case "N":clearConsole();mainmenue(id,name,program,database);

                }
        }

        }
```

```
public static void  deletestudent(String[]id,String []name,int []program,int[]database,int temp){
                    int index=findNextIndex(id);
                    for(int i=temp; i<index;i++){
                                        id[i]=id[i+1];
                                        name[i]=name[i+1];
                                        program[i]=program[i+1];
                                        database[i]=database[i+1];
                              }
                    index--;
                    }
//=======================================================
public static void PrintStudentDetails(String[]id,String []name,int []program,int[]database){
          Scanner input=new Scanner(System.in);
clearConsole();
int num=0;
int temp=0;
double xr=2.00;
String searchID=null;
int index=findNextIndex(id);
          System.out.println("-------------------------------------------------------------------");
          System.out.println("|\t\t      Print Student Details     \t\t   |");
          System.out.println("-------------------------------------------------------------------");
          System.out.println("   ");
                    do{
System.out.print("Enter Student ID :");
          searchID=input.nextLine();

for(int x=0;x<index;x++){
          if(id[x].equals(searchID)){
                    num=1;
                    temp=x;
          System.out.println("Student Name :"+name[temp]);
          Markscheckadded(id,name,program,database,temp);

          System.out.println("+---------------------------------+---------------------------------+");
          System.out.println("|Programming Fundamentals Marks   |\t\t\t\t\t
"+program[temp]+"|");
          System.out.println("|Database Managment System Marks  |\t\t\t\t\t
"+database[temp]+"|");
          System.out.println("|Total Marks                                |\t\t\t\t   "
+(program[temp]+database[temp])+"|");
          System.out.println("|Average Marks                |\t\t\t\t\t
"+((program[temp]+database[temp])/xr)+"|");
          System.out.println("|Total. Marks                  | \t\t\t\t"
          +(program[temp]+database[temp])+" |");
          System.out.println("|Rank                          |\t\t\t\t "+"   |");
          System.out.println("+---------------------------------+---------------------------------+");
System.out.print("Do you Want to Search Another Student Detais?(Y/N)");
String option =input.nextLine();
switch (option){
                    case "Y":PrintStudentDetails(id,name,program,database);
                    case "N":clearConsole();mainmenue(id,name,program,database);
                    }
```

```
                }else{
                        num=0;

                        }
        }
}while(num!=0);{
        System.out.println(" ");
        System.out.print("Invalid Student ID.Do You Want to Search Again?(Y/N) ");
String option =input.nextLine();
        switch (option){
                case "Y":PrintStudentDetails(id,name,program,database);
                case "N":clearConsole();mainmenue(id,name,program,database);

                }
        }

                }
public static void Markscheckadded(String[]id,String []name,int []program,int[]database,int
temp){
Scanner input=new Scanner(System.in);
String command=null;
        if(program[temp]==0&&0==database[temp]){
        System.out.println(" ");
        System.out.println("THIS Student Marks Not Added. ");
        System.out.print("Do You Want to Search Again?(Y/N) ");
        System.out.print("Do you Want to Search Again?(Y/N) ");
        String option =input.nextLine();
        switch (option){
                case "Y":PrintStudentDetails(id,name,program,database);
                case "N":clearConsole();mainmenue(id,name,program,database);

                }
                }




        }
//=======================================================
public static void PrintStudentRank(String[]id,String []name,int []program,int[]database){
        Scanner input=new Scanner(System.in);
clearConsole();
double d=2.00;
        System.out.println("-------------------------------------------------------------------");
        System.out.println("|\t\t      Print Student Ranks\t\t\t   |");
        System.out.println("-------------------------------------------------------------------");
        System.out.println("   ");
        int index=findNextIndex(id);
        System.out.println("+-----------------------------------------------------------------+");
        System.out.println("|Rank   |  ID    |   Name    |   Total Marks   |   Avg.Marks|");
        System.out.println("+-----------------------------------------------------------------+");
        for(int x=0;x<index;x++){
```

```
		System.out.print("  "+(x+1)+"
\t\t"+id[x]+"\t"+name[x]+"\t\t"+(program[x]+database[x])+"\t\t
"+((program[x]+database[x])/d)+"\n");
			}

		System.out.println("+--------------------------------------------------------------------+");
			System.out.println(" ");
			System.out.print("Do you Want to Go Back to Main Menu?(Y/N):");
			String option=input.nextLine();
			switch(option){
				case "Y":clearConsole();mainmenue(id,name,program,database);
				case"N":PrintStudentRank(id,name,program,database);

				}

}


//=====================================================
public static void BestinprogrammingFundamental(String[]id,String []name,int
[]program,int[]database){
Scanner input=new Scanner(System.in);
clearConsole();
		System.out.println("----------------------------------------------------------------");
		System.out.println("|\t\tBEST IN PROGRAMMING FUNDAMENTALS\t\t   |");
		System.out.println("----------------------------------------------------------------");
		System.out.println("   ");
		System.out.println("+--------------------------------------------------------------+");
		System.out.println("|    ID   |  Name      |   PF marks    |   DBMS Marks      |");
		System.out.println("+--------------------------------------------------------------+");
				int index=findNextIndex(id);
				//int index=findNextIndexMarks(database);

			for(int i=0; i<index; i++){

		System.out.print("\t"+id[i]+"\t"+name[i]+"\t\t"+program[i]+"\t\t\t"+database[i]+"
\n");
			}
		System.out.println("+--------------------------------------------------------------+");
		System.out.println(" ");
		System.out.print("Do you Want to Go Back to Main Menu?(Y/N):");
			String option=input.nextLine();
			switch(option){
				case "Y":clearConsole();mainmenue(id,name,program,database);
				case"N":BestinprogrammingFundamental(id,name,program,database);
			}
		}

//=====================================================
public static void BestinDataBaseManagementSystem(String[]id,String []name,int
[]program,int[]database){
Scanner input=new Scanner(System.in);
clearConsole();
		System.out.println("----------------------------------------------------------------");
```

```
        System.out.println("|\t\tBEST IN DATABASE MANAGEMENT SYSTEM  \t\t   |");
        System.out.println("-------------------------------------------------------------------");
        System.out.println("   ");
        int index=findNextIndex(id);
        System.out.println("+-------------------------------------------------------------------+");
        System.out.println("|    ID   |  Name      |   PF marks    |   DBMS Marks      |");
        System.out.println("+-------------------------------------------------------------------+");

        for(int i=0; i<index; i++){

        System.out.print("\t"+id[i]+"\t"+name[i]+"\t\t"+program[i]+"\t\t\t"+database[i]+"
\n");
                }
        System.out.println("+-------------------------------------------------------------------+");

        System.out.println(" ");
        System.out.print("Do you Want to Go Back to Main Menu?(Y/N):");
                String option=input.nextLine();
                switch(option){
                        case "Y":clearConsole();mainmenue(id,name,program,database);
                        case
"N":BestinDataBaseManagementSystem(id,name,program,database);
                }
        }
//=====================================================
public static void main(String args[]){
Scanner input =new Scanner(System.in);
        System.out.print("[]");
        String heading=input.nextLine();
        String id[]=new String[1000];
        String name[]=new String[id.length];
        int program[]=new int[id.length];
        int database[]=new int[id.length];
        mainmenue(id,name,program,database);

}
}
```

Student No : 2020/G/1038

BATCH NO-56