```
import java.util.*;
class course{
        static String[] stuid=new String[0];
        static String[] studentName=new String[0];
        static int[] prfMarks=new int[0];
        static int[] dbmsMarks=new int[0];
        static int[] total;
        static char ch='|';
        public static void main(String args[]){
                WelcomeGdseMarkmanagementsystem();
        }
        public static void WelcomeGdseMarkmanagementsystem(){
                Scanner scanner=new Scanner(System.in);
                clearConsole();
                underscore(80);
                String str="WELCOME TO GDSE MARKS MANAGEMENT
SYSTEM";
                System.out.printf("%-1c%57s%22c\n",ch,str,ch);
                underscore(80);
                System.out.println("\n[1] Add New Student\t\t\t[2]
Add New 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 Ranks");
                System.out.println("[9] Best in Programming
Fundamentals\t[10] Best in Database Management System");
                System.out.print("\nEnter an option to continue >
");
                int option=scanner.nextInt();
                clearConsole();
                L1:switch(option){
                        case 1 :addNewStudent(scanner);break;
                        case
2 :addNewStudentWithMarks(scanner);break;
                        case 3 :addMarks(scanner);break;
                        case
4 :updateStudentDetails(scanner);break;
                        case 5 :updateMarks(scanner);break;
                        case 6 :deleteStudent(scanner);break;
                        case
7 :printStudentDetails(scanner);break;
                        case 8 :printStudentRanks(scanner);break;
                        case
9 :bestInProgrammingFundamentals(scanner);break;
                        case
10:bestInDatabaseManagementSystem(scanner);break;
                        default:System.out.println("Wrong
input.Try Again..");
                        }
        }
        public static void addNewStudent(Scanner scanner ){
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                L5:while(true){
                        underscore(80);
                        String str="ADD NEW STUDENT";

System.out.printf("%-1c%45s%34c\n",ch,str,ch);
                        underscore(80);
                        L2:do{
                                        System.out.print("\nEnter
Student Id   : ");
                                        String
stuId=scanner.next();
                                        if(!
stuIdValidation(stuId)){

System.out.println("Invalid Student ID.");
                                                continue L2;
                                        }

if(stuIdDublication(stuId)){

System.out.println("The Student ID already exists");
                                                continue L2;
                                        }
                                        System.out.print("Enter
Student Name : ");
                                        String
stuname=scanner.next();

stuIdandstuNameinsert(stuId,stuname);
                                        prfAndDbmsinsert(-1,-1);
                                        break;
                                }while(true);
                        System.out.print("\nStudent has been added
successfully. Do you want to add a new student (Y/n) ");
                        String yes=scanner.next();
                        yesOrNo(yes);
                }
        }
        public static void addNewStudentWithMarks(Scanner scanner){
                L4:while(true){
                        underscore(80);
                        String str="ADD NEW STUDENT WITH MARKS";

System.out.printf("%-1c%51s%28c\n",ch,str,ch);
                        underscore(80);
                        L1:do{
                                System.out.print("\nEnter Student
Id   : ");
                                String stuId=scanner.next();
                                if(!stuIdValidation(stuId)){

System.out.println("Invalid Student ID.");
                                        continue L1;
                                }
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                                    if(stuIdDublication(stuId)){

System.out.println("The Student ID already exists");
                                                continue L1;
                                    }
                                    System.out.print("Enter Student
Name : ");
                                    String stuname=scanner.next();
                                    int prfmarks=0,dbmsmarks=0;
                                    L3:while(true){

System.out.print("\nProgramming Fundamental Marks :");

prfmarks=scanner.nextInt();
                                                if(!
marksbetween0and100(prfmarks)){

System.out.println("Invalid marks.please enter correct marks.");
                                                                continue
L3;
                                                }else{break;}
                                            }
                                    L2:while(true){

System.out.print("DataBase Management System Marks :");

dbmsmarks=scanner.nextInt();
                                                if(!
marksbetween0and100(dbmsmarks)){

System.out.println("Invalid marks.please enter correct marks.\n");
                                                                continue
L2;
                                                }else{break;}
                                            }

stuIdandstuNameinsert(stuId,stuname);

prfAndDbmsinsert(prfmarks,dbmsmarks);
                                    break;
                            }while(true);
                            System.out.print("\nStudent has been added
successfully. Do you want to add a new student (Y/n) ");
                            String yes=scanner.next();
                            yesOrNo(yes);
                    }
            }
            public static void addMarks(Scanner scanner){
                    L4:while(true){
                            underscore(80);
                            String str="ADD MARKS";

System.out.printf("%-1c%40s%39c\n",ch,str,ch);
                            underscore(80);
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                        int index=0;
                        L6:do{
                                System.out.print("\nEnter Student
Id   : ");
                                String stuId=scanner.next();
                                L7:for(int i=0;i<stuid.length;i++)
{
                                        if(!
stuId.equals(stuid[i])){
                                                continue L7;
                                                }
else{index=i;break L6;}
                                        }
                                        System.out.print("Invalid
Student ID.Do you want to search again? (Y/n) ");
                                        String
yes=scanner.next();
                                        switch(yes){
                                                case
("n"):WelcomeGdseMarkmanagementsystem();
                                                case
("Y"):continue L6;
                                        }
                                }while(true);
                                System.out.print("Student
Name       : "+studentName[index]+"\n");
                        if (prfMarks[index]!=-1 &&
dbmsMarks[index]!=-1 ){
                                System.out.println("This student's
marks have been already added.\nIf you want to update the
marks,please use[4] Update Marks option.\n");
                                System.out.print("Do you want to
add marks for another student? (Y/n) ");
                                String yes=scanner.next();
                                yesOrNo(yes);
                                if("Y".equals(yes)){continue L4;}
                        }
                        int prfmarks,dbmsmarks;
                        L3:while(true){

System.out.print("\nProgramming Fundamental Marks :");

prfmarks=scanner.nextInt();
                                        if(!
marksbetween0and100(prfmarks)){

System.out.print("Invalid marks.please enter correct marks.\n");
                                                continue L3;
                                        } else{break;}
                                }
                        L2:while(true){

System.out.print("DataBase Management System Marks :");
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dbmsmarks=scanner.nextInt();
                                        if(!
marksbetween0and100(dbmsmarks)){

System.out.println("Invalid marks.please enter correct marks.\n");
                                                continue L2;
                                        }else{break;}
                                }
                        prfMarks[index]=prfmarks;
                        dbmsMarks[index]=dbmsmarks;
                        System.out.print("Marks have been added.Do
you want to add marks for another student ? (Y/n) ");
                        String yes=scanner.next();
                        yesOrNo(yes);
                }
          }
        public static void updateStudentDetails(Scanner scanner){
                L9:while(true){
                        underscore(80);
                        String str="UPDATE STUDENT DETAILS";

System.out.printf("%-1c%48s%31c\n",ch,str,ch);
                        underscore(80);
                        int index=0;
                        L8:do{
                                        System.out.print("\nEnter
Student Id   : ");
                                        String
stuId=scanner.next();
                                        L7:for(int
i=0;i<stuid.length;i++){
                                                if(!
stuId.equals(stuid[i])){
                                                        continue
L7;
                                                        }
else{index=i;break L8;}
                                                }

System.out.print("Invalid Student ID.Do you want to search again?
(Y/n) ");
                                                String
yes=scanner.next();
                                                switch(yes){
                                                        case
("n"):WelcomeGdseMarkmanagementsystem();
                                                        case
("Y"):continue L8;
                                                }
                                }while(true);
                        System.out.print("Student Name       :
"+studentName[index]+"\n");
                        System.out.print("\nEnter new student
name : ");
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                        String name=scanner.next();
                        studentName[index]=name;
                        System.out.print("\nStudent details has
been updated successfully.\nDo you want to update another student
datails? (Y/n) ");
                        String yes=scanner.next();
                        yesOrNo(yes);
                }
        }
        public static void updateMarks(Scanner scanner){
                L9:while(true){
                        underscore(80);
                        String str="UPDATE MARKS";

System.out.printf("%-1c%43s%36c\n",ch,str,ch);
                        underscore(80);
                        int index=0;
                        L8:do{
                                        System.out.print("\nEnter
Student Id   : ");
                                        String
stuId=scanner.next();
                                        L7:for(int
i=0;i<stuid.length;i++){
                                                if(!
stuId.equals(stuid[i])){
                                                        continue
L7;
                                                        }
else{index=i;break L8;}
                                                }

System.out.print("Invalid Student ID.Do you want to search again?
(Y/n) ");
                                                String
yes=scanner.next();
                                                switch(yes){
                                                        case
("n"):WelcomeGdseMarkmanagementsystem();
                                                        case
("Y"):continue L8;
                                                }
                                }while(true);
                        System.out.println("Student Name       :
"+studentName[index]+"\n");
                        if(prfMarks[index]==-1 &&
dbmsMarks[index]==-1 ){
                                System.out.print("This student's
marks yet to be added.\nDo you want to update the marks of another
student? (Y/n) : ");
                                String yes=scanner.next();
                                yesOrNo(yes);
                                if("Y".equals(yes)){continue L9;}
                        }else{
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                                System.out.println("Programming
Fundamentals Marks   : "+prfMarks[index]);
                                System.out.println("Database
Management System Marks : "+dbmsMarks[index]+"\n\n");
                                int prfmarks,dbmsmarks;
                                L3:while(true){
                                        System.out.print("Enter
new Programming Fundamental Marks :");

prfmarks=scanner.nextInt();
                                        if(!
marksbetween0and100(prfmarks)){

System.out.println("Invalid marks.please enter correct marks.\n");
                                                continue L3;
                                        }else{break;}
                                        }
                                L2:while(true){
                                        System.out.print("Enter
new DataBase Management System Marks :");

dbmsmarks=scanner.nextInt();
                                        if(!
marksbetween0and100(dbmsmarks)){

System.out.println("Invalid marks.please enter correct marks.\n");
                                                continue L2;
                                        }else{break;}
                                        }
                                prfMarks[index]=prfmarks;
                                dbmsMarks[index]=dbmsmarks;
                        }
                            System.out.print("Marks have been updated
successfully.\nDo you want to update another student? (Y/n): ");
                            String yes=scanner.next();
                            yesOrNo(yes);
                    }
            }
            public static void deleteStudent(Scanner scanner){
                    L9:while(true){
                            underscore(80);
                            String str="DELETE STUDENT";

System.out.printf("%-1c%45s%34c\n",ch,str,ch);
                            underscore(80);
                            int index=0;
                            L8:do{
                                        System.out.print("\nEnter
Student Id   : ");
                                        String
stuId=scanner.next();
                                        L7:for(int
i=0;i<stuid.length;i++){
                                                if(!
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stuId.equals(stuid[i])){
                                                                continue
L7;
                                                                }
else{index=i;break L8;}
                                                        }
                                                System.out.print("Invalid
Student ID.Do you want to search again? (Y/n) ");
                                                String
yes=scanner.next();
                                                switch(yes){
                                                case
("n"):WelcomeGdseMarkmanagementsystem();
                                                case ("Y"):continue L8;
                                                        }
                        }while(true);
                        deletestudentFromArray(index);
                        System.out.print("Student has been deleted
successfully.\nDo you want to delete another student? (Y/n): ");
                        String yes=scanner.next();
                        yesOrNo(yes);
                }
        }
        public static void printStudentDetails(Scanner scanner){
                L9:do{
                        underscore(57);
                        String str="PRINT STUDENT DETAILS";

System.out.printf("%-1c%38s%18c\n",ch,str,ch);
                        underscore(57);
                        int index=0,newindex=0;String stuId="";
                        L8:do{
                                                System.out.print("\nEnter
Student Id   : ");
                                                stuId=scanner.next();
                                                L7:for(int
i=0;i<stuid.length;i++){
                                                        if(!
stuId.equals(stuid[i])){
                                                                continue
L7;
                                                                }
else{index=i;break L8;}
                                                        }
                                                System.out.print("Invalid
Student ID.Do you want to search again? (Y/n) ");
                                                String
yes=scanner.next();
                                                switch(yes){
                                                        case
("n"):WelcomeGdseMarkmanagementsystem();
                                                        case
("Y"):continue L8;
                                                }
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```
                                }while(true);
                        System.out.println("Student Name       :
"+studentName[index]);
                        if(prfMarks[index]==-1 &&
dbmsMarks[index]==-1 ){
                                System.out.print("\nMarks yet to
be added.\n\nDo you want to search another student? (Y/n) ");
                                String yes=scanner.next();
                                yesOrNo(yes);
                                if("Y".equals(yes)){continue L9;}
                        }
                        String[]
copystuid=Arrays.copyOf(stuid,stuid.length);
                        totalmarksofstudent();
                        sortArrays(total);
                        L12:for(int i=0;i<stuid.length;i++){
                                                if(!
stuId.equals(stuid[i])){
                                                                continue
L12;
                                                                }
else{newindex=i;break L12;}
                        }
                        String str1="Programming Fundamentals
Marks",str2="Database Management System Marks",str3="Total
Marks",str4="Avg. Marks",str5="Rank";
                        tabel3();
                        System.out.printf("\n|
%-4s%5c%20d|",str1,ch,prfMarks[newindex]);
                        System.out.printf("\n|
%-4s%3c%20d|",str2,ch,dbmsMarks[newindex]);
                        System.out.printf("\n|
%-4s%24c%20d|",str3,ch,(total[newindex]));
                        System.out.printf("\n|
%-4s%25c%20.2f|",str4,ch,(total[newindex])/2.0);
                        System.out.printf("\n|%-4s%31c%12d%8s|
\n",str5,ch,(newindex+1),studentRanks(newindex));
                        tabel3();
                        System.out.print("\n\nDo you want to
search another student details? (Y/n) : ");
                        String yes=scanner.next();
                        yesOrNo(yes);
                }while(true);
        }
        public static void printStudentRanks(Scanner scanner){
                L9:do{
                        underscore(57);
                        String str="PRINT STUDENT'S RANKS";

System.out.printf("%-1c%38s%18c\n",ch,str,ch);
                        underscore(57);
                        totalmarksofstudent();
                        sortArrays(total);
                        System.out.print("\n");
```

```
                        tabel();
                        String
str1="Rank",str2="ID",str3="Name",str4="Total Marks",str5="Avg.
Marks";
                        System.out.printf("|%-5s|%-5s|%-20s|%-11s|
%-10s|\n",str1,str2,str3,str4,str5);
                        tabel();
                        L10:for (int i = 0; i < total.length; i++)
{
                                if(total[i]==-2){break L10;}
                                System.out.printf("|%-5d|%-5s|
%-20s|%11d|%10.2f|\n",(i+1),stuid[i],studentName[i],total[i],
(total[i]/2.0));
                        }
                        tabel();
                        System.out.print("\nDo you want to go back
to main menu? (Y/n) ");
                        String yes=scanner.next();
                        yesOrNo(yes);
                }while(true);
        }
        public static void bestInProgrammingFundamentals(Scanner
scanner){
                L9:do{
                        underscore(50);
                        String str="BEST IN PROGRAMMING
FUNDAMENTALS";

System.out.printf("%-1c%39s%10c\n",ch,str,ch);
                        underscore(50);
                        totalmarksofstudent();
                        sortArrays(prfMarks);
                        System.out.print("\n");
                        tabel1();
                        String str1="ID",str2="Name",str3="PRF
Marks",str4="DBMS Marks";
                        System.out.printf("\n|%-5s|%-21s|%-9s|
%-10s|\n",str1,str2,str3,str4);
                        tabel1();
                        L10:for (int i = 0; i < prfMarks.length;
i++){
                                if(prfMarks[i]==-1){break L10;}
                                System.out.printf("\n|%-5s|%-21s|
%-9d|%-10d|",stuid[i],studentName[i],prfMarks[i],dbmsMarks[i]);
                        }
                        System.out.print('\n');
                        tabel1();
                        System.out.print("\n\nDo you want to go
back to main menu? (Y/n) : ");
                        String yes=scanner.next();
                        yesOrNo2(yes);
                }while(true);
        }
        public static void bestInDatabaseManagementSystem(Scanner
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```
scanner){
                L9:do{
                        underscore(50);
                        String str="BEST IN DATABASE MANAGEMENT
SYSTEM";
                        char ch='|';

System.out.printf("%-1c%41s%8c\n",ch,str,ch);
                        underscore(50);
                        totalmarksofstudent();
                        sortArrays(dbmsMarks);
                        System.out.print("\n");
                        tabel2();
                        String str1="ID",str2="Name",str3="PRF
Marks",str4="DBMS Marks";
                        System.out.printf("\n|%-5s|%-21s|%-10s|
%-9s|\n",str1,str2,str4,str3);
                        tabel2();
                        L10:for (int i = 0; i < dbmsMarks.length;
i++){
                                if(dbmsMarks[i]==-1){break L10;}
                                System.out.printf("\n|%-5s|%-21s|
%-10d|%-9d|",stuid[i],studentName[i],dbmsMarks[i],prfMarks[i]);
                        }
                        System.out.print('\n');
                        tabel2();
                        System.out.print("\n\nDo you want to go
back to main menu? (Y/n) : ");
                        String yes=scanner.next();
                        yesOrNo2(yes);
                }while(true);
        }
        public static void tabel(){
                System.out.print("+");
                        for (int i = 0; i < 5; i++){
                                System.out.print("-");
                        }
                        System.out.print("+");
                        for (int i = 0; i < 5; i++){
                                System.out.print("-");
                        }
                        System.out.print("+");
                        for (int i = 0; i < 20; i++){
                                System.out.print("-");
                        }
                        System.out.print("+");
                        for (int i = 0; i < 11; i++){
                                System.out.print("-");
                        }
                        System.out.print("+");
                        for (int i = 0; i < 10; i++){
                                System.out.print("-");
                        }
                        System.out.print("+\n");
```

```
        }
public static void tabel1(){
        System.out.print("+");
        for (int i = 0; i < 5; i++){
                System.out.print("-");
        }
        System.out.print("+");
        for (int i = 0; i < 21; i++){
                System.out.print("-");
        }
        System.out.print("+");
        for (int i = 0; i < 9; i++){
                System.out.print("-");
        }
        System.out.print("+");
        for (int i = 0; i < 10; i++){
                System.out.print("-");
        }
        System.out.print("+");
}
public static void tabel2(){
        System.out.print("+");
        for (int i = 0; i < 5; i++){
                System.out.print("-");
        }
        System.out.print("+");
        for (int i = 0; i < 21; i++){
                System.out.print("-");
        }
        System.out.print("+");
        for (int i = 0; i < 10; i++){
                System.out.print("-");
        }
        System.out.print("+");
        for (int i = 0; i < 9; i++){
                System.out.print("-");
        }
        System.out.print("+");
}
public static void tabel3(){
        System.out.print("+");
                for (int i = 0; i < 34; i++){
                        System.out.print("-");
                }
                System.out.print("+");
                for (int i = 0; i < 20; i++){
                        System.out.print("-");
                }
                System.out.print("+");
        }
public static void underscore(int k){
        for (int i = 0; i <k; i++){
                System.out.print("-");
        }
```

```
                System.out.println();
        }
        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();
                }
        }
        public static boolean stuIdValidation(String stuId){
                boolean isValid=false;
                if(stuId.length()==4  && stuId.charAt(0)=='S'){
                        isValid=true;
                }
                String sNum=stuId.substring(1);
                char[] chars=sNum.toCharArray();
                for (int i = 0; i < chars.length; i++){
                        if(!Character.isDigit(chars[i])){
                                isValid=false;
                        }
                }
                return isValid;
        }
        public static boolean stuIdDublication(String stuId){
                boolean isCopy=false;
                for(int i=0;i<stuid.length;i++){
                        if(stuId.equals(stuid[i])){
                                isCopy=true;
                        }
                }
                return isCopy;
        }
        public static void yesOrNo(String yes){
                switch(yes){
                        case
("n"):WelcomeGdseMarkmanagementsystem();break;
                        case ("Y"):clearConsole();break;

default :WelcomeGdseMarkmanagementsystem();
                }
        }
        public static void yesOrNo2(String yes){
                switch(yes){
                        case
("Y"):WelcomeGdseMarkmanagementsystem();break;
                        case ("n"):clearConsole();break;
```

```
default :WelcomeGdseMarkmanagementsystem();
                }
        }
        public static void stuIdandstuNameinsert(String
stuId,String stuname){
                String[] temp=new String[stuid.length+1];
                String[] temp1=new String[studentName.length+1];
                for (int j = 0; j < stuid.length; j++){
                        temp[j]=stuid[j];
                        temp1[j]=studentName[j];
                }
                stuid=temp;
                studentName=temp1;
                stuid[stuid.length-1]=stuId;
                studentName[studentName.length-1]=stuname;
        }
        public static void prfAndDbmsinsert(int mprf,int mdbms){
                int[] temp2=new int[prfMarks.length+1];
                int[] temp3=new int[dbmsMarks.length+1];
                for (int j = 0; j < prfMarks.length; j++){
                        temp2[j]=prfMarks[j];
                        temp3[j]=dbmsMarks[j];
                }
                prfMarks=temp2;
                dbmsMarks=temp3;
                prfMarks[prfMarks.length-1]=mprf;
                dbmsMarks[dbmsMarks.length-1]=mdbms;
        }
        public static boolean marksbetween0and100(int marks){
                boolean validMarks=true;
                if(marks<0 || marks>100){
                        validMarks=false;
                }
                return validMarks;
        }
        public static void deletestudentFromArray(int index){
                String[] temp=new String[stuid.length-1];
                        String[] temp1=new
String[studentName.length-1];
                        int[] temp2=new int[prfMarks.length-1];
                        int[] temp3=new int[dbmsMarks.length-1];
                        for (int j = 0,i=0; j < temp.length; j+
+,i++){
                                if(i==index){i++;}
                                temp[j]=stuid[i];
                                temp1[j]=studentName[i];
                                temp2[j]=prfMarks[i];
                                temp3[j]=dbmsMarks[i];
                        }
                        stuid=temp;
                        studentName=temp1;
                        prfMarks=temp2;
                        dbmsMarks=temp3;
        }
```

```
        public static void totalmarksofstudent(){
                total=new int[stuid.length];
                for (int i = 0; i < stuid.length; i++){
                        total[i]=prfMarks[i]+dbmsMarks[i];
                }
        }
        public static void sortArrays(int[] a){
                for (int j = a.length-1; j >0; j--){
                                for (int i = 0; i <j ; i++){
                                        if(a[i]<a[i+1]){
                                                int
temp=prfMarks[i];
                                                int
temp3=dbmsMarks[i];
                                                String
temp1=stuid[i];
                                                String
temp2=studentName[i];
                                                int
temp4=total[i];

prfMarks[i]=prfMarks[i+1];

stuid[i]=stuid[i+1];

studentName[i]=studentName[i+1];

dbmsMarks[i]=dbmsMarks[i+1];

total[i]=total[i+1];

prfMarks[i+1]=temp;
                                                stuid[i+1]=temp1;

studentName[i+1]=temp2;

dbmsMarks[i+1]=temp3;
                                                total[i+1]=temp4;
                                        }
                                }
                        }
        }
        public static String studentRanks(int a){
                String str="";
                switch(a){
                        case 0:str="(First)";break;
                        case 1:str="(Second)";break;
                        case 2:str="(Third)";break;
                        case 3:str="(Fourth)";break;
                        case 4:str="(Fifth)";break;
                }
                return str;
        }
}
```