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CSE A

185001028

Q1. Write a java program to get ‘n’ elements in an array. Perform the linear and binary

search.\*/

import java.util.\*;

class functions{

void sort(int arr[],int size){

for(int i=0;i<size-1;i++){

for(int j=0;j<size-1;j++){

if(arr[j]>arr[j+1]){

int temp=arr[j];

arr[j]=arr[j+1];

arr[j+1]=temp;

}

}

}

}

int li\_search(int arr[],int size,int data){

int i=0;

while(arr[i]!=data){

i++;

if(i>size)

return -1;

}

return i;

}

int bi\_search(int arr[],int size,int data){

int start=0,pos;

int end=size-1;

sort(arr,size);

while(start<=end){

int mid=(start+end)/2;

if(arr[mid]==data){

pos=mid;

return pos;

}

else if(data>arr[mid]){

start=mid+1;

}

else{

end=mid-1;

}

}

return -1;

}

}

class searching{

public static void main(String args[]){

int []arr=new int[20];

Scanner s=new Scanner(System.in);

functions f=new functions();

System.out.print("Enter the size of array: ");

int len=s.nextInt();

System.out.print("Enter the elements: ");

for(int i=0;i<len;i++)

arr[i]=s.nextInt();

System.out.print("Enter the element to be searched: ");

int data=s.nextInt();

do{

System.out.print("Enter the search type\n1: Linear\n2: Binary\n");

int index=0,choice=s.nextInt();

switch(choice){

case 1: index=f.li\_search(arr,len,data);

break;

case 2: index=f.bi\_search(arr,len,data);

f.sort(arr,len);

System.out.print("Sorted array: ");

for(int i=0;i<len;i++)

System.out.print(arr[i]+" ");

System.out.println();

break;

}

if(index==-1)

System.out.println("Element Not Found!!");

else

System.out.println("index of "+data+" is "+index);

System.out.print("Enter the element to be searched(To STOP enter -999): ");

data=s.nextInt();

}while(data!=-999);

s.close();

}

}

/\*OUTPUT

cs1028@wtl4:~/Desktop/programs/1b$ java searching

Enter the size of array: 6

Enter the elements: 6 7 8 4 3 2

Enter the element to be searched: 3

Enter the search type

1: Linear

2: Binary

1

index of 3 is 4

Enter the element to be searched(To STOP enter -999): 8

Enter the search type

1: Linear

2: Binary

2

Sorted array: 2 3 4 6 7 8

index of 8 is 5

Enter the element to be searched(To STOP enter -999): 10

Enter the search type

1: Linear

2: Binary

1

Element Not Found!!

Enter the element to be searched(To STOP enter -999): -999

\*/

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/\* Q2. Write a java program to find matrix addition, subtraction and multiplication.\*/

import java.util.\*;

class MatrixOpr{

void mat\_add(int [][]mat1,int [][]mat2,int [][]res){

for(int i=0;i<mat1.length;i++)

for(int j=0;j<mat1[i].length;j++)

res[i][j] = mat1[i][j] + mat2[i][j];

}

void mat\_sub(int [][]mat1,int [][]mat2,int [][]res){

for(int i=0;i<mat1.length;i++)

for(int j=0;j<mat1[i].length;j++)

res[i][j] = mat1[i][j] - mat2[i][j];

}

void mat\_mul(int [][]mat1,int [][]mat2,int [][]res){

for(int i=0;i<mat1.length;i++){

for(int j=0;j<mat2[i].length;j++){

res[i][j]=0;

for(int k=0;k<mat2.length;k++)

res[i][j] += mat1[i][k] \* mat2[k][j];

}

}

}

}

class Ex1b\_Q2{

public static void main(String args[]){

Scanner s=new Scanner(System.in);

MatrixOpr f=new MatrixOpr();

int [][]mat1;

int [][]mat2;

int [][]res=new int[10][10];

int row1,col1,row2,col2;

System.out.print("Enter the number of rows and columns of 1st matrix: ");

row1=s.nextInt();

col1=s.nextInt();

mat1=new int[row1][col1];

for(int i=0;i<row1;i++){

System.out.println("Enter the elements of row "+(i+1)+": ");

for(int j=0;j<col1;j++)

mat1[i][j]=s.nextInt();

}

System.out.print("Enter the number of rows and columns of 2nd matrix: ");

row2=s.nextInt();

col2=s.nextInt();

mat2=new int[row2][col2];

for(int i=0;i<row2;i++){

System.out.println("Enter the elements of row "+(i+1)+": ");

for(int j=0;j<col2;j++)

mat2[i][j]=s.nextInt();

}

int choice;

System.out.print("Enter the operation:\n1: Addition\n2: Subtraction\n3: Multiplication\n");

choice=s.nextInt();

do{

switch(choice){

case 1:if(row1==row2 && col1==col2){

res=new int[row1][col1];

f.mat\_add(mat1,mat2,res);

System.out.println("Output Matrix");

for(int i=0;i<res.length;i++){

for(int j=0;j<res[i].length;j++)

System.out.print(res[i][j]+" ");

System.out.println();

}

}

else{

System.out.println("Addition Not Possible!!");

}

break;

case 2:if(row1==row2 && col1==col2){

res=new int[row1][col1];

f.mat\_sub(mat1,mat2,res);

System.out.println("Output Matrix");

for(int i=0;i<res.length;i++){

for(int j=0;j<res[i].length;j++)

System.out.print(res[i][j]+" ");

System.out.println();

}

}

else{

System.out.println("Subtraction Not Possible!!");

}

break;

case 3:if(col1==row2){

res=new int[row1][col2];

f.mat\_mul(mat1,mat2,res);

System.out.println("Output Matrix");

for(int i=0;i<res.length;i++){

for(int j=0;j<res[i].length;j++)

System.out.print(res[i][j]+" ");

System.out.println();

}

}

else{

System.out.println("Multiplication Not Possible!!");

}

break;

}

System.out.print("\nEnter the operation:\n1: Addition\n2: Subtraction\n3: Multiplication\nTo STOP enter -1\n");

choice=s.nextInt();

}while(choice!=-1);

}

}

/\*OUTPUT

cs1028@wtl4:~/Desktop/programs/1b$ java Ex1b\_Q2

Enter the number of rows and columns of 1st matrix: 2 3

Enter the elements of row 1:

1 2 3

Enter the elements of row 2:

4 5 6

Enter the number of rows and columns of 2nd matrix: 3 2

Enter the elements of row 1:

1 2

Enter the elements of row 2:

3 4

Enter the elements of row 3:

5 6

Enter the operation:

1: Addition

2: Subtraction

3: Multiplication

3

Output Matrix

22 28

49 64

Enter the operation:

1: Addition

2: Subtraction

3: Multiplication

To STOP enter -1

-1

cs1028@wtl4:~/Desktop/programs/1b$ java Ex1b\_Q2

Enter the number of rows and columns of 1st matrix: 3 3

Enter the elements of row 1:

1 2 3

Enter the elements of row 2:

4 5 6

Enter the elements of row 3:

7 8 9

Enter the number of rows and columns of 2nd matrix: 3 3

Enter the elements of row 1:

1 2 3

Enter the elements of row 2:

4 5 6

Enter the elements of row 3:

7 8 9

Enter the operation:

1: Addition

2: Subtraction

3: Multiplication

1

Output Matrix

2 4 6

8 10 12

14 16 18

Enter the operation:

1: Addition

2: Subtraction

3: Multiplication

To STOP enter -1

2

Output Matrix

0 0 0

0 0 0

0 0 0

Enter the operation:

1: Addition

2: Subtraction

3: Multiplication

To STOP enter -1

-1

\*/

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/\* Develop a Java application to generate Electricity bill. Create a class with the

following members: Consumer no., consumer name, previous month reading,

current month reading, type of EB connection (i.e domestic or commercial).

Compute the bill amount using the following tariff.

If the type of the EB connection is domestic, calculate the amount to be paid as

follows:

First 100 units - Rs. 1 per unit

101-200 units - Rs. 2.50 per unit

201 -500 units - Rs. 4 per unit

501 units - Rs. 6 per unit

If the type of the EB connection is commercial, calculate the amount to be paid as

follows:

First 100 units - Rs. 2 per unit

101-200 units - Rs. 4.50 per unit

201 -500 units - Rs. 6 per unit

501 units - Rs. 7 per unit \*/

import java.util.\*;

class EbillData{

int consumer\_number;

String consumer\_name,type;

double pmr,cmr;

EbillData(int cnum,String cname,double pmr,double cmr,String type){

consumer\_number=cnum;

consumer\_name=cname;

this.pmr=pmr;

this.cmr=cmr;

this.type=type;

}

double domestic\_bill(double units){

double bill=0;

if(units<=100)

bill = 1 \* units;

else if(units>100 && units<=200)

bill=100 + (units-100) \* 2.5;

else if(units>200 && units<=500)

bill=100 + (100\*2.5) + (units-200)\*4;

else if(units>500)

bill=350 + (300\*4) + (units-500)\*6;

return bill;

}

double commercial\_bill(double units){

double bill=0;

if(units<=100)

bill = 2 \* units;

else if(units>100 && units<=200)

bill=200 + (units-100) \* 4.5;

else if(units>200 && units<=500)

bill=200 + (100\*4.5) + (units-200)\*6;

else if(units>500)

bill=650 + (300\*6) + (units-500)\*7;

return bill;

}

}

class Ex1b\_Q3{

public static void main(String args[]){

Scanner s=new Scanner(System.in);

int consumer\_number;

String consumer\_name,type;

double pmr,cmr,units,bill=0;

System.out.print("Enter the Consumer Number: ");

consumer\_number=s.nextInt();

s.nextLine();

System.out.print("Enter the Consumer Name: ");

consumer\_name=s.nextLine();

System.out.print("Enter the Consumer type: ");

type=s.nextLine();

System.out.print("Enter the previous month reading: ");

pmr=s.nextDouble();

System.out.print("Enter the current month reading: ");

cmr=s.nextDouble();

EbillData eb=new EbillData(consumer\_number,consumer\_name,pmr,cmr,type);

if(eb.type.equalsIgnoreCase("domestic")){

units=cmr-pmr;

bill=eb.domestic\_bill(units);

}

else if(eb.type.equalsIgnoreCase("commercial")){

units=cmr-pmr;

bill=eb.commercial\_bill(units);

}

System.out.println("Consumer Number: "+eb.consumer\_number+"\nConsumer Name: "+eb.consumer\_name+"\nConsumer Type: "+eb.type+"\nPMR: "+eb.pmr+"\nCMR: "+eb.cmr+"\nBill: "+bill);

s.close();

}

}

/\*OUTPUT

Enter the Consumer Number: 256

Enter the Consumer Name: John

Enter the Consumer type: Domestic

Enter the previous month reading: 276

Enter the current month reading: 549

Consumer Number: 256

Consumer Name: John

Consumer Type: Domestic

PMR: 276.0

CMR: 549.0

Bill: 642.0

Enter the Consumer Number: 8756

Enter the Consumer Name: Peter

Enter the Consumer type: Commercial

Enter the previous month reading: 547

Enter the current month reading: 995

Consumer Number: 8756

Consumer Name: Peter

Consumer Type: Commercial

PMR: 547.0

CMR: 995.0

Bill: 2138.0

\*/

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/\*Write a java program to create a class named ‘Student’ with name, id, dept, 3 marks

as data members. Write function to assign the inputs, calculate grade, display and

search. Perform these operations for ‘n’ number of students. [Search using id and

dept – use method overloading] \*/

import java.util.\*;

class student{

String name,dept,grade;

int id;

int m1,m2,m3;

void input(){

Scanner s = new Scanner(System.in);

System.out.print("Enter Name: ");

name = s.nextLine();

System.out.print("Enter Dept: ");

dept = s.nextLine();

System.out.print("Enter ID: ");

id = s.nextInt();

System.out.print("Enter marks: ");

m1 = s.nextInt();

m2 = s.nextInt();

m3 = s.nextInt();

}

void grades(){

int avg = (m1+m2+m3)/3;

if (avg>=90)

grade = "A";

else if (avg>=80 && avg<90)

grade = "B";

else if (avg>=70 && avg<80)

grade = "C";

else if (avg>=60 && avg<70)

grade = "D";

else

grade = "F";

}

void display(){

System.out.println(name+"\t"+dept+"\t"+id+"\t"+m1+" "+m2+" "+m3+"\t"+grade);

}

}

class Ex1b\_Q4{

public static void main(String argv[]){

Scanner sc = new Scanner(System.in);

System.out.print("Enter the number of students: ");

int num= sc.nextInt();

student std[]=new student[num];

for(int i=0;i<num;i++)

std[i] = new student();

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

std[i].input();

}

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

std[i].grades();

}

int choice;

System.out.println("\n1.Display\n2.Search");

System.out.print("Enter Your choice: ");

choice = sc.nextInt();

do{

switch(choice){

case 1: System.out.println("Name\tDept\tID\tMarks\t\tGrades");

for(int i= 0; i<num;i++)

std[i].display();

break;

case 2: System.out.println("\n1: Search by ID\n2: Search by Department");

int choice2;

System.out.print("Enter your choice: ");

choice2 = sc.nextInt();

switch(choice2){

case 1: int sId;

System.out.print("Enter the id: ");

sId = sc.nextInt();

search(sId, num, std);

break;

case 2: String sDept;

sc.nextLine();

System.out.print("Enter the dept: ");

sDept = sc.nextLine();

search(sDept, num, std);

break;

}

}

System.out.println("\n1.Display\n2.Search");

System.out.print("Enter Your choice(To stop enter -1): ");

choice = sc.nextInt();

}while(choice != -1);

sc.close();

}

public static void search(int Id, int num,student st[]){

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

if(st[i].id== Id){

System.out.println("Name\tDept\tID\tMarks\t\tGrade");

System.out.println(st[i].name+"\t"+ st[i].dept+"\t"+ st[i].id+"\t"+ st[i].m1+" "+ st[i].m2+" "+ st[i].m3+"\t"+st[i].grade);

}

}

}

public static void search(String dept, int num,student st[]) {

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

if (st[i].dept.equalsIgnoreCase(dept)) {

System.out.println("Name\tDept\tID\tMarks\t\tGrade");

System.out.println(st[i].name+"\t"+st[i].dept+"\t"+ st[i].id+"\t"+st[i].m1+ " "+st[i].m2+" "+st[i].m3+"\t"+st[i].grade);

}

}

}

}

/\*OUTPUT

Enter the number of students: 5

Enter Name: John

Enter Dept: CSE

Enter ID: 26

Enter marks: 92 90 86

Enter Name: Peter

Enter Dept: ECE

Enter ID: 67

Enter marks: 77 82 81

Enter Name: Marques

Enter Dept: CSE

Enter ID: 55

Enter marks: 95 92 91

Enter Name: Dave

Enter Dept: CIVIL

Enter ID: 23

Enter marks: 88 90 90

Enter Name: Gaurav

Enter Dept: EEE

Enter ID: 54

Enter marks: 87 97 99

1.Display

2.Search

Enter Your choice: 1

Name Dept ID Marks Grades

John CSE 26 92 90 86 B

Peter ECE 67 77 82 81 B

Marques CSE 55 95 92 91 A

Dave CIVIL 23 88 90 90 B

Gaurav EEE 54 87 97 99 A

1.Display

2.Search

Enter Your choice(To stop enter -1): 2

1: Search by ID

2: Search by Department

Enter your choice: 1

Enter the id: 67

Name Dept ID Marks Grade

Peter ECE 67 77 82 81 B

1.Display

2.Search

Enter Your choice(To stop enter -1): 2

1: Search by ID

2: Search by Department

Enter your choice: 2

Enter the dept: cse

Name Dept ID Marks Grade

John CSE 26 92 90 86 B

Name Dept ID Marks Grade

Marques CSE 55 95 92 91 A

1.Display

2.Search

Enter Your choice(To stop enter -1): -1

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