20MCA011

AMAL T S

OOPS-LAB CYCLE 2

EXPERIMENT 1 : SORT STRINGS

AIM: Program to Sort strings – don't use sort () method

ALGORITHM

1.Define class Sort_String with the main function.

2.Inside the main function define the variables temp,n.

3.Get the data from the user including the number of strings and string .

4. Compare the elements of the array.

5. If the first element is greater than the second swap them.

6.Repeat step 4 and 5 until the end of the array.

7.Print the sorted array.

PROGRAM

```
import java.util.*;


class Sort
{
public static void main(String args[])
{
int n;
String temp;
Scanner s = new Scanner(System.in);
System.out.print("enter the number of strings : ");
n=s.nextInt();
String str[] = new String[n];
System.out.println("enter the strings : ");
for(int i=0; i<n; i++)
{
str[i] = s.next();
```

```
}
for(int i=0 ; i<n ; i++)
{
for (int j=i+1 ; j<n ; j++)
{
if (str[i].compareTo(str[j])>0)
{
temp=str[i];
str[i]=str[j];
str[j]=temp;
}
}
}
System.out.println("strings in sorted order : ");
for (int i=0 ; i<n-1; i++)
{
System.out.println(str[i]);
}
System.out.print(str[n-1]);
}
}
```

OUTPUT

```
enter the number of strings : 4
enter the strings :
zxy
pqrs
amal
ybr
strings in sorted order :
amal
pqrs
ybr
zxy
E:\MCA\Sem 2 Lab\JAVA\Sem2_Java\lab cycle 2\01.Sort>
```

EXPERIMENT 2 :SEARCH ELEMENT

AIM: Search an element in an array - write a menu driven program to perform both linear search and binary search of a string in a String array.

ALGORITHM

1.Define class with the main function.
2.Inside the main function define the variables i,n,ch,search and initialize the variables flag=0.
3.Get the data from the user like the limit of the array, elements in the array.
4.select the choice from the menu and the element to be searched.
5. For each element in str[i] if a[i]==searched element then print the position of the element by linear search and binary search.
6.Exit.

PROGRAM

```
import java.util.Arrays;
import java.util.Scanner;
class Search_Element
{
public static void main(String args[])
{
Scanner s=new Scanner(System.in);
int i,n,ch,flag=0;
String search;
System.out.print("enter the limit : ");
n=s.nextInt();
String str[]=new String[n];
System.out.println("enter all the elements : ");
for(i=0; i<n; i++)
```

```
{
str[i]=s.next();
}
do
{
System.out.println("\n***ARRAY ELEMENT SEARCH***");
System.out.println("\n 1.Linearsearch\n 2.Binarysearch\n 3.Exit");
System.out.println("\nenter your choice : " );
ch=s.nextInt();
switch(ch)
{
case 1:
        System.out.print("enter the element to be searched : ");
   search=s.next();
        for(i=0; i<n; i++)
        {
        if(str[i].equals(search))
        {
        flag=1;
        break;
        }
        else
        {
        flag=0;
        }
        }
        if(flag==1)
        {
        System.out.println("element " +search+ " found at position "+(i)+" !!! ");
```

```
        }
        else
        {
        System.out.println("element not found!!!");
        }
        break;
case 2:
        System.out.print("enter the element to be searched : ");
   search=s.next();
        Arrays.sort(str);
        int searchIndex = binarySearch(str,search);
   System.out.println(searchIndex != -1 ? str[searchIndex]+ " found at index "+searchIndex : "element not found !!!");
   break;
case 3:
        break;
default:
        System.out.println("invalid option !!!");
        break;
}
}
while(ch!=3);
}
public static int binarySearch(String a[], String x)
{
int low=0;
int high=a.length-1;
int mid;
while (low<=high) {
```

```
mid=(low + high)/2;
if (a[mid].compareTo(x)<0)
{
low = mid + 1;
}
else if (a[mid].compareTo(x)>0) {
high=mid-1;
}
else {
return mid;
}
}
return -1;
}
}
```

OUTPUT

```
enter the limit : 4
enter all the elements :
amal
ts
vishnu
zxy

***ARRAY ELEMENT SEARCH***

 1.Linearsearch
 2.Binarysearch
 3.Exit

enter your choice :
1
enter the element to be searched : ts
element ts found at position 1 !!!

***ARRAY ELEMENT SEARCH***

 1.Linearsearch
 2.Binarysearch
 3.Exit

enter your choice :
2
enter the element to be searched : amal
amal found at index 0

***ARRAY ELEMENT SEARCH***

 1.Linearsearch
 2.Binarysearch
 3.Exit

enter your choice :
3

E:\MCA\Sem 2 Lab\JAVA\Sem2_Java\lab cycle 2\02.Search_Element>
```

EXPERIMENT 3 :STRING MANIPULATIONS

AIM: Perform string manipulations

- **Create new strings using new.**
- **Getting String length**
- **String Concatenation**
- **Character extraction**
- **String Comparison**
- **Searching substrings**
- **Modifying a string**
- **Data conversion using valueOf()**

ALGORITHM

1.Define class StringManipulation with the main function.

2.Inside the main function define the variables str,str1,str2,str3,r,t.

3. Create a menu with options create new string,getting a string length, string concatenation, character extraction string comparison, searching substrings, modifying a string, data conversion using valueOf().

4.Enter the string

5.Find String lenth using str.length()

6.Enter 2 strings and concatenate using concat().

7.Enter a string and extract character using charAt().

8.Enter 2 strings and compare using compareTo().

9.Search substring using str.substring()

10.Replace character using replace()

11.data conversion using valueOf().

PROGRAM

```
import java.util.*;
class String_Manipulation{
public static void main(String args[])
{
String str,str1,str2,str3,r,t;
char c;
int p,q,ch,n;
Scanner s = new Scanner(System.in);
System.out.println("***STRING MANIPULATION***");
System.out.println("\n1.create new string\n2.getting a string length\n3.string concatenation\n4.character extraction\n5.string comparision\n6.searching substrings\n7.modifying a string\n8.data conversion using valueOf()");
do
{
System.out.println("enter your choice :");
ch=s.nextInt();
switch(ch)
{
case 1:
System.out.println("enter any string : ");
str=s.next();
String s1 = new String(str);
System.out.println("new string : "+s1);
break;
case 2:
System.out.println("enter any string : ");
str=s.next();
System.out.println("length of string : " + str.length());
```

```
break;
case 3:
System.out.println("enter 1st string : ");
str1=s.next();
System.out.println("enter 2nd string : ");
str2=s.next();
str3=str1.concat(str2);
System.out.println("concatenated String : "+str3);
break;
case 4:
System.out.println("enter any string : ");
str=s.next();
System.out.println("enter the position :");
p=s.nextInt();
c=str.charAt(p);
System.out.println("character extraction : "+c);
break;
case 5:
System.out.println("enter 1st string : ");
str1=s.next();
System.out.println("enter 2nd string : ");
str2=s.next();
System.out.println("string comparsion : "+str1.compareTo(str2));
break;
case 6:
System.out.println("enter any string : ");
str=s.next();
System.out.println("enter the position of substring :");
q=s.nextInt();
```

```
System.out.println("searching substrings : "+str.substring(q));
break;
case 7:
System.out.println("enter any string : ");
str1=s.next();
System.out.println("enter the character to be replaced :");
r=s.next();
System.out.println("enter the character to be replaced with :");
t=s.next();
str2=str1.replace(r,t);
System.out.println("replacing strings : "+str2);
break;
case 8:
System.out.println("enter any number : ");
n=s.nextInt();
str=String.valueOf(n);
System.out.println("data conversion using valueOf() : "+str);
break;
case 9:
System.out.println("exiting!!");
break;
default:
System.out.println("invalid choice !!!");
break;
}
}
while(ch!=9);
}
}
```

OUTPUT

```
***STRING MANIPULATION***

1.create new string
2.getting a string length
3.string concatenation
4.character extraction
5.string comparision
6.searching substrings
7.modifying a string
8.data conversion using valueOf()
enter your choice :
1
enter any string :
amal
new string : amal
enter your choice :
2
enter any string :
amal
length of string : 4
enter your choice :
3
enter 1st string :
amalts
enter 2nd string :
20mca011
concatenated String : amalts20mca011
enter your choice :
4
enter any string :
amal
enter the position :
3
character extraction : l
enter your choice :
5
enter 1st string :
java
enter 2nd string :
oops
string comparsion : -5
enter your choice :
6
enter any string :
object
enter the position of substring :
2
searching substrings : ject
```

```
enter your choice :
7
enter any string :
javarrogramming
enter the character to be replaced :
r
enter the character to be replaced with :
p
replacing strings : javappogpamming
enter your choice :
8
enter any number :
0005
data conversion using valueOf() : 5
enter your choice :
9
exiting!!
```

EXPERIMENT 4 :ARRAY OF OBJECT

AIM: Program to create a class for Employee having attributes eNo, eName eSalary. Read n employ information and Search for an employee given eNo, using the concept of Array of Objects.

ALGORITHM

1. Define class Employee with variables eNo,eName,eSalary.
2. Define a function getdata() to get data from user like employee number, employee name and employee salary.
3. Define function display() to display the details of employee
4. Define the main function and inside that enter the details and display the details of n employees
5. Enter the id to search for employee and display details

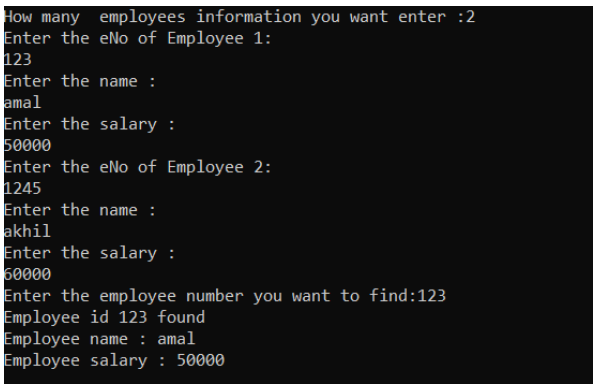
PROGRAM

```
import java.util.Scanner;

public class Employee
```

```
{
  public static void main(String[] args)
  {
  int count,flag = 0, i;
  Scanner scan = new Scanner(System.in);
  System.out.print("How many  employees information you want enter :");
  count = scan.nextInt();
  String eName[] = new String[count];
  int eSalary[] = new int[count];
  int  eNo[] = new int[count];
  Scanner scan2 = new Scanner(System.in);
  Scanner scan3 = new Scanner(System.in);
  Scanner scan4 = new Scanner(System.in);
   for( i = 0; i < count; i++)
  {
     System.out.println("Enter the eNo of Employee "+(i+1)+ ":");
     eNo[i] = scan2.nextInt();
     System.out.println("Enter the name :");
     eName[i] = scan3.nextLine();
     System.out.println("Enter the salary :");
     eSalary[i] = scan4.nextInt();
  }
  Scanner s = new Scanner(System.in);
  System.out.print("Enter the employee number you want to find:");
  int x = s.nextInt();
  for( i = 0; i < count; i++)
  {
    if(eNo[i] == x)
    {
```

```
            flag = 1;
            break;
        }
    }
    if(flag == 1)
    {
      int t = i;
      System.out.println("Employee id "+x+" found");
      System.out.println("Employee name : "+eName[t]);
      System.out.println("Employee salary : "+eSalary[t]);
    }
    else
    {
       System.out.println("Employee id not found");
    }
    scan.close();
    scan2.close();
    scan3.close();
    scan4.close();
    s.close();
    }
}
```

OUTPUT



EXPERIMENT 5 :DESIGN A CLASS REPRESENT STUDENT DETAILS

AIM: Design a class to represent a Student details. include the Student ID, name of the Student, branch, year and assign initial values, calculate average of marks of 6 subjects, and display grade. Also print the details of the students in the first and second position.

Program prints the grade based on this logic.

a. If the average of marks is >= 80 then prints Grade 'A'

b. If the average is <80 and >=60 then prints Grade 'B'

c. If the average is <60 and >=40 then prints Grade 'C'

d. else prints Grade 'D'

ALGORITHM

1.Define class Student with variables tot, I, avg, sid, name, branch, and array marks[].

2.Define a function getdata() to get data from user like student id, student name, student branch, student year and marks of subjects.

3.Define function display() to display the details of student

4.Find average marks and grade of student

5.Display first and second position of students

PROGRAM

```
import java.util.*;


class Student_Details
{
int tot,i,avg,yr,sid;
String sname,branch;
```

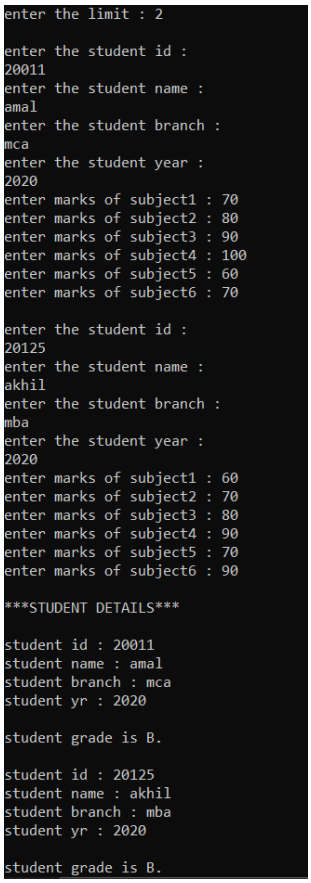
```
int marks[]= new int[6];
Scanner s = new Scanner(System.in);
public void getdata()
{
System.out.println("\nenter the student id : ");
sid=s.nextInt();
System.out.println("enter the student name : ");
sname=s.next();
System.out.println("enter the student branch : ");
branch=s.next();
System.out.println("enter the student year : ");
yr=s.nextInt();

for(i=0; i<6; i++)
{
System.out.print("enter marks of subject"+(i+1)+" : ");
marks[i]=s.nextInt();
tot=tot+marks[i];
}
avg=tot/6;
}
public void display()
{
System.out.println("\nstudent id : " +sid);
System.out.println("student name : " +sname);
System.out.println("student branch : " +branch);
System.out.println("student yr : " +yr);
if(avg>=80)
{
```

```
System.out.print("\nstudent grade is A.\n");
}
else if(avg>=60 && avg<80)
{
System.out.print("\nstudent grade is B.\n");
}
else if(avg>=40 && avg<60)
{
System.out.print("\nstudent grade is C.\n");
}
else
{
System.out.print("\nstudent grade is D.\n");
}
}
public static void main(String args[])
{
int n=0,maxi1=0,maxi2=0;
float max1=0,max2=0;
Scanner s1 = new Scanner(System.in);
System.out.print("enter the limit : ");
n=s1.nextInt();
Student s[]=new Student[n];
for(int i=0; i<n; i++)
{
s[i]=new Student();
s[i].getdata();
}
System.out.println("\n***STUDENT DETAILS***");
```

```
for(int i=0; i<n; i++)
{
s[i].display();
}
for(int i=1;i<n;i++)
{
if(s[i].avg<s[i-1].avg)
{
max1=s[i].avg;
maxi1=i;
}
else
{
max1=s[i-1].avg;
maxi1=i-1;
}
max2=max1;
maxi2=maxi1;
}
for(int i=0; i<n; i++)
{
if(max1<=s[i].avg)
{
max1=s[i].avg;
maxi1=i;
}
}
for(int i=0; i<n; i++)
{
```

```
if(max2<=s[i].avg && max1!=s[i].avg)
{
max2=s[i].avg;
maxi2=i;
}
}
System.out.println("\n***FIRST POSITION***");
s[maxi1].display();
System.out.println("average marks : "+max1);
System.out.println("\n***SECOND POSITION***");
s[maxi2].display();
System.out.println("average marks : "+max2);
}
}
```

OUTPUT



```
enter the limit : 2

enter the student id :
20011
enter the student name :
amal
enter the student branch :
mca
enter the student year :
2020
enter marks of subject1 : 70
enter marks of subject2 : 80
enter marks of subject3 : 90
enter marks of subject4 : 100
enter marks of subject5 : 60
enter marks of subject6 : 70

enter the student id :
20125
enter the student name :
akhil
enter the student branch :
mba
enter the student year :
2020
enter marks of subject1 : 60
enter marks of subject2 : 70
enter marks of subject3 : 80
enter marks of subject4 : 90
enter marks of subject5 : 70
enter marks of subject6 : 90

***STUDENT DETAILS***

student id : 20011
student name : amal
student branch : mca
student yr : 2020

student grade is B.

student id : 20125
student name : akhil
student branch : mba
student yr : 2020

student grade is B.
```

```
***FIRST POSITION***

student id : 20011
student name : amal
student branch : mca
student yr : 2020

student grade is B.
average marks : 78.0

***SECOND POSITION***

student id : 20125
student name : akhil
student branch : mba
student yr : 2020

student grade is B.
average marks : 76.0
```

EXPERIMENT 6 :DESIGN CLASS TO REPRESENT A BANK ACCOUNT

AIM: Design a class to represent a bank account which include account number, name of the depositor, type of the account and balance amount in the account. Define Methods, to assign initial values, to Deposit an amount, to Withdraw amount after checking balance, to display name and balance.

ALGORITHM

1.Define class BankAccount with variables accno, dname, acctype, amount, balance.

2.Define a function getdata() to get data from user like Account number, name of depositor, account type and balance amount.

3.Define function deposit() to add the amount deposited to the final balance

4.Define function withdraw() to subtract the amount from final balance.

5.Define function display() to display the account details.

6.Inside the main function enter limit n and details of n accounts.

PROGRAM

```
import java.util.*;
```

```
class BankAccount
{
int accno;
String dname, acctype;
double amount,balance;
Scanner s = new Scanner(System.in);
public void getdata()
{
System.out.println("\nenter the account number : ");
accno=s.nextInt();
System.out.println("enter the name of the depositor : ");
dname=s.next();
System.out.println("enter the type of the account : ");
acctype=s.next();
System.out.println("enter the balance amount : ");
balance=s.nextDouble();
}
public void deposit()
{
System.out.println("\naccount balance : "+balance);
System.out.println("\nenter the amount to be deposited : ");
amount=s.nextDouble();
if (amount>0)
{
balance+=amount;
}
else
{
System.out.println("error: invalid amount!!!");
```

```
}
}
public void withdrawn()
{
System.out.println("\naccount balance : "+balance);
System.out.println("\nenter the amount to be withdrawn : ");
amount=s.nextDouble();
if (amount>0 && amount<balance)
{
balance-=amount;
}
else
{
System.out.println("error: insufficient balance/invalid amount!!!");
}
}
public void display()
{
System.out.println("\nname of the depositor : "+dname);
System.out.println("account type : "+acctype);
System.out.println("account balance : "+ balance);
}
public static void main(String args[])
{
int n=0;
Scanner s1 = new Scanner(System.in);
System.out.print("enter the limit : ");
n=s1.nextInt();
BankAccount b[]=new BankAccount[n];
```

```
for(int i=0; i<n; i++)
{
b[i]=new BankAccount();
b[i].getdata();
}
System.out.println("\n***ACCOUNT DETAILS***");
for(int i=0; i<n; i++)
{
b[i].deposit();
b[i].withdrawn();
b[i].display();
}
}
}
```

OUTPUT

```
enter the limit : 1

enter the account number :
145782225
enter the name of the depositor :
amal
enter the type of the account :
savings
enter the balance amount :
5000

***ACCOUNT DETAILS***

account balance : 5000.0

enter the amount to be deposited :
500

account balance : 5500.0

enter the amount to be withdrawn :
200

name of the depositor : amal
account type : savings
account balance : 5300.0
```