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CSE1007 – Lab Exercise on Collections Framework

Question 1

Write a Java Program to store the 5 words using ArrayList and display the wordswhich are palindrome from the 5 words.

CODE:

```
import java.util.*;

public class q1{

   public static boolean isPalindrome(String s)
   {
      String rev="";
      for(int i=s.length()-1;i>=0;i--)
      rev+=s.charAt(i);
      if(s.equals(rev))
      return true;
      else
      return false;
   }

   public static void main(String[] args)
   {
      Scanner in = new Scanner(System.in);
      int i;
      String s;
      ArrayList <String> words = new ArrayList<String> ();
      System.out.print("Enter n: ");
      int n=in.nextInt();
      System.out.println("\nEnter "+n+" words: ");
      for(i=0;i<n;i++)
      {
         s=in.next();
         words.add(s);
      }
      Iterator itr= words.iterator();
      System.out.println("\nPalindrome Words: ");
      while(itr.hasNext())
      {
         s=(String) itr.next();
         if(isPalindrome(s))
         System.out.println(s);
      }
   }
}
```

OUTPUT:

```
C:\Gokul\VIT\SEM-4\CSE1007 - Java\Lab\Lab12>javac q1.java

C:\Gokul\VIT\SEM-4\CSE1007 - Java\Lab\Lab12>java q1
Enter n: 5

Enter 5 words:
captain
radar
treatment
malayalam
rotor

Palindrome Words:
radar
malayalam
rotor
```

Question 2

Develop a Java program to create an ArrayList of Floating point data type with 5user input elements and find the mean, mode and standard deviation of all the elements from the ArrayList and store the mean, mode and standard deviation in 5th,6th, and 7th positions respectively.

CODE:

```
import java.util.*;

public class q2 {

  public static float mode(float[]Ar, int n)
  {
    int i,j,count,max=0;
    float f=0;
    for(i=0;i<n-1;i++)
    {
      count=0;
      for(j=i+1;j<n;j++)
      {
        if(Ar[i]==Ar[j])
        count++;
      }
      if(count>max)
      {
        max=count;
        f=Ar[i];
      }
    }
    return f;
  }

  public static double sd(float mean, float[]Ar, int n)
```

```
    {
        float sDev=0;
        for(int i=0;i<n;i++)
        sDev += Math.pow(Ar[i] - mean, 2);

        return Math.sqrt(sDev/n);
    }

    public static void main(String[] args)
    {
        Scanner in = new Scanner(System.in);
        int i,n=5;
        float f,total=0;
        float[] Ar = new float[n];
        ArrayList <Float> list = new ArrayList <Float> ();
        System.out.println("Enter "+n+" Floating point values: ");
        for(i=0;i<n;i++)
        {
            f=in.nextFloat();
            list.add(f);
        }
        Iterator itr = list.iterator();
        i=0;
        while(itr.hasNext())
        {
            f=(float)itr.next();
            total+=f;
            Ar[i++]=f;
        }
        float mean=total/n;
        System.out.println("\nMean = "+mean);
        System.out.println("Mode = "+mode(Ar,n));
        System.out.println("SD   = "+sd(mean,Ar,n));
    }
}
```

OUTPUT:

```
C:\Gokul\VIT\SEM-4\CSE1007 - Java\Lab\Lab12>javac q2.java

C:\Gokul\VIT\SEM-4\CSE1007 - Java\Lab\Lab12>java q2
Enter 5 Floating point values:
2.5
3.6
7.5
3.6
1.5

Mean = 3.7400002
Mode = 3.6
SD   = 2.0362710956115344
```

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Question 3

Create a class bank with account number, name, bank_branch_name, and balance. Store the details of 10 customers either using parameterized constructor or through user input in a Java Collection LinkedList. Provide the facility to do the following

(i) Display the details of the customers who have balance greater than 50000Rs

(ii) Display the sum of all the account holders in a particular branch.

CODE:

```
import java.util.*;

class bank
{
   int ANo;
   String name, bname;
   double balance;

   Scanner in = new Scanner(System.in);

   bank()
   {
      System.out.print("Enter Account No: ");
      ANo=in.nextInt();
      System.out.print("Enter Name: ");
      name=in.next();
      System.out.print("Enter branch name: ");
      bname=in.next();
      System.out.print("Enter Balance: ");
      balance=in.nextDouble();
   }
}

public class q3
{
   public static void main(String[] args)
   {
      Scanner in = new Scanner(System.in);
      int i,n=10,ch;
      String branch;
      double dep=0;
      LinkedList <bank> list = new LinkedList <bank> ();

      for(i=0;i<n;i++)
      {
         System.out.println("\nEnter Details of Customer "+(i+1)+": ");
         bank b = new bank();
         list.add(b);
      }
```

```
      Iterator itr = list.iterator();
      System.out.println("\nAcc No\tName\tBranch\tBalance");
      while(itr.hasNext())
      {
         bank b=(bank)itr.next();
         System.out.println(b.ANo+"\t"+b.name+"\t"+b.bname+"\t"+b.balance);
      }

      while(true)
      {
         System.out.println("\n1. Display the details of the customers who have balance greater
than Rs.50000");
         System.out.println("2. Display the sum of all the account holders in a particular
branch\n3. Exit");
         System.out.print("Enter your choice: ");
         ch=in.nextInt();
         if(ch==1)
         {
            itr = list.iterator();
            System.out.println("\nAcc No\tName\tBranch\tBalance");
            while(itr.hasNext())
            {
               bank b=(bank)itr.next();
               if(b.balance>50000)
               System.out.println(b.ANo+"\t"+b.name+"\t"+b.bname+"\t"+b.balance);
            }
         }

         else if(ch==2)
         {
            itr = list.iterator();
            System.out.print("Enter branch name: ");
            branch=in.next();

            System.out.println("\nAcc No\tName\tBranch\tBalance");
            while(itr.hasNext())
            {
               bank b=(bank)itr.next();
               if(b.bname.equals(branch))
               {
                  System.out.println(b.ANo+"\t"+b.name+"\t"+b.bname+"\t"+b.balance);
                  dep+=b.balance;
               }
            }
            System.out.println("\nTotal Deposit in "+branch+" branch: "+dep);
         }
      }
   }
}
```

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OUTPUT:

```
C:\Gokul\VIT\SEM-4\CSE1007 - Java\Lab\Lab12>javac q3.java

C:\Gokul\VIT\SEM-4\CSE1007 - Java\Lab\Lab12>java q3

Enter Details of Customer 1:
Enter Account No: 101
Enter Name: Gill
Enter branch name: B2
Enter Balance: 56000

Enter Details of Customer 2:
Enter Account No: 102
Enter Name: Joseph
Enter branch name: B3
Enter Balance: 45000

Enter Details of Customer 3:
Enter Account No: 103
Enter Name: James
Enter branch name: B2
Enter Balance: 110000

Enter Details of Customer 4:
Enter Account No: 104
Enter Name: Raj
Enter branch name: B5
Enter Balance: 60000

Enter Details of Customer 5:
Enter Account No: 105
Enter Name: Roy
Enter branch name: B1
Enter Balance: 10000

Enter Details of Customer 6:
Enter Account No: 106
Enter Name: Steve
Enter branch name: B2
Enter Balance: 80000

Enter Details of Customer 7:
Enter Account No: 107
Enter Name: Joy
Enter branch name: B5
Enter Balance: 15000

Enter Details of Customer 8:
Enter Account No: 108
Enter Name: Rose
Enter branch name: B1
Enter Balance: 200000

Enter Details of Customer 9:
Enter Account No: 109
Enter Name: Mary
Enter branch name: B5
Enter Balance: 80000

Enter Details of Customer 10:
Enter Account No: 110
Enter Name: Jacob
Enter branch name: B2
Enter Balance: 39900

Acc No  Name    Branch  Balance
101     Gill    B2      56000.0
102     Joseph  B3      45000.0
103     James   B2      110000.0
104     Raj     B5      60000.0
105     Roy     B1      10000.0
106     Steve   B2      80000.0
107     Joy     B5      15000.0
108     Rose    B1      200000.0
109     Mary    B5      80000.0
110     Jacob   B2      39900.0
```

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```
1. Display the details of the customers who have balance greater than Rs.50000
2. Display the sum of all the account holders in a particular branch
3. Exit
Enter your choice: 1

Acc No  Name    Branch  Balance
101     Gill    B2      56000.0
103     James   B2      110000.0
104     Raj     B5      60000.0
106     Steve   B2      80000.0
108     Rose    B1      200000.0
109     Mary    B5      80000.0

1. Display the details of the customers who have balance greater than Rs.50000
2. Display the sum of all the account holders in a particular branch
3. Exit
Enter your choice: 2
Enter branch name: B2

Acc No  Name    Branch  Balance
101     Gill    B2      56000.0
103     James   B2      110000.0
106     Steve   B2      80000.0
110     Jacob   B2      39900.0

Total Deposit in B2 branch: 285900.0
```

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Question 4

Write a method that takes a string and returns the number of unique characters in the string. It is expected that a string with the same character sequence may be passed several times to the method. Use collections and maps where appropriate.

Include a main method to test harness the above method.

CODE:

```
import java.util.*;

public class q4{

   public static int count(String str)
   {
      char [] c=new char[str.length()];
      c=str.toCharArray();
      HashSet<Character> hs=new HashSet<Character>();

      for(char x:c)
      hs.add(x);

      System.out.println("\nUnique Characters: "+hs);
      return hs.size();
   }
   public static void main(String[] args)
   {
      Scanner in = new Scanner(System.in);
      int i;
      System.out.print("Enter a string: ");
      String s=in.next();
      System.out.println("No:of unique characters: "+count(s));
   }
}
```

OUTPUT:

```
C:\Gokul\VIT\SEM-4\CSE1007 - Java\Lab\Lab12>javac q4.java

C:\Gokul\VIT\SEM-4\CSE1007 - Java\Lab\Lab12>java q4
Enter a string: capricoin

Unique Characters: [p, a, r, c, i, n, o]
No:of unique characters: 7
```