Program (Array & String)

Q1. Write a program using a method Palin(), to check whether a string is a Palindrome or not. A Palindrome is a string that reads the same from the left to right and vice versa. Sample Input: MADAM, BOB, ABBA, POP etc.

Solution:

```
import java.util.Scanner;
class StringPalindrome
{
public void palin() {

Scanner in = new Scanner(System.in);
System.out.print("Enter the string: ");
String s = in.nextLine();

String str = s.toUpperCase();
int strLen = str.length();
boolean isPalin = true;

for (int i = 0; i < strLen / 2; i++) {
if (str.charAt(i) != str.charAt(strLen - 1 - i)) {
isPalin = false;
break;
}
}

if (isPalin)
System.out.println("It is a palindrome string.");
else
System.out.println("It is not a palindrome string.");
}
}
```

```
class StringPalindromeDemo
{
public static void main(String args[])
{

StringPalindrome sp=new StringPalindrome();
sp.palin();
}
}
```

Q2. Write a program in Java to accept a String from the user. Pass the String to a function Display(String str) which displays the consonants present in the String.

```
import java.util.Scanner;
class Consonants
{
 public void display(String str) {

 String t = str.toUpperCase();
 int len = t.length();

 for (int i = 0; i < len; i++) {
 char ch = t.charAt(i);
 if (ch != 'A' &&
 ch != 'E' &&
 ch != 'I' &&
 ch != 'O' &&
 ch != 'U') {
 System.out.println(str.charAt(i));
 }
 }
 }

 public static void main(String args[]) {
 Scanner in = new Scanner(System.in);
 System.out.print("Enter string: ");
 String s = in.nextLine();

 Consonants obj = new Consonants();
 obj.display(s);
 }
```

Q3. Write a program in Java to accept a String from the user. Pass the String to a function Change(String str) which displays the first character of each word after changing the case (lower to upper and vice versa).
Sample Input: NORTH EASTERN REGIONAL INSTITUTE OF SCIENCE AND TECHNOLOGY
Sample Output: NERIST

```
import java.util.Scanner;
class StringChange
{
 public void change(String str) {
 String t = " " + str;
 int len = t.length();
 for (int i = 0; i < len - 1; i++) {
 if (t.charAt(i) == ' ') {
 char ch = t.charAt(i+1);
 if (Character.isUpperCase(ch))
 ch = Character.toLowerCase(ch);
 else if (Character.isLowerCase(ch))
 ch = Character.toUpperCase(ch);
 System.out.print(ch);
 }
 }
 }
 public static void main(String args[]) {
 Scanner in = new Scanner(System.in);
 System.out.print("Enter a string: ");
 String s = in.nextLine();
 StringChange obj = new StringChange();
 obj.change(s);
}}
```

Q4.

Write a program in Java to accept the name of an employee and his/her annual income. Pass the name and the annual income to a function Tax(String name, int income) which displays the name of the employee and the income tax as per the given tariff:

Annual Income	**Income Tax**
Up to ₹2,50,000	No tax
₹2,50,001 to ₹5,00,000	10% of the income exceeding ₹2,50,000
₹5,00,001 to ₹10,00,000	₹30,000 + 20% of the amount exceeding ₹5,00,000
₹10,00,001 and above	₹50,000 + 30% of the amount exceeding ₹10,00,000

```
import java.util.Scanner;
class EmployeeTax
{
 public void tax(String name, int income) {
  double tax;
 if (income <= 250000)
 tax = 0;
 else if (income <= 500000)
 tax = (income - 250000) * 0.1;
 else if (income <= 1000000)
 tax = 30000 + ((income - 500000) * 0.2);
 else
 tax = 50000 + ((income - 1000000) * 0.3);
  System.out.println("Name: " + name);
 System.out.println("Income Tax: " + tax);
 }
  public static void main(String args[]) {
 Scanner in = new Scanner(System.in);
 System.out.print("Enter name: ");
 String n = in.nextLine();
 System.out.print("Enter annual income: ");
 int i = in.nextInt();
EmployeeTax obj = new EmployeeTax();
 obj.tax(n, i);
 }
}
```

Q5. Write a program in Java to accept a String from the user. Pass the String to a function First(String str) which displays the first character of each word.
Sample Input : Computer Science Engineerinhg
Sample Output: CSE

```
import java.util.Scanner;
class FirstCharacter
{
 public void first(String str) {
 String t = " " + str;
 int len = t.length();

 for (int i = 0; i < len - 1; i++) {
 if (t.charAt(i) == ' ') {
 char ch = t.charAt(i + 1);
 System.out.print(ch);
 }
 }
 }

 public static void main(String args[]) {
 Scanner in = new Scanner(System.in);
 System.out.print("Enter a string: ");
 String s = in.nextLine();

 FirstCharacter obj = new FirstCharacter();
 obj.first(s);
 }
}
```

Q6. Write a program in Java to enter a sentence. Display the words which are only palindrome.
Sample Input: MOM AND DAD
Sample Output: MOM
DAD

```
import java.util.Scanner;
class PalinWords
{
 public static void main(String args[]) {
 Scanner in = new Scanner(System.in);
 System.out.println("Enter a sentence:");
 String str = in.nextLine();
 str = str + " ";
 String word = "";
 int len = str.length();

 for (int i = 0; i < len; i++) {
 char ch = str.charAt(i);
 if (ch == ' ')
{
 int wordLen = word.length();
 boolean isPalin = true;
 for (int j = 0; j < wordLen / 2; j++) {
 if (word.charAt(j) != word.charAt(wordLen - 1 - j)) {
 isPalin = false;
 break;
 }
 }

 if (isPalin)
 System.out.println(word);

 word = "";
 }
 else {
 word += ch;
 }
 }
 }
}
```

Q7. Write a program to display the pattern:

```
A B C D E
B C D E
C D E
D E
 E
```

```
class StringPattern {
 public static void main(String args[]) {
 String word = "ABCDE";
 int len = word.length();

 for (int i = 0; i < len; i++) {
 for (int j = i; j < len; j++) {
 char ch = word.charAt(j);
 System.out.print(ch);

}
 System.out.println();

}

}
}
```

Q9. Write a program in Java to store 10 words in a Single Dimensional Array. Display only those words which are Palindrome.

Sample Input: MADAM, TEACHER, SCHOOL, MOM, ……

Sample Output: MADAM

MOM

```
import java.util.Scanner;
class SDAPalindrome
{
 public static void main(String args[]) {
 Scanner in = new Scanner(System.in);
```

```
String words[] = new String[10];
System.out.println("Enter 10 words:");
for (int i = 0; i < words.length; i++) {
words[i] = in.nextLine();
}

System.out.println("\nPalindrome Words:");
for (int i = 0; i < words.length; i++) {
String str = words[i].toUpperCase();
int strLen = str.length();
boolean isPalin = true;
for (int j = 0; j < strLen / 2; j++) {
if (str.charAt(j) != str.charAt(strLen - 1 - j)) {
isPalin = false;
break;
}
}
if (isPalin)
System.out.println(words[i]);

}
}
}
```

Q10. A string is said to be 'Unique' if none of the letters present in the string are repeated. Write a program to accept a string and check whether the string is Unique or not. The program displays a message accordingly.

Sample Input: COMPUTER
Sample Output: Unique String

```
import java.util.Scanner;
class UniqueString  {
 public static void main(String args[]) {
 Scanner in = new Scanner(System.in);
 System.out.print("Enter a string: ");
 String str = in.nextLine();
 str = str.toUpperCase();
 boolean isUnique = true;
 int len = str.length();

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

 char ch = str.charAt(i);
for (int j = i + 1; j < len; j++) {
 if (ch == str.charAt(j))
 {
 isUnique = false;
 break;
 }
 }
 if (!isUnique)
 break;
 }
  if (isUnique)
 System.out.println("Unique String");
 else
 System.out.println("Not Unique String");
 }
}
```

Q11. **Write a program in Java to store 10 numbers (including positive and negative numbers) in a Single Dimensional Array (SDA). Display all the negative numbers followed by the positive numbers without changing the order of the numbers.**

Sample Input:

n[0]	n[1]	n[2]	n[3]	n[4]	n[5]	n[6]	n[7]	n[8]	n[9]
15	21	-32	-41	54	61	71	-19	-44	52

Sample Output: -32, -41, -19, 44, 15, 21, 54, 61, 71, 52

```
import java.util.Scanner;

class SDANumbers
{
   public static void main(String args[]) {
      Scanner in = new Scanner(System.in);
      int arr[] = new int[10];     // array declaration
          System.out.println("Enter 10 numbers");
      for (int i = 0; i < arr.length; i++) {
         arr[i] = in.nextInt();
      }
            for (int i = 0; i < arr.length; i++)
       {
         if (arr[i] < 0)
            System.out.print(arr[i] + ", ");
      }
            for (int i = 0; i < arr.length; i++) {
         if (arr[i] >= 0)
            System.out.print(arr[i] + ", ");
      }     }}
```

Q 12 Write a program in Java to store 20 numbers in a Single Dimensional Array (SDA). Display the numbers which are prime.

Sample Input:

int n[]=new n[20];

n[0]	n[1]	n[2]	----------	n[18]	n[19]
45	65	79	----------	19	31

Sample Output: 79, 19, 31

```
import java.util.Scanner;
```

```
class SDAPrimeNumbers
{     public static void main(String args[]) {
       Scanner in = new Scanner(System.in);
       int arr[] = new int[20];
       System.out.println("Enter 20 numbers");
       for (int i = 0; i < arr.length; i++) {
          arr[i] = in.nextInt();
       }
       System.out.println("Prime Numbers:");
       for (int i = 0; i < arr.length; i++)    // arr[]={2, 3, 4, 5, 7, 6, 12, .....90};
          {
          int c = 0;
          for (int j = 1; j <= arr[i]; j++)
             {
             if (arr[i] % j == 0)
                {
                c++;
                }
              }
          if (c == 2)
              System.out.print(arr[i] + ", ");
       }
    }
}
```

Q12. **Write a program to input a number. Use a function int Armstrong(int n) to accept the number. The function returns 1, if the number is Armstrong, otherwise zero(0).**

Sample Input: 153 ,
Sample Output: 153 ⇒ 1*1*1 + 5*5*5 + 3*3*3 = 1+125+27=153== Aramstrong no
Sample Input: 8 then 8=8*8*8=64*8=324==8=not a AS no
It is an Armstrong Number.

```
import java.util.Scanner;
class ArmstrongNumber
{
   public int armstrong(int n) {

      int num = n, cubeSum = 0;

      while (num > 0) {
         int digit = num % 10;
         cubeSum = cubeSum + (digit * digit * digit);   //imp
         num /= 10;
      }

      if (cubeSum == n)
         return 1;
      else
         return 0;
   }

   public static void main(String args[]) {

      Scanner in = new Scanner(System.in);
      System.out.print("Enter Number: ");
      int num = in.nextInt();

 ArmstrongNumber obj = new ArmstrongNumber();
      int r = obj.armstrong(num);

      if (r == 1)
         System.out.println(num + " is an Armstrong number");
      else
         System.out.println(num + " is not an Armstrong number");
   }
}
```

Q14. **Write a program to input a number and check and print whether it is a 'Pronic' number or not. Use a function int Pronic(int n) to accept a number. The function returns 1, if the number is 'Pronic', otherwise returns zero (0).** (Hint: Pronic number is the number which is the product of two consecutive integers)

Examples:
12 = 3 * 4
20 = 4 * 5
42 = 6 * 7

```
import java.util.Scanner;
class PronicNumber
{
   public int pronic(int n) {

      int isPronic = 0;

      for (int i = 1; i <= n - 1; i++) {
         if (i * (i + 1) == n) {
            isPronic = 1;
            break;
         }
      }

      return isPronic;
   }
   public static void main(String args[]) {
      Scanner in = new Scanner(System.in);
      System.out.print("Enter the number to check: ");
      int num = in.nextInt();

      PronicNumber obj = new  PronicNumber();
      int r = obj.pronic(num);

      if (r == 1)
```

```
            System.out.println(num + " is a pronic number");
        else
            System.out.println(num + " is not a pronic number");

    }
}
```

Q.15. Write a program to enter a two digit number and find out its first factor excluding 1 (one). The program then find the second factor (when the number is divide by the first factor) and finally displays both the factors.

Hint: Use a non-return type function as void fact(int n) to accept the number.

Sample Input: 21
The first factor of 21 is 3
Sample Output: 3, 7
Sample Input: 30
The first factor of 30 is 2
Sample Output: 2, 15

```
import java.util.Scanner;

class Factors
{
    public void fact(int n) {

        if (n < 10 || n > 99) {
            System.out.println("ERROR!!! Not a 2-digit number");
            return;
        }

        int i;
        for (i = 2; i <= n; i++) {
            if (n % i == 0)
                break;
        }

        int sf = n / i;
```

```
        System.out.println(i + ", " + sf);
    }

    public static void main(String args[]) {

        Scanner in = new Scanner(System.in);

        System.out.print("Enter number: ");
        int num = in.nextInt();
        Factors obj = new Factors();
        obj.fact(num);
    }
}
```