R. J. International

ICSE Affiliated (School Code: MA 218)

COMPUTER PROJECTS LIST 2022 – 2023

GRADE : X **MARKS : 100**

SUB.: COMPUTER **DATE: 01/11/2022**

Maximum Marks: 100

There are 20 practicals that are to be performed in the computer lab in the presence of the teacher.

*This practical must be written on **A4 size plain single line project papers***

*Answers to all the practicals must be written only after **running the code successfully** & getting the required **output**.*

Following documentation sequence must be followed :

1. **Title Page**
2. **Certificate**
3. **Acknowledgment**
4. **Index Page (with Sr. No., Topic Name, Page Number & Sign)**
5. **Actual Practicals**
   a. Title
   b. Question
   c. Code
   d. Variable Description Table
6. **Conclusion**

This Project should be completed & submitted on the given submission date by the teacher.

ASSIGNMENT 1 : BASIC PROGRAMS

A. Write a program for calculating area of a circle whose radius is 10 cm & a rectangle with length 10 cm & breadth 5 cm. Display all the values. (use PI = 3.14)

Ans.

```
Public class area{
    public static void main(string args[]){
        int r, l, b;
        r = 10;
        l = 10;
        b = 5;
        float PI = 3.14, area_c, area_r;
        area_c = PI * r * r;
        area_r = l * b;
        System.out.println("Radius of Circle = " + r);
        System.out.println("Area of Circle = " + area_c);
        System.out.println("Length & Breadth of Rectangle = " + l + "/t" + b);
        System.out.println("Area of Rectangle = " + area_r);
    }
}
```

VARIABLE NAME	DATATYPE	PURPOSE
R	int	To store the value of Radius
l & b	int	To store the values of Length & Breadth
PI	float	To store the value of π
area_c & area_r	float	To store the areas of Circle & Rectangle

B. Write a program for calculating difference between the areas of two circles with radius 20 cm & 30 cm. Display both the radius, areas along with their difference as the final output. (use PI = 3.14)

Ans.

```
Public class area{
        public static void main(string args[]){
                int r1, r2;
                r1 = 20;
                r2 = 30;
                float PI = 3.14, area_c1, ares_c2, diff;
                area_c1 = PI * r1 * r1;
                area_c2 = PI * r2 * r2;
                diff = area_c1 - area_c2;
                System.out.println("Radius of Circles = " + r1+ "/t" + r2);
                System.out.println("Area of Circle 1 = " + area_c1);
                System.out.println("Area of Circle 2 = " + area_c2);
                System.out.println("Difference = " + diff);
        }
}
```

VARIABLE NAME	DATATYPE	PURPOSE
r1 & r2	int	To store the values of both the Radius
PI	float	To store the value of π
area_c1 & area_c2	float	To store the areas of both the Circles

C. Write a java program for calculating the perimeter of a circle with radius 15 cm and a rectangle with length 30 cm & breadth 10 cm. Display all the values. (use PI = 3.14)

Ans.

```
Public class area{
        public static void main(string args[]){
                int r, l, b;
                r = 15;
                l = 30;
                b = 10;
                float PI = 3.14, pc, pr;
                pc = 2 * PI * r;
                pr = 2 * (l + b);
                diff = area_c1 - area_c2;
                System.out.println("Radius of Circle = " + r);
                System.out.println("Perimeter of Circle = " + pc);
                System.out.println("Length & Breadth of Rectangle = " + l + "/t" + b);
                System.out.println("Perimeter of Rectangle = " + pr);
        }
}
```

VARIABLE NAME	DATATYPE	PURPOSE
r	int	To store the value of Radius
l & b	int	To store the values of Length & Breadth
PI	float	To store the value of π
pc & pr	float	To store the perimeters of Circle & Rectangle

ASSIGNMENT 2 : PROGRAMS ON EVEN & ODD NUMBERS – 1

A. Write a java program for displaying all the even numbers from 1 – 100 with a tab space, as shown below,

2 4 6 8 10……

Ans.

```
import java.util.*;
        public static void main(String[] args) {
                System.out.println("Even Numbers from 1 to 100 are :");
```

```
        for(int num=1 ; num <= 100 ; num++){
            if(num % 2 == 0){
            System.out.print(""+num+" ");
        }
    }
}
```

VARIABLE NAME	DATATYPE	PURPOSE
Num	int	For initializing the *for* loop

B. Write a java program for displaying all the odd numbers from 1 – 100 with a tab space, as shown below,

1 3 5 7 9……

Ans.

```
import java.util.*;
    public static void main(String[] args) {
        System.out.println("Even Numbers from 1 to 100 are :");
        for(int num=1 ; num <= 100 ; num++){
            if(num % 2 == 1){
                System.out.print(""+num+" ");
        }
    }
}
```

VARIABLE NAME	DATATYPE	PURPOSE
Num	int	For initializing the *for* loop

ASSIGNMENT 3 : PROGRAM ON MATH CLASS

Import the Math class. Create a user-defined class named as "Math_Functions"; take two variables x & y, having values 10 & 20.

Write the program to calculate –

a. maximum number
b. minimum number
c. square root of y
d. cube root of x
e. find the value of y^x & x^y
f. log(x) and log(y) **using Math Functions**; and display all the values in the main() function.

Ans.

```
import java.util.*;
public class Math_Functions{
int x=10, y=20;
 // return the maximum of two numbers
  System.out.println("Maximum number of x and y is: " +Math.max(x, y));

// return the maximum of two numbers
  System.out.println("Maximum number of x and y is: " +Math.min(x, y));
// return the square root of y
  System.out.println("Square root of y is: " + Math.sqrt(y));
```

```
  // return the cube root of x
  System.out.println("Square root of y is: " + Math.cbrt(x));

  //returns x^y
  System.out.println("Power of x raised to y is: " + Math.pow(x, y));

  //returns x^y
  System.out.println("Power of y raised to x is: " + Math.pow(y, x));

  // return the logarithm of x & y
  System.out.println("Logarithm of x is: " + Math.log(x));
  System.out.println("Logarithm of y is: " + Math.log(y));

}
```

VARIABLE NAME	DATATYPE	DESCRIPTION
X	int	To store the first value (10)
Y	int	To store the second value (20)

ASSIGNMENT 4 : WRAPPER CLASS

A. Write a simple java program to demonstrate the use of wrapper class, by declaring the class named 'WrapperClass', also define all the primitive datatype variables of your choice with the desired value and show the concept of autoboxing & unboxing.

Ans.

```
public class WrapperClass{
   public static void main(String args[]){
      //defining the values
      byte b=10;
      short s=20;
      int i=30;
      long l=40;
      float f=50.0F;
      double d=60.0D;
      char c='a';
      boolean b2=true;

      //Autoboxing: Converting primitive datatypes into objects
      Byte byteobj=b;
      Short shortobj=s;
      Integer intobj=i;
      Long longobj=l;
      Float floatobj=f;
      Double doubleobj=d;
      Character charobj=c;
      Boolean boolobj=b2;

      //Printing Autoboxed objects
      System.out.println("<---Printing object values (AUTOBOXING)--->");
```

```
        System.out.println("Byte object: "+byteobj);
        System.out.println("Short object: "+shortobj);
        System.out.println("Integer object: "+intobj);
        System.out.println("Long object: "+longobj);
        System.out.println("Float object: "+floatobj);
        System.out.println("Double object: "+doubleobj);
        System.out.println("Character object: "+charobj);
        System.out.println("Boolean object: "+boolobj);

        //Unboxing: Converting Objects to Primitive datatypes
        byte bytevalue=byteobj;
        short shortvalue=shortobj;
        int intvalue=intobj;
        long longvalue=longobj;
        float floatvalue=floatobj;
        double doublevalue=doubleobj;
        char charvalue=charobj;
        boolean boolvalue=boolobj;

        //Printing unboxed primitives
        System.out.println("\n<---Printing primitive values (UNBOXING)--->");
        System.out.println("byte value: "+bytevalue);
        System.out.println("short value: "+shortvalue);
        System.out.println("int value: "+intvalue);
        System.out.println("long value: "+longvalue);
        System.out.println("float value: "+floatvalue);
        System.out.println("double value: "+doublevalue);
        System.out.println("char value: "+charvalue);
        System.out.println("boolean value: "+boolvalue);
    }
}
```

VARIABLE NAME	DATATYPE	DESCRIPTION
b	byte *(Primitive)*	To store the byte value
s	short *(Primitive)*	To store the short value
i	int *(Primitive)*	To store the int value
l	Long *(Primitive)*	To store the long value
f	float *(Primitive)*	To store the float value
d	double *(Primitive)*	To store the double value
c	char *(Primitive)*	To store the char value
b2	boolean *(Primitive)*	To store the boolean value
byteobj	Byte *(Wrapper Class Object)*	To store the Byte *(Wrapper)* value
shortobj	Short *(Wrapper Class Object)*	To store the Short *(Wrapper)* value
intobj	Int *(Wrapper Class Object)*	To store the Int *(Wrapper)* value
longobj	Long *(Wrapper Class Object)*	To store the Long *(Wrapper)* value
floatobj	Float *(Wrapper Class Object)*	To store the Float *(Wrapper)* value
doubleobj	Double *(Wrapper Class Object)*	To store the Double *(Wrapper)* value
charobj	Char *(Wrapper Class Object)*	To store the Char *(Wrapper)* value

boolobj	Boolean *(Wrapper Class Object)*	To store the Boolean *(Wrapper)* value

ASSIGNMENT 5 : FUNCTIONS

A Write a program to perform the following functions to demonstrate the concept of function overloading.

Void check_num( ): It accepts two integers and a character as input and checks whether both numbers are even if the character is 'E', otherwise it checks whether the sum is prime or not.

Void check_num( ): It accepts two characters and an integer and finds the sum of the ASCII codes of the letters if the integers is even, otherwise it finds the word formed by combining both letters.

Void check_num( ): It accepts three integers and a character, if the character is 'A' then it finds the average of the integers, otherwise it finds the biggest of the three numbers using ternary operator.

Sol Already iven.

B .Create a class 'CompareNo' having two functions 'max()' & 'min()' with three parameters (a, b, c) for finding the maximum & minimum number from the three numbers. Write the main() function which creates an object of class to invoke both the methods.

Ans.

```
public class CompareNo
{
   public void max(int a, int b, int c){
      if(a>b && a>c){
         System.out.println("Maximum Number is : "+ a);
      }else if(b>a && b>c){
         System.out.println("Maximum Number is : "+ b);
      }if(c>a && c>b){
         System.out.println("Maximum Number is : "+ c);
      }
   }
   public void min(int a, int b, int c){
      if(a<b && a<c){
         System.out.println("Minimum Number is : "+ a)
         }else if(b<a && b<c){ System.out.println("Minimum Number is : "+ b);
      }if(c<a && c<b){
         System.out.println("Minimum Number is : "+ c);
      }
   }
   public static void main(){
      CompareNo obj = new CompareNo();
      obj.max(54, 41, 12);
      obj.min(54, 41, 12);
   }
}
```

VARIABLE NAME	DATATYPE	DESCRIPTION
a, b, c	int	To store the three numbers to be compared as parameters of the methods

ASSIGNMENT 6: class and object

Define a class 'ElectricBill' with the following specifications:
Instance variables / data members:
String n: To store the name of the customer.
Int units: To store the number of units consumed.
Double bill: To store the amount to be paid.
Member methods:
Void aceept( ): To accept the name of the customer and number of units consumed.
Void calculate( ): To calculate the bill as per the following tariff:

Number of units	**Rate per unit**
First 100 units	Rs. 2.00
Next 200 units	Rs. 3.00
Above 300 units	Rs. 5.00

Note: A surcharge of 2.5% charged if the number of units consumed is above 300 units.
Void print( ): To print the details as follows:
Name of the customer: _____
Number of units consumed: _____
Bill amount: _____
Write a main method to create an object of the class and call the above member methods.
Ans Already iven

ASSIGNMENT 7 : CONSTRUCTORS

Write a java program to create two constructors, one default & the other parameterized to demonstrate the concept of constructor overloading. The parameterized constructor will take id, name & age of the students as its parameters. Define a method display() which will display all the student details. Write the main method to create appropriate objects of the class. Write at least 5 student records & display them in tabular format.

Ans.

```
class Student{
   int id;
   String name;
   int age;
   //creating two arg constructor
   Student(){
      System.out.println("  ID\tNAME\tAGE");
   }
   //creating three arg constructor
   Student(int i, String n, int a){
      id = i;
      name = n;
      age = a;
   }
   void display(){
      System.out.println("  "+id+"\t"+name+"\t"+age);
   }

   public static void main(String args[]){
   Student s = new Student();
   Student s1 = new Student(101,"Karan",20);
   Student s2 = new Student(102,"Aryan",22);
   Student s3 = new Student(503,"Pritesh",18);
   Student s4 = new Student(301,"Sanket",19);
```

```
    Student s5 = new Student(202,"Ruchit",15);
    s1.display();
    s2.display();
    s3.display();
    s4.display();
    s5.display();
  }
}
```

VARIABLE NAME	DATATYPE	DESCRIPTION
I	Int	To store the student ID
N	String	To store student's Name
A	Int	To store student's Age
s, s1, s2, s3, s4, s5	Object	Objects of class Student to access methods

ASSIGNMENT 8 : CONSTRUCTORS

The basic salaries of the employees of 'ABC' organization is undergoing a revision. Write a program to define a class called 'Upgrade' with the following specifications. Use a default constructor to initialize the data members and invoke the methods in the main( ) method.
Data members:
String name: To store the name of the employee
Int bas: To consider the length of service as North America experience
Double inc: To store the increment
Double nbas: To store the new basic salary (basic + increment)
Member methods:
Upgrade( ): A constructor to initialize all data members
Void accept( ): To input name, basic, and experience
Void display( ): To print all the details of an employee
Void increment( ): To calculate the increment based on the experience as per the table given below:

Experience	Increment
Up to 3 years	Rs.1000 + 10% of basic
3 years or more and up to 5 years	Rs.3000 + 20% of basic
5 years or more and up to 10 years	Rs.5000 + 15% of basic
10 years or more	Rs.8000 + 20% of basic

Ans Already iven

ASSIGNMENT 9 : ARRAYS (SEARCHING TECHNIQUES)

A. Write a java program to create an array myList[] which stores integer values entered by the user. Make a provision for the user to enter the length of the array to be created. Display all the elements of the array and sum of all the array elements along with the length & the maximum element from the array.

Ans.

```
import java.util.Scanner;
public class Array {
  public static void main(String[] args) {
    Scanner sc = new Scanner(System.in);
    System.out.print("Enter the number of elements you want to store: ");
```

```
        int n=sc.nextInt();
        int[] myList = new int[n];
        for(int i=0; i<n; i++)
        {
        //reading array elements from the user
        System.out.print("Enter the element at "+ i +" : ");
        myList[i]=sc.nextInt();
        }
      // Print all the array elements
      for (int i = 0; i < myList.length; i++) {
         System.out.print(myList[i] + ", ");
      }

      // Summing all elements
      double total = 0;
      for (int i = 0; i < myList.length; i++) {
        total += myList[i];
      }
      System.out.println("\nTotal is " + total);

      // Finding the largest element
      int max = myList[0];
      for (int i = 1; i < myList.length; i++) {
        if (myList[i] > max) {
            max = myList[i];
        }
      }
      System.out.println("Length of Array is : " + myList.length);
      System.out.println("Max element is : " + max);
   }
}
```

VARIABLE NAME	DATATYPE	DESCRIPTION
myList[]	int (Array)	To store the array elements
Total	double	To store the sum of array elements
Max	int	To store the maximum array element
I	int	To initialize *for* loop
Sc	object	To create object of scanner class

B. Write a java program to implement Linear search for searching an element in an array.
Ans.

```
import java.util.*;
class LinearSearch {
   static int linearSearch(int a[], int n, int val) {
     for (int i = 0; i < n; i++)
       {
          if (a[i] == val)
          return i;
       }
       return -1;
    }
    public static void main(String args[]) {
      int a[] = {55, 29, 10, 40, 57, 41, 20, 24, 45,50}; // given array
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter the element to be searched : ");
      int val = sc.nextInt(); // value to be searched
      int n = a.length; // size of array
      int res = linearSearch(a, n, val);
      System.out.println();
      System.out.print("The elements of the array are : ");
      for (int i = 0; i < n; i++) {
         System.out.print(" " + a[i]);
       }
       System.out.println();
       System.out.println("Searching "+ val+".....");
       if (res == -1){
         System.out.println("Element is not present in the array");
       }else {
         System.out.println("Element "+ val + " is present at index " + res +" of array");
       }
    }
}
```

VARIABLE NAME	DATATYPE	DESCRIPTION
a[]	int (Array)	To store the array elements
Val	int	To store the element to be searched
N	int	To store the length of array
I	int	To initialize *for* loop
Sc	object	Object of Scanner class to accept user input
Res	int	To store the result of search

C. Write a java program to implement Binary search for searching an element in an array.

Ans.

```
import java.util.Scanner;
class BinarySearch {
   int binarySearch(int arr[], int l, int r, int x)
   {
      if (r >= l) {
         int mid = l + (r - l) / 2;
         if (arr[mid] == x){
            return mid;
         }
         else if (arr[mid] > x){
            return binarySearch(arr, l, mid - 1, x);
         }
         else{
            return binarySearch(arr, mid + 1, r, x);
         }
      }
       else{
         return -1;
      }
   }
   public static void main(String args[])
   {
      BinarySearch ob = new BinarySearch();
      int arr[] = { 2, 3, 4, 10, 40, 60, 80, 110};
      int n = arr.length;
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter the Element to be searched : ");
      int x = sc.nextInt();
      int result = ob.binarySearch(arr, 0, n - 1, x);
      System.out.println("Searching "+ x +".....");
      if (result == -1){
         System.out.println("Element not present");
       }
      else{
         System.out.println("Element "+ x +" found at index "+ result);
       }
   }
}
```

VARIABLE NAME	DATATYPE	DESCRIPTION
arr[]	int (Array)	To store the array elements
Val	int	To store the element to be searched
X	int	To store the length of array
Mid	int	To store the index of the middle element of array
L	int	Method variable to store first array index
R	int	Method variable to store last array index
I	int	To initialize *for* loop
Sc	object	Object of Scanner class to accept user input
Result	int	To store the result of search

ASSIGNMENT 10 : ARRAY (SORTING TECHNIQUES)

A. Write a java program to sort the following array using selection sort method, also display the array before & after sorting.

Ans.

```
public class SelectionSort
{
   void sort(int a[]) /* function to sort an array with selection sort */
   {
      int i, j, small;
      int n = a.length;
      for (i = 0; i < n-1; i++)
      {
         small = i; //minimum element in unsorted array
         for (j = i+1; j < n; j++)
         if (a[j] < a[small]) {
            small = j;
         }
         // Swap the minimum element with the first element
         int temp = a[small];
         a[small] = a[i];
         a[i] = temp;
      }
   }
   public static void main(String[] args) {
      int a[] = { 9, 67, 34,12,96,1, 49, 4, 19, 10};
      SelectionSort s = new SelectionSort();
      System.out.println("\nBefore sorting array elements are : ");

      int i;
      int n = a.length;
      for (i = 0; i < n; i++){
         System.out.print(a[i] + " ");
      }
      s.sort(a);
      System.out.println("\nAfter sorting array elements are : ");

      for (i = 0; i < n; i++) {
         System.out.print(a[i] + " ");
      }
      System.out.println();
   }
}
```

VARIABLE NAME	DATATYPE	DESCRIPTION
a[]	int (Array)	To store the array elements
Small	int	To store the minimum element in unsorted array
Temp	int	Temporary variable to swap the array elements
N	int	To store the length of array
i, j	int	To initialize *for* loop
S	object	Object of class to access methods

ASSIGNMENT 11 : ARRAY (SORTING TECHNIQUES)

Write a java program to sort the following array using bubble sort method.

Ans.

```
public class Bubble {
   static void bubbleSort (int a[])
   {
      int n = a.length;
      int i, j, temp;
      for (i = 0; i < n; i++)
      {
         for (j = i + 1; j < n; j++)
         {
            if (a[j] < a[i])
            {
               temp = a[i];
               a[i] = a[j];
               a[j] = temp;
            }
         }
      }
   }
   public static void main(String[] args) {
      int a[] = {35, 12, 45, 98, 87, 75, 10, 31, 11, 26};
      Bubble b = new Bubble();
      System.out.println("Before sorting array elements are :");
      int n = a.length;
      for (int i = 0; i < n; i++){
         System.out.print(a[i] + " ");
      }
      b.bubbleSort(a);
      System.out.println();
      System.out.println("After sorting array elements are :");
      for (int i = 0; i < n; i++){
         System.out.print(a[i] + " ");
      }
   }
}
```

VARIABLE NAME	DATATYPE	DESCRIPTION
a[]	int (Array)	To store the array elements
Temp	int	Temporary variable to swap the array elements
N	Int	To store the length of array
i, j	Int	To initialize *for* loop
B	object	Object of class to access methods

ASSIGNMENT 12 : STRING FUNCTIONS

A. Write a java program to define two strings “Computer” & “Applications” in string variables “str1” & “str2” respectively.

Apply the following string methods on them and display the output,

1. toUpperCase()
2. toLowerCase()
3. charAt()
4. compareTo()
5. compareToIgnoreCase()

6. concat()
7. equals()
8. equalsIgnore(
9. startsWith()
10. endsWith()

Ans.

```
public class StringFunc{
 public static void main(String[] args) {
   String str1 = "Computer";
   String str2 = "Applications";
   System.out.println("str1 = "+str1);
   System.out.println("str2 = "+str2+"\n");

   //toUpperCase()
   String str3 = str1.toUpperCase();
   System.out.println("1. str1 to Uppercase : "+str3);

   //toLowerCase()
   System.out.println("2. str2 to lowercase' : "+str2.toUpperCase());

   System.out.println("3. Character at 2 : "+str1.charAt(2));

   // comparing str1 with str2
   System.out.println("4. str1 compared to str2 : "+str1.compareTo(str2));

   System.out.println("5. str1 compared to str2 (IgnoreCase) : "+str2.compareToIgnoreCase(str1));

   //concat()
   System.out.println("6. Concatenate str1 & str2 : "+str1.concat(str2));

   //equals()
   System.out.println("7 a. str1 equals str2 : "+str1.equals(str2));
   System.out.println("  b. str1 equals str3 : "+str1.equals(str3));

   //equalsIgnoreCase()
   System.out.println("8 a. str1 equals str2 (Ignore) : "+str1.equalsIgnoreCase(str2));
   System.out.println("  b. str1 equals str3 (Ignore) : "+str1.equalsIgnoreCase(str3));

   //startsWith()
   System.out.println("9. str1 startsWith 'Com' : "+str1.startsWith("Com"));

   //endsWith()
   System.out.println("10. str1 endsWith 'ons' : "+str2.endsWith("ons"));
 }
}
```

VARIABLE NAME	DATATYPE	DESCRIPTION
str1	String	To store “Computer”
str2	String	To store “Applications”
str3	String	To store the result of toUpperCase() method

ASSIGNMENT 13

WAP to input a sentence.Find those words that begin and end with a vowel ,Also count its total occurrences in the sentences.
Ans already iven

ASSIGNMENT 14 : FACTORIAL OF A NUMBER

A. Write a java program to calculate the factorial of a number; display the number along with its factorial result.

> ***Note : Factorial*** *of n is the product of all positive descending integers. Factorial of n is denoted by n!.*
> *For example:*
> *4! = 4*3*2*1 = 24*
> *5! = 5*4*3*2*1 = 120*

Ans.

```
import java.io.*;
import java.util.Scanner;
class Factorial{
        public static void main(String args[]) {
                int n, c, fact = 1;
                n = 10;
                if ( n < 0 ) {
                        System.out.println("Number should be non-negative.");
                }
                else {
                        for(c= 1 ; c <=n ; c++)
                        fact =fact*c;
                        System.out.println("Factorial of "+n+" is ="+fact);
                }
        }
}
```

VARIABLE NAME	DATATYPE	PURPOSE
N	int	For storing the number whose factorial has to be calculated
C	Int	For initializing *for* loop
Fact	Int	For initializing & storing the factorial of n.

ASSIGNMENT 15 : PALINDROME NUMBER & DUCK NUMBER

A. Write a java program to check whether a number is a palindrome number or not.

> ***Note :*** *A* ***palindrome number*** *is a number that is same after reverse. For example 545, 151, 34543, 343, 171, 48984 are the palindrome numbers. It can also be a string like LOL, MADAM etc.*

Ans.

```
class PalindromeExample{
        public static void main(String args[]){
                int r, sum = 0, temp;
                int n = 454;  //It is the number variable to be checked for palindrome
                temp = n;
                while(n>0){
                        r=n%10;  //getting remainder
                        sum = (sum*10) + r;
                        n = n / 10;
                }
                if(temp==sum){
                        System.out.println("Entered number is a Palindrome number ");
                }                                       }
                else{                                                   }
                                }
```

```
System.out.println("Enter
ed number is not a
Palindrome number  ");
```

VARIABLE NAME	DATATYPE	PURPOSE
R	Int	For storing the remainder of n%10
N	Int	For storing the number to be checked
Sum	Int	For storing the sum
Temp	Int	A temporary variable for storing the initial number to be checked.

ASSIGNMENT 16 : FIBONACCI SERIES

A. Write a java program to display Fibonacci series up-to 15 terms.
e.g. 0, 1, 1, 2, 3, 5, 8, 13

> ***Note :*** *In* ***fibonacci series,*** next number is the sum of previous two numbers,
> *for example 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55….,etc.*
> *The first two numbers of fibonacci series are 0 and 1.*

Ans.

```
import java.util.Scanner;
public class Fibonacci{
        public static void main(String[] args) {
                int a, b, c;
                a = 0;
                b = 1;
                System.out.println("The Fibonacci series till 15 terms are :");
                for (int i = 1; i <= 15; ++i) {
                        System.out.print(a + " ");
                        c = a + b;
                        a = b;
                        b = c;
                }
        }
}
```

VARIABLE NAME	DATATYPE	PURPOSE
a, b	Int	For storing the initial values of the series
C	Int	For storing the sum of previous two values

ASSIGNMENT 16 : PATTERNS – 1

Write a program to display the following star patterns using two different java methods.

```
*                    * * * * *
* *                  * * * *
* * *                * * *
* * * *              * *
* * * * *            *
```

Ans.

```
public class STAR{
   public static void StarPyramid1(int n) {
      int i, j;
         //Pattern 1
      for(i=1; i<=n; i++){
         for(j=0; j<i; j++){
            System.out.print("* ");
         }
         System.out.println();
      }
   }
   public static void StarPyramid2(int n) {
      int i, j;
         //Pattern 2
      for(i=n-1; i>=0; i--){
         for(j=0; j<=i; j++){
            System.out.print("* ");
         }
         System.out.println();
      }
   }
    public static void main(){
      StarPyramid1(5);
      StarPyramid2(5);
   }
}
```

VARIABLE NAME	DATATYPE	PURPOSE
i & j	Int	For initializing outer & inner for loops (i.e. number of rows & columns of the pattern)
n	Int	To take user input for no. of rows while invoking the function.

ASSIGNMENT 17 : PATTERNS – 2

A. Write a program to display the following number pattern.

```
1
1 2
1 2  3
1 2  3  4
1 2  3  4  5
```

Ans.

```
public class NoSeries{
    public static void NumPyramid(int n) {
        int i, j,num;
        for(i=0; i<n; i++) // outer loop for rows
        {
            num=1;
            for(j=0; j<=i; j++) // inner loop for rows
            {
```

```
            System.out.print(num+ " ");
            num++;
          }
          System.out.println();
        }
      }
      public static void main(){
        NumPyramid(5);
      }
    }
```

VARIABLE NAME	DATATYPE	PURPOSE
i & j	Int	For initializing outer & inner for loops (i.e. no. of rows & columns of the pattern)
Num	Int	To store & initialize the pattern with a number

A. Write a program to display the following number pattern.

```
    1
   1 2
  1 2 3
 1 2 3 4
1 2 3 4 5
```

Ans.

```
import java.util.*;
public class numberpattern
{
  public static void main(String[] args)
  {
    Scanner sc = new Scanner(System.in);
    System.out.print("Enter the number of rows: ");
    int rows = sc.nextInt();
    int num = 1;
    for (int i = 0; i < rows; i++) {
      for (int j = 1; j < rows - i; j++) {
        System.out.print(" ");
      }
      for (int k = 0; k <= i; k++) {
        System.out.print(num++);
      }
      num = 1;
      System.out.println();
    }
  }
}
```

VARIABLE NAME	DATATYPE	PURPOSE
i & j	Int	For initializing outer & inner for loops (i.e. no. of rows & columns of the pattern)
Rows	Int	To store the number of rows of pattern
Sc	object	Object of Scanner class

ASSIGNMENT 18 : PATTERNS – 3

A. Write a program to display the following number pattern.

1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
Ans.

```
import java.util.Scanner;
public class number
{

        public static void main(String[] args)
        {
           Scanner sc = new Scanner(System.in); //Taking rows value from the user
           System.out.println("Enter the number of rows: ");
           int rows = sc.nextInt();
           for (int i = 1; i <= rows; i++)
           {
              for (int j = 1; j <= i; j++)
              {
                 System.out.print(i+" ");
              }

              System.out.println();
           }
           //sc.close();
        }
     }
```

VARIABLE NAME	DATATYPE	PURPOSE
i & j	Int	For initializing outer & inner for loops (i.e. no. of rows & columns of the pattern)
Rows	Int	To store the number of rows in the pattern

ASSIGNMENT 19 : PATTERNS – 4

A. Write a program to display the following number pattern.

A
A B
A B C
A B C D
A B C D E
A B C D E F

Ans.

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

```
public class AlphaPattern
{
   public static void main(){
      int alpha = 65;
      for (int i = 0; i < 6; i++)
      {
         for (int j = 0; j <= i; j++)
         {
            System.out.print((char) (alpha + j) + " ");
         }
         System.out.println();
      }
```

```
    }
}
```

VARIABLE NAME	DATATYPE	PURPOSE
i & j	Int	For initializing outer & inner for loops (i.e. no. of rows & columns of the pattern)
Alpha	Int	To store the ASCII code of the first alphabet (i.e. A)

ASSIGNMENT 20