Name:- Milind Kailas Tajane
Roll No:- CS061

Date:-_____

Practical No:1

AIM:- Write a java program to create a person class with the attribute name and age. Create instances and their attributes using constructor and print their name and age.

CODE:-

```
class Person {
    String name;
    int age;

    // Constructor to initialize name and age
    public Person(String name, int age) {
        this.name = name;
        this.age = age;
    }

    // Method to display details
    public void display() {
        System.out.println("Name: " + name);
        System.out.println("Age: " + age);
    }

    public static void main(String[] args) {
        // Creating instances of Person
        Person person = new Person("Milind", 22);

        // Displaying details
        person.display();
    }
}
```

Output:-

```
C:\Coding\Milind_MCA\Java Practicals>javac Person.java

C:\Coding\Milind_MCA\Java Practicals>java Person
Name: Milind
Age: 22
```

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Practical No:2

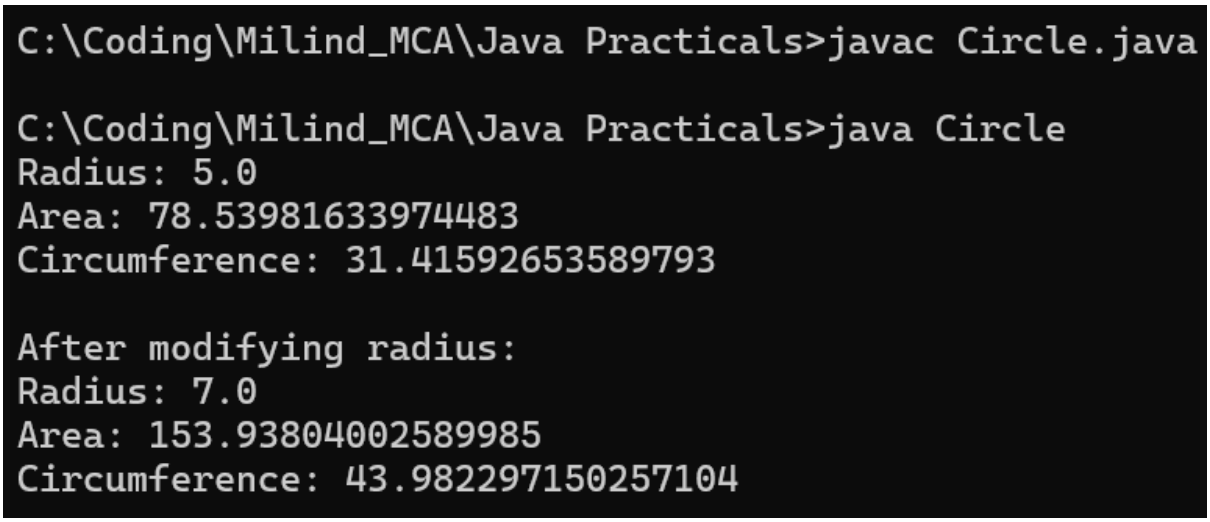
AIM:- Write a java program to create circle with radius attribute , you can access and modify the attributes and calculate area and circumference of circle.

CODE:-

```
class Circle {
    double radius;

    // Constructor to initialize radius
    public Circle(double radius) {
        this.radius = radius;
    }

    // Getter method for radius
    public double getRadius() {
        return radius;
    }

    // Setter method for radius
    public void setRadius(double radius) {
        this.radius = radius;
    }

    // Method to calculate area
    public double calculateArea() {
        return Math.PI * radius * radius;
    }

    // Method to calculate circumference
    public double calculateCircumference() {
        return 2 * Math.PI * radius;
    }

    public static void main(String[] args) {
        // Creating an instance of Circle
        Circle circle = new Circle(5.0);

        // Displaying details
        System.out.println("Radius: " + circle.getRadius());
        System.out.println("Area: " + circle.calculateArea());
```

```
        System.out.println("Circumference: " + circle.calculateCircumference());

        // Modifying radius
        circle.setRadius(7.0);
        System.out.println("\nAfter modifying radius:");
        System.out.println("Radius: " + circle.getRadius());
        System.out.println("Area: " + circle.calculateArea());
        System.out.println("Circumference: " + circle.calculateCircumference());
    }
}
```

Output:-



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Practical No: 3

AIM:- Write a java program to create library with the collection of books and methods two add or remove books.

CODE:-

```
import java.util.ArrayList;

class Library {
    private ArrayList<String> books;

    public Library() { books = new ArrayList<>(); }
    public void addBook(String book) { books.add(book); }
    public void removeBook(String book) { books.remove(book); }
    public void displayBooks() {
        System.out.println("Books in library: " + books);
    }

    public static void main(String[] args) {
        Library library = new Library();
        library.addBook("The Great Gatsby");
        library.addBook("1984");
        library.displayBooks();
        library.removeBook("1984");
        library.displayBooks();
    }
}
```

Output:-

```
C:\Coding\Milind_MCA\Java Practicals>javac Library.java

C:\Coding\Milind_MCA\Java Practicals>java Library
Books in library: [The Great Gatsby, 1984]
Books in library: [The Great Gatsby]

C:\Coding\Milind_MCA\Java Practicals>
```

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Practical No: 4

AIM:- Write a java program convert the rupees amount to words.

CODE:-

```
import java.text.DecimalFormat;

class NumberToWords {
   private static final String[] units = {"", "One", "Two", "Three", "Four", "Five", "Six",
"Seven", "Eight", "Nine", "Ten", "Eleven", "Twelve", "Thirteen", "Fourteen", "Fifteen",
"Sixteen", "Seventeen", "Eighteen", "Nineteen"};
   private static final String[] tens = {"", "", "Twenty", "Thirty", "Forty", "Fifty", "Sixty",
"Seventy", "Eighty", "Ninety"};

   public static String convert(int number) {
      if (number == 0) return "Zero";
      return convertNumberToWords(number);
   }

   private static String convertNumberToWords(int number) {
      if (number < 20) return units[number];
      if (number < 100) return tens[number / 10] + (number % 10 != 0 ? " " + units[number %
10] : "");
      if (number < 1000) return units[number / 100] + " Hundred" + (number % 100 != 0 ? " "
+ convertNumberToWords(number % 100) : "");
      if (number < 100000) return convertNumberToWords(number / 1000) + " Thousand" +
(number % 1000 != 0 ? " " + convertNumberToWords(number % 1000) : "");
      if (number < 10000000) return convertNumberToWords(number / 100000) + " Lakh" +
(number % 100000 != 0 ? " " + convertNumberToWords(number % 100000) : "");
      return convertNumberToWords(number / 10000000) + " Crore" + (number % 10000000
!= 0 ? " " + convertNumberToWords(number % 10000000) : "");
   }

   public static void main(String[] args) {
      int amount = 230020;
      System.out.println("Rupees " + new DecimalFormat("#,##0").format(amount) + " in
words: " + convert(amount) + " Rupees");
   }
}
```

Output:-

```
C:\Coding\Milind_MCA\Java Practicals>javac NumberToWords.java

C:\Coding\Milind_MCA\Java Practicals>java NumberToWords
Rupees 230,020 in words: Two Lakh Thirty Thousand Twenty Rupees

C:\Coding\Milind_MCA\Java Practicals>
```

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Practical No: 5

AIM:- Write a java program to convert Celsius to Fahrenheit and vice versa.

CODE:-

```
import java.util.Scanner;
class TemperatureConverter {
    public static double celsiusToFahrenheit(double celsius) {
        return (celsius * 9/5) + 32;
    }
    public static double fahrenheitToCelsius(double fahrenheit) {
        return (fahrenheit - 32) * 5/9;
    }
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter temperature: ");
        double temperature = scanner.nextDouble();
        System.out.print("Convert to (C/F): ");
        char choice = scanner.next().charAt(0);
        if (choice == 'C' || choice == 'c') {
            System.out.println("Temperature in Celsius: " + fahrenheitToCelsius(temperature));
        } else if (choice == 'F' || choice == 'f') {
            System.out.println("Temperature in Fahrenheit: " +
celsiusToFahrenheit(temperature));
        } else {
            System.out.println("Invalid choice");
        }
        scanner.close();
    }
}
```

Output:-

```
C:\Coding\Milind_MCA\Java Practicals>java TemperatureConverter
Enter temperature: 76
Convert to (C/F): f
Temperature in Fahrenheit: 168.8

C:\Coding\Milind_MCA\Java Practicals>
```

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Practical No: 6

AIM:- Write a java program to print the sum of given number.

CODE:-

```
import java.util.Scanner;

class SumCalculator {
    public static int calculateSum(int number) {
        int sum = 0;
        while (number != 0) {
            sum += number % 10;
            number /= 10;
        }
        return sum;
    }

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int number = scanner.nextInt();

        System.out.println("Sum of digits: " + calculateSum(number));
        scanner.close();
    }
}
```

Output:-

```
C:\Coding\Milind_MCA\Java Practicals>javac SumCalculator.java

C:\Coding\Milind_MCA\Java Practicals>java SumCalculator
Enter a number: 234
Sum of digits: 9

C:\Coding\Milind_MCA\Java Practicals>
```

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Practical No: 7

AIM:- Write a java program to perform all the arithmetic operator.

CODE:-

```
import java.util.Scanner;

class ArithmeticOperations {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter first number: ");
        double num1 = scanner.nextDouble();

        System.out.print("Enter second number: ");
        double num2 = scanner.nextDouble();

        System.out.println("Addition: " + (num1 + num2));
        System.out.println("Subtraction: " + (num1 - num2));
        System.out.println("Multiplication: " + (num1 * num2));
        System.out.println("Division: " + (num1 / num2));
        System.out.println("Modulus: " + (num1 % num2));

        scanner.close();
    }
}
```

Output:-

```
C:\Coding\Milind_MCA\Java Practicals>javac ArithmeticOperations.java

C:\Coding\Milind_MCA\Java Practicals>java ArithmeticOperations
Enter first number: 2
Enter second number: 5
Addition: 7.0
Subtraction: -3.0
Multiplication: 10.0
Division: 0.4
Modulus: 2.0

C:\Coding\Milind_MCA\Java Practicals>
```

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Practical No: 8

AIM:- .Write a java program to perform bitwise operator.

CODE:-

```
import java.util.Scanner;

class BitwiseOperations {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter first integer: ");
        int num1 = scanner.nextInt();

        System.out.print("Enter second integer: ");
        int num2 = scanner.nextInt();

        System.out.println("Bitwise AND: " + (num1 & num2));
        System.out.println("Bitwise OR: " + (num1 | num2));
        System.out.println("Bitwise XOR: " + (num1 ^ num2));
        System.out.println("Bitwise Complement of first number: " + (~num1));
        System.out.println("Left Shift (num1 << 2): " + (num1 << 2));
        System.out.println("Right Shift (num1 >> 2): " + (num1 >> 2));

        scanner.close();
    }
}
```

Output:-

```
C:\Coding\Milind_MCA\Java Practicals>javac BitwiseOperations.java

C:\Coding\Milind_MCA\Java Practicals>java BitwiseOperations
Enter first integer: 2
Enter second integer: -7
Bitwise AND: 0
Bitwise OR: -5
Bitwise XOR: -5
Bitwise Complement of first number: -3
Left Shift (num1 << 2): 8
Right Shift (num1 >> 2): 0

C:\Coding\Milind_MCA\Java Practicals>
```

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Practical No: 9

AIM:- Write a java program to check leap year.

CODE:-

```
import java.util.Scanner;

class LeapYearChecker {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter a year: ");
        int year = scanner.nextInt();

        if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {
            System.out.println(year + " is a Leap Year.");
        } else {
            System.out.println(year + " is not a Leap Year.");
        }

        scanner.close();
    }
}
```

Output:-

```
C:\Coding\Milind_MCA\Java Practicals>javac LeapYearChecker.java

C:\Coding\Milind_MCA\Java Practicals>java LeapYearChecker
Enter a year: 2025
2025 is not a Leap Year.

C:\Coding\Milind_MCA\Java Practicals>
```

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Practical No: 10

AIM:- .Write a java program to Convert decimal to binary, octal, hex.

CODE:-

```
import java.util.Scanner;

class NumberConverter {
   public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);

      System.out.print("Enter a decimal number: ");
      int decimal = scanner.nextInt();

      System.out.println("Binary: " + Integer.toBinaryString(decimal));
      System.out.println("Octal: " + Integer.toOctalString(decimal));
      System.out.println("Hexadecimal: " + Integer.toHexString(decimal).toUpperCase());

      scanner.close();
   }
}
```

Output:-

```
C:\Coding\Milind_MCA\Java Practicals>javac NumberConverter.java

C:\Coding\Milind_MCA\Java Practicals>java NumberConverter
Enter a decimal number: 34
Binary: 100010
Octal: 42
Hexadecimal: 22

C:\Coding\Milind_MCA\Java Practicals>
```

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Practical No: 11

AIM:- Write a java program to Print prime numbers 1 to 100.

CODE:-

```
class PrimeNumbers {
    public static void main(String[] args) {
        System.out.println("Prime numbers from 1 to 100:");
        for (int num = 2; num <= 100; num++) {
            if (isPrime(num)) {
                System.out.print(num + " ");
            }
        }
    }

    public static boolean isPrime(int n) {
        if (n < 2) return false;
        for (int i = 2; i <= Math.sqrt(n); i++) {
            if (n % i == 0) return false;
        }
        return true;
    }
}
```

Output:-

```
C:\Coding\Milind_MCA\Java Practicals>javac PrimeNumbers.java

C:\Coding\Milind_MCA\Java Practicals>java PrimeNumbers
Prime numbers from 1 to 100:
2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97
C:\Coding\Milind_MCA\Java Practicals>
```

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Practical No: 12

AIM:- Write a java program to print Factorial of a number.

CODE:-

```
import java.util.Scanner;

class Factorial {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int num = scanner.nextInt();
        System.out.println("Factorial of " + num + " is: " + factorial(num));
        scanner.close();
    }

    public static long factorial(int n) {
        long fact = 1;
        for (int i = 1; i <= n; i++) {
            fact *= i;
        }
        return fact;
    }
}
```

Output:-

```
C:\Coding\Milind_MCA\Java Practicals>javac Factorial.java

C:\Coding\Milind_MCA\Java Practicals>java Factorial
Enter a number: 7
Factorial of 7 is: 5040

C:\Coding\Milind_MCA\Java Practicals>
```

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Practical No: 13

AIM:- Write a java program to print the pattern.

CODE:-

```
import java.util.Scanner;

class PatternPrinter {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter the number of rows: ");
        int rows = scanner.nextInt();

        for (int i = 1; i <= rows; i++) {
            for (int j = 1; j <= i; j++) {
                System.out.print("* ");
            }
            System.out.println();
        }

        scanner.close();
    }
}
```

Output:-

```
C:\Coding\Milind_MCA\Java Practicals>javac PatternPrinter.java

C:\Coding\Milind_MCA\Java Practicals>java PatternPrinter
Enter the number of rows: 5
*
* *
* * *
* * * *
* * * * *

C:\Coding\Milind_MCA\Java Practicals>
```