

Programming Practices

Program 1:WAP to find factorial of a number.

Code:

```
import java.util.Scanner;
public class Prog1 {
    public static void factorial(int number) {
        long fact = 1;
        for (int i = 1; i <= number; i++) {
            fact = fact * i;
        }
        System.out.println("Factorial of " + number + " is:" + fact);
    }
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the number:");
        int number = sc.nextInt();
        factorial(number);
    }
}
```

Prog.2 WAP to print Fibonacci Series.

Code:

```
import java.util.Scanner;
public class Prog2 {
    public static void fibonacci(int number) {
        int temp1 = 0;
        int temp2 = 1;
        int temp3;
        System.out.print("Fibonacci Series : ");
        System.out.print(temp1 + " " + temp2);
        for (int i = 1; i < number; i++) {
            temp3 = temp1 + temp2;
            System.out.print(" " + temp3);
            temp1 = temp2;
            temp2 = temp3;
        }
    }
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the number: ");
        int number = sc.nextInt();
        fibonacci(number);
    }
}
```

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Prog.3 Greatest Factorial as the factor of a number.

Code:

```
import java.util.Scanner;

public class Prog3 {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number : ");
        long number = sc.nextLong();
        long fact = 1;
        int ans = 0;
        for (int i = 1; i <= 30; i++) {
            fact = fact * i;
            if (number % fact == 0) {
                ans = i;
            }
        }
        System.out.println("Greatest factorial as factor in number is: " + ans);
    }
}
```

Prog.4 WAP to check for a palindrome.

Code:

```
import java.util.Scanner;

public class Prog4 {
    public static void isPalindrome(long number) {
        long temp, rev, rem;
        temp = number;
        rev = 0;
        while (temp > 0) {
            rem = temp % 10;
            rev = (rev * 10) + rem;
            temp = temp / 10;
        }
        if (rev == number) {
            System.out.println("Number is Palindrome.");
        } else {
            System.out.println("Not a Palindrome.");
        }
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a Number:");
        long number = sc.nextLong();
        isPalindrome(number);
    }
}
```

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}

Prog.5 WAP a program to reverse a string.

Code:

```
import java.util.Scanner;

public class Prog5 {
    public static void reverse(String str) {
        String revstr = "";
        char ch;
        for (int i = 0; i < str.length(); i++) {
            ch = str.charAt(i);
            revstr = ch + revstr;
        }
        System.out.println("Reversed String :" + revstr);
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a String:");
        String str = sc.nextLine();
        reverse(str);
    }
}
```

Prog.6 Check weather the number is prime or not.

Code:

```
import java.util.Scanner;

public class Prog6 {
    public static void isPrime(int number) {

        int count = 0;
        for (int i = 2; i < number; i++) {
            if (number % i == 0) {
                count = count + 1;
            }
        }
        if (count == 0) {
            System.out.println("Number is prime.");
        } else {
            System.out.println("Number is not prime.");
        }
    }

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

Prog.7 Perfect Square in Range.

Code:

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

```
public class Prog7 {  
    public static void perfectSquare(int number) {  
        for (int i = 1; i <= number; i++) {  
            for (int j = 1; j < i; j++) {  
                if (i % j == 0 && i == j * j) {  
                    System.out.print(i + " ");  
                }  
            }  
        }  
    }  
}  
  
public static void main(String[] args) {  
    Scanner sc = new Scanner(System.in);  
    System.out.print("Enter a number: ");  
    int number = sc.nextInt();  
    perfectSquare(number);  
}  
}
```

Prog.8 Largest number in the unsorted Array.

Code:

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

```
public class Prog8 {  
    static int LargestNumber(int[] array) {  
        if (array.length == 0) {  
            System.out.println("Array is empty.");  
            return 0;  
        }  
  
        int largest = array[0];  
        for (int i = 1; i < array.length; i++) {  
            if (array[i] > largest) {  
                largest = array[i];  
            }  
        }  
        return largest;  
    }  
}  
  
public static void main(String[] args) {  
    Scanner sc = new Scanner(System.in);  
    System.out.print("Enter the size of the array: ");
```

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```
int size = sc.nextInt();
int[] numbers = new int[size];
System.out.println("Enter the elements of the array:");
for (int i = 0; i < size; i++) {
    numbers[i] = sc.nextInt();
    int largest = LargestNumber(numbers);
    System.out.println("The largest number in the array is: " + largest);
}

}

}
```

Prog.9 Decimal number to Binary number.

Code:

```
import java.util.Scanner;

public class Prog9 {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a decimal number: ");
        int number = sc.nextInt();

        String binaryRepresentation = decimalToBinary(number);

        System.out.println("Binary representation: " + binaryRepresentation);
    }

    static String decimalToBinary(int number) {
        if (number == 0) {
            return "0";
        }

        StringBuilder binary = new StringBuilder();
        while (number > 0) {
            int remainder = number % 2;
            binary.insert(0, remainder);
            number /= 2;
        }

        return binary.toString();
    }
}
```

Prog.10 Decimal number to hexadecimal number

Code:

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

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```
public class Prog10 {
    static String decimalToHexadecimal(int number) {
        if (number == 0) {
            return "0";
        }

        StringBuilder hexadecimal = new StringBuilder();
        char[] hexChars = "0123456789ABCDEF".toCharArray();

        while (number > 0) {
            int remainder = number % 16;
            hexadecimal.insert(0, hexChars[remainder]);
            number /= 16;
        }

        return hexadecimal.toString();
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a decimal number: ");
        int number = sc.nextInt();
        String hexadecimal = decimalToHexadecimal(number);
        System.out.println("Hexadecimal representation: " + hexadecimal);
    }
}
```

Prog.11 Program to check for a happy number.

Code:

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

```
public class Prog11 {
    public static void isHappyNumber(int number) {
        int temp = number;
        int sum = 0;
        int rem = 0;
        while (temp > 1) {
            while (temp > 0) {
                rem = temp % 10;
                sum = sum + (rem * rem);
                temp = temp / 10;
            }
            temp = sum;
        }
        if (temp == 1) {
            System.out.println("Is a happy number.");
        }
    }
}
```

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```
        } else {  
            System.out.println("Is not a happy number.");  
        }  
    }  
  
    public static void main(String[] args) {  
        Scanner sc = new Scanner(System.in);  
        System.out.print("Enter a number: ");  
        int number = sc.nextInt();  
        isHappyNumber(number);  
    }  
}
```

Prog.12 Program to check for a Armstrong number

Code:

```
import java.util.Scanner;  
  
public class Prog12 {  
    public static void isArmstrong(int number) {  
        int temp = number;  
        int sum = 0;  
        int rem = 0;  
        while (temp != 0) {  
            rem = temp % 10;  
            sum = sum + (rem * rem * rem);  
            temp = temp / 10;  
        }  
        System.out.println(sum);  
        if (number == sum) {  
            System.out.println("Is Armstrong Number.");  
        } else {  
            System.out.println("Not a Armstrong.");  
        }  
    }  
  
    public static void main(String[] args) {  
        Scanner sc = new Scanner(System.in);  
        System.out.print("Enter a number: ");  
        int number = sc.nextInt();  
        isArmstrong(number);  
    }  
}
```

Prog.13 WAP to find a closest number to given number which is divisible by another given number.

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```
import java.util.Scanner;

public class Prog13 {
    public static void closest(int number, int factor) {
        if (number % factor != 0) {
            for (int i = number; i > 1; i--) {
                if (i % factor == 0) {
                    System.out.println(i + " is closest multiple of " + factor + " to " + number);
                    break;
                }
            }
        }
    }
}

public static void main(String[] args) {
    Scanner sc = new Scanner(System.in);
    System.out.print("Enter the number: ");
    int number = sc.nextInt();
    System.out.print("Enter the factor: ");
    int factor = sc.nextInt();
    closest(number, factor);
}
}
```

Prog 14. WAP to compute nCr.

Code:

```
import java.util.Scanner;

public class Prog14 {
    public static long factorial(int number) {
        long fact = 1;
        for (int i = 1; i <= number; i++) {
            fact = fact * i;
        }
        return fact;
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter value of n : ");
        int n = sc.nextInt();
        System.out.print("Enter value of r : ");
        int r = sc.nextInt();
        long ncr;
        ncr = factorial(n) / (factorial(r) * factorial(n - r));
        System.out.print("nCr : ");
    }
}
```


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```
        System.out.println(nCr);  
    }  
}
```

Prog.15 WAP to compute nPr

Code:

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

```
public class Prog15 {  
    public static long factorial(int number) {  
        long fact = 1;  
        for (int i = 1; i <= number; i++) {  
            fact = fact * i;  
        }  
        return fact;  
    }  
  
    public static void main(String[] args) {  
        Scanner sc = new Scanner(System.in);  
        System.out.print("Enter value of n : ");  
        int n = sc.nextInt();  
        System.out.print("Enter value of r : ");  
        int r = sc.nextInt();  
        long nPr;  
        nCr = factorial(n) / factorial(n - r);  
        System.out.print("nPr : ");  
        System.out.println(nPr);  
    }  
}
```

Prog.16 Check for anagram

Code:

```
import java.util.Arrays;
```

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

```
public class Prog16 {  
  
    static boolean anagrams(String str1, String str2) {  
        char[] charArray1 = str1.replaceAll("\\s", "").toCharArray();  
        char[] charArray2 = str2.replaceAll("\\s", "").toCharArray();  
        Arrays.sort(charArray1);  
        Arrays.sort(charArray2);  
        return Arrays.equals(charArray1, charArray2);  
    }  
  
    public static void main(String[] args) {  
        Scanner sc = new Scanner(System.in);
```

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```
System.out.print("Enter the first string: ");
String str1 = scanner.nextLine().toLowerCase();

System.out.print("Enter the second string: ");
String str2 = scanner.nextLine().toLowerCase();

if (anagrams(str1, str2)) {
    System.out.println("The strings are anagrams.");
} else {
    System.out.println("The strings are not anagrams.");
}
}
```

Prog.17 WAP to find the roots of quadratic equation.

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

```
public class Prog17 {
    public static void roots(float a, float b, float c) {
        float root1 = (-b + Math.sqrt((b * b) - (4 * a * c))) / (2.0 * a);
        float root2 = (-b - Math.sqrt((b * b) - (4 * a * c))) / (2.0 * a);
        System.out.println("Roots are : " + root1 + " , " + root2);
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        float a, b, c;
        System.out.print("Enter Coefficient of x^2 : ");
        a = sc.nextFloat();
        System.out.print("Enter Coefficient of x : ");
        b = sc.nextFloat();
        System.out.print("Enter Constant : ");
        c = sc.nextFloat();
        roots(a, b, c);
    }
}
```

Prog.18 WAP a program to perform linear search.

Code:

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

```
public class Prog18 {
    public static int linearSearch(int[] array, int target) {
        for (int i = 0; i < array.length; i++) {
            if (array[i] == target) {
                return i;
            }
        }
    }
}
```

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```
        return -1;
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the size of the array: ");
        int size = sc.nextInt();

        int[] array = new int[size];

        System.out.println("Enter the elements of the array:");
        for (int i = 0; i < size; i++) {
            array[i] = sc.nextInt();
        }

        System.out.print("Enter the element to search for: ");
        int number = sc.nextInt();
        int index = linearSearch(array, number);

        if (index != -1) {
            System.out.println("Element " + number + " found at index " + index);
        } else {
            System.out.println("Element " + number + " not found in the array");
        }
    }
}
```

Prog.19 WAP to perform binary search.

Code:

```
import java.util.Scanner;

public class Prog19 {
    static int binarySearch(int[] array, int number) {
        int left = 0;
        int right = array.length - 1;

        while (left <= right) {
            int mid = left + (right - left) / 2;

            if (array[mid] == number) {
                return mid;
            } else if (array[mid] < number) {
                left = mid + 1;
            } else {
                right = mid - 1;
            }
        }
    }
}
```

```
        return -1;
    }

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

        System.out.print("Enter the size of the sorted array: ");
        int size = sc.nextInt();

        int[] array = new int[size];

        System.out.println("Enter the sorted elements of the array:");
        for (int i = 0; i < size; i++) {
            array[i] = sc.nextInt();
        }
        System.out.print("Enter the element to search for: ");
        int number = sc.nextInt();

        int index = binarySearch(array, number);

        if (index != -1) {
            System.out.println("Element " + number + " found at index " + index);
        } else {
            System.out.println("Element " + number + " not found in the array");
        }
    }
}
```

Prog.20 Separate out the array in odd and even .

Code:

```
import java.util.Scanner;

public class Prog20 {
    static void printArray(int[] array, int size) {
        for (int i = 0; i < size; i++) {
            System.out.print(array[i] + " ");
        }
        System.out.println();
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the size of the array: ");
        int size = sc.nextInt();
```

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```
int[] array = new int[size];
System.out.println("Enter the elements of the array:");
for (int i = 0; i < size; i++) {
    array[i] = sc.nextInt();
}

int[] evenArray = new int[size];
int[] oddArray = new int[size];
int evenIndex = 0, oddIndex = 0;

for (int i = 0; i < size; i++) {
    if (array[i] % 2 == 0) {
        evenArray[evenIndex++] = array[i];
    } else {
        oddArray[oddIndex++] = array[i];
    }
}
System.out.println("Even numbers:");
printArray(evenArray, evenIndex);
System.out.println("Odd numbers:");
printArray(oddArray, oddIndex);
}
}
```

Prog.21 Number of zeros and ones in binary number system.

Code:

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

```
public class Prog21 {
    static int noOnes(long binaryNumber) {
        int count = 0;
        while (binaryNumber > 0) {
            if (binaryNumber % 10 == 1) {
                count++;
            }
            binaryNumber /= 10;
        }
        return count;
    }
}
```

```
static int noZeros(long binaryNumber) {
    int count = 0;
    while (binaryNumber > 0) {
        if (binaryNumber % 10 == 0) {
            count++;
        }
        binaryNumber /= 10;
    }
}
```

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```
    }  
    return count;  
}  
  
public static void main(String[] args) {  
    Scanner sc = new Scanner(System.in);  
  
    System.out.print("Enter a binary number: ");  
    long binaryNumber = sc.nextLong();  
  
    int Ones = noOnes(binaryNumber);  
    int Zeros = noZeros(binaryNumber);  
    System.out.println("Number of 0s: " + Zeros);  
    System.out.println("Number of 1s: " + Ones);  
}  
}
```

Prog.22 WAP to print Star pattern.

Code:

```
import java.util.Scanner;  
  
public class Prog22{  
    public static void main(String[] args) {  
        Scanner sc = new Scanner(System.in);  
        System.out.print("Enter the number of rows: ");  
        int numRows = sc.nextInt();  
        printStarPattern(numRows);  
    }  
  
    static void printStarPattern(int rows) {  
        for (int i = 1; i <= rows; i++) {  
  
            for (int j = 1; j <= rows - i; j++) {  
                System.out.print(" ");  
            }  
            for (int k = 1; k <= 2 * i - 1; k++) {  
                System.out.print("*");  
            }  
            System.out.println();  
        }  
    }  
}
```

Prog.23 WAP to perform a bitwise OR of 2 binary number in python.

Code:

```
def binary_or(binary_num1, binary_num2):  
    num1 = int(binary_num1, 2)
```

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```
num2 = int(binary_num2, 2)
result = num1 | num2

result_binary = bin(result)[2:]

return result_binary
binary_number1 = input("Enter the first binary number: ")
binary_number2 = input("Enter the second binary number: ")
result_binary = binary_or(binary_number1, binary_number2)
print(f"Bitwise OR of {binary_number1} and {binary_number2} is: {result_binary}")
```

Prog.24 WAP to perform a bitwise AND of 2 binary numbers.

Code:

```
def binary_or(binary_num1, binary_num2):
    num1 = int(binary_num1, 2)
    num2 = int(binary_num2, 2)
    result = num1 & num2

    result_binary = bin(result)[2:]

    return result_binary
binary_number1 = input("Enter the first binary number: ")
binary_number2 = input("Enter the second binary number: ")
result_binary = binary_or(binary_number1, binary_number2)
print(f"Bitwise AND of {binary_number1} and {binary_number2} is: {result_binary}")
```

Prog.25 ASCII of 0-9 and Alphabate.

Code:

```
public class Prog25 {
    public static void main(String[] args) {
        // Print ASCII values of digits 0-9
        System.out.println("ASCII values of digits 0-9:");
        for (int digit = 0; digit < 10; digit++) {
            int asciiValue = (int) '0' + digit;
            System.out.println(digit + ": " + asciiValue);
        }

        // Print ASCII values of alphabets a-z
        System.out.println("\nASCII values of alphabets a-z:");
        for (char ch = 'a'; ch <= 'z'; ch++) {
            int asciiValue = (int) ch;
            System.out.println(ch + ": " + asciiValue);
        }
    }
}
```