

1. Write a Java Program to find GCD of two given numbers.

```
package Assig1;
import java.util.Scanner;

public class Q1{
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.println("Enter the first number:");
        int number1 = scanner.nextInt();

        System.out.println("Enter the second number:");
        int number2 = scanner.nextInt();

        int gcd = findGCD(number1, number2);
        System.out.println("The GCD of " + number1 + " and " + number2 + "
is: " + gcd);

        scanner.close();
    }

    public static int findGCD(int a, int b) {
        while (b != 0) {
            int temp = b;
            b = a % b;
            a = temp;
        }
        return a;
    }
}
```

Output:

```
Enter the first number:
5
Enter the second number:
6
The GCD of 5 and 6 is: 1
```

2. Write a java program to LCM of TWO given number.

```
package Assig1;
import java.util.Scanner;

public class Q2{
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.println("Enter the first number:");
        int number1 = scanner.nextInt();

        System.out.println("Enter the second number:");
        int number2 = scanner.nextInt();

        int lcm = findLCM(number1, number2);
        System.out.println("The LCM of " + number1 + " and " + number2 + "
is: " + lcm);

        scanner.close();
    }

    public static int findLCM(int a, int b) {

        return (a * b) / findGCD(a, b);
    }

    public static int findGCD(int a, int b) {
        while (b != 0) {
            int temp = b;
            b = a % b;
            a = temp;
        }
        return a;
    }
}
```

Output:

```
Enter the first number:
56
Enter the second number:
48
The LCM of 56 and 48 is: 336
```

3. Write a Java Program to print all the Prime Factors of the Given Number.

```
package Assig1;
import java.util.Scanner;

public class Q3 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

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

        System.out.println("Prime factors of " + number + " are:");
        printPrimeFactors(number);

        scanner.close();
    }

    public static void printPrimeFactors(int n) {

        while (n % 2 == 0) {
            System.out.print(2 + " ");
            n /= 2;
        }

        for (int i = 3; i * i <= n; i += 2) {

            while (n % i == 0) {
                System.out.print(i + " ");
                n /= i;
            }
        }

        if (n > 2) {
            System.out.print(n);
        }
    }
}
```

Output:

```
Enter a number:26
Prime factors of 26 are:2 13
```

4. Check whether the Given Number is a Palindrome or NOT.

```
5. package Assig1;
6. import java.util.Scanner;
7.
8. public class Q4 {
9.     public static void main(String[] args) {
10.         Scanner scanner = new Scanner(System.in);
11.
12.         System.out.println("Enter a number:");
13.         int number = scanner.nextInt();
14.
15.         if (isPalindrome(number)) {
16.             System.out.println(number + " is a palindrome.");
17.         } else {
18.             System.out.println(number + " is not a
19. palindrome.");
20.         }
21.         scanner.close();
22.     }
23.
24.     public static boolean isPalindrome(int n) {
25.         int originalNumber = n;
26.         int reversedNumber = 0;
27.
28.         while (n != 0) {
29.             int digit = n % 10;
30.             reversedNumber = reversedNumber * 10 + digit;
31.             n /= 10;
32.         }
33.
34.         return originalNumber == reversedNumber;
35.     }
36. }
37.
```

Output:

```
Enter a number:151
151 is a palindrome.
```

5. Write a Java Program to check whether the Given Number is Prime Number or NOT.

```
package Assig1;
import java.util.Scanner;

public class Q5 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

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

        if (isPrime(number)) {
            System.out.println(number + " is a prime number.");
        } else {
            System.out.println(number + " is not a prime number.");
        }

        scanner.close();
    }

    public static boolean isPrime(int n) {
        if (n <= 1) {
            return false;
        }

        for (int i = 2; i <= Math.sqrt(n); i++) {
            if (n % i == 0) {
                return false;
            }
        }

        return true;
    }
}
```

Output:

```
Enter a number:5
5 is a prime number.
```

6. Write a Java Program to check whether the given number is Armstrong Number or NOT.

```
package Assig1;
import java.util.Scanner;

public class Q6{
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

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

        if (isArmstrongNumber(number)) {
            System.out.println(number + " is an Armstrong number.");
        } else {
            System.out.println(number + " is not an Armstrong number.");
        }

        scanner.close();
    }

    public static boolean isArmstrongNumber(int n) {
        int originalNumber = n;
        int sum = 0;
        int numberOfDigits = countDigits(n);

        while (n > 0) {
            int digit = n % 10;
            sum += Math.pow(digit, numberOfDigits);
            n /= 10;
        }

        return originalNumber == sum;
    }

    public static int countDigits(int n) {
        int count = 0;
        while (n > 0) {
            count++;
            n /= 10;
        }
        return count;
    }
}
```

Output:

```
Enter a number:407
407 is an Armstrong number.
```

7. Write a Java Program to check whether the given number is Perfect Number or NOT.

```
package Assig1;
import java.util.Scanner;

public class Q7 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

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

        if (isPerfectNumber(number)) {
            System.out.println(number + " is a perfect number.");
        } else {
            System.out.println(number + " is not a perfect number.");
        }

        scanner.close();
    }

    public static boolean isPerfectNumber(int n) {
        int sum = 0;

        for (int i = 1; i <= n / 2; i++) {
            if (n % i == 0) {
                sum += i;
            }
        }

        return sum == n;
    }
}
```

Output: Enter a number:

10
10 is not a perfect number.

8. Write a Java Program to check whether the given numbers are Amicable Numbers or NOT.

```
package Assig1;
import java.util.Scanner;

public class Q8 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.println("Enter the first number:");
        int number1 = scanner.nextInt();

        System.out.println("Enter the second number:");
        int number2 = scanner.nextInt();

        if (areAmicableNumbers(number1, number2)) {
            System.out.println(number1 + " and " + number2 + " are Amicable numbers.");
        } else {
            System.out.println(number1 + " and " + number2 + " are not Amicable numbers.");
        }

        scanner.close();
    }

    public static boolean areAmicableNumbers(int num1, int num2) {
        return (sumOfProperDivisors(num1) == num2) &&
            (sumOfProperDivisors(num2) == num1);
    }

    public static int sumOfProperDivisors(int n) {
        int sum = 1;

        for (int i = 2; i <= Math.sqrt(n); i++) {
            if (n % i == 0) {
                sum += i;
                if (i != n / i) {
                    sum += n / i;
                }
            }
        }

        return sum;
    }
}
```

Output:Enter the first number:

```
220
Enter the second number:
284
220 and 284 are Amicable numbers.
```

Note: a pair of integer in which each is the sum of the divisor of other.

9. Write a Java Program to check whether the given number is Ramanujam's Number or NOT.

```
package Assig1;
import java.util.Scanner;
// 1729
public class Q9{
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

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

        if (isRamanujanNumber(number)) {
            System.out.println(number + " is a Ramanujan number.");
        } else {
            System.out.println(number + " is not a Ramanujan number.");
        }

        scanner.close();
    }

    public static boolean isRamanujanNumber(int n) {
        int count = 0;

        for (int i = 1; i * i * i < n; i++) {
            for (int j = i + 1; i * i * i + j * j * j <= n; j++) {
                if (i * i * i + j * j * j == n) {
                    count++;
                }
            }
        }

        return count >= 2;
    }
}
```

Output:

```
Enter a number:
1729
1729 is a Ramanujan number.
```

10. Write a Java Program check whether the given number is Automorphic Number or NOT.

```
package Assig1;
import java.util.Scanner;

public class Q10 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

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

        if (isAutomorphicNumber(number)) {
            System.out.println(number + " is an Automorphic number.");
        } else {
            System.out.println(number + " is not an Automorphic number.");
        }

        scanner.close();
    }

    public static boolean isAutomorphicNumber(int n) {
        int square = n * n;

        while (n > 0) {
            if (n % 10 != square % 10) {
                return false;
            }
            n /= 10;
            square /= 10;
        }

        return true;
    }
}
```

Output:

```
Enter a number:
625
625 is an Automorphic number.
```