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

1. **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

1. **Write a Java Program to print all the Prime Factorsof 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

1. **Check whether the Given Numberis a Palindrome or NOT.**
2. **package** Assig1;
3. **import** java.util.Scanner;
4. **public** **class** Q4 {
5. **public** **static** **void** main(String[] args) {
6. Scanner scanner = **new** Scanner(System.***in***);
8. System.***out***.println("Enter a number:");
9. **int** number = scanner.nextInt();
11. **if** (*isPalindrome*(number)) {
12. System.***out***.println(number + " is a palindrome.");
13. } **else** {
14. System.***out***.println(number + " is not a palindrome.");
15. }
17. scanner.close();
18. }

21. **public** **static** **boolean** isPalindrome(**int** n) {
22. **int** originalNumber = n;
23. **int** reversedNumber = 0;
25. **while** (n != 0) {
26. **int** digit = n % 10;
27. reversedNumber = reversedNumber \* 10 + digit;
28. n /= 10;
29. }
31. **return** originalNumber == reversedNumber;
32. }
33. }

**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 Numberor 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 Numberor 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 Numbersor 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 Numberor 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 Numberor 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.