**1) No Parameter & No Return Value**

**Program 1**

import java.util.Scanner;

public class Main {

static void add() {

int a, b, c;

Scanner sc = new Scanner(System.in);

System.out.println("Enter two numbers:");

a = sc.nextInt();

b = sc.nextInt();

c = a + b;

System.out.println("Addition = " + c);

}

static void max() {

int a, b, c;

Scanner sc = new Scanner(System.in);

System.out.println("Enter two numbers:");

a = sc.nextInt();

b = sc.nextInt();

c = (a > b) ? a : b;

System.out.println("Max = " + c);

}

static void power() {

int a, b, c = 1;

Scanner sc = new Scanner(System.in);

System.out.println("Enter two numbers:");

a = sc.nextInt();

b = sc.nextInt();

for (int i = 1; i <= b; i++) {

c = c \* a;

}

System.out.println("Power = " + c);

}

public static void main(String[] args) {

add();

max();

power();

}

}

**Output:**

Enter two numbers:

3 5

Addition = 8

Enter two numbers:

7 4

Max = 7

Enter two numbers:

2 3

Power = 8

**Program 2**

import java.util.Scanner;

public class Main {

static void multiply() {

int a, b, c;

Scanner sc = new Scanner(System.in);

System.out.println("Enter two numbers:");

a = sc.nextInt();

b = sc.nextInt();

c = a \* b;

System.out.println("Multiplication = " + c);

}

static void min() {

int a, b, c;

Scanner sc = new Scanner(System.in);

System.out.println("Enter two numbers:");

a = sc.nextInt();

b = sc.nextInt();

c = (a < b) ? a : b;

System.out.println("Min = " + c);

}

static void square() {

int a, b;

Scanner sc = new Scanner(System.in);

System.out.println("Enter a number:");

a = sc.nextInt();

b = a \* a;

System.out.println("Square = " + b);

}

public static void main(String[] args) {

multiply();

min();

square();

}

}

**Output:**

Enter two numbers:

4 6

Multiplication = 24

Enter two numbers:

8 3

Min = 3

Enter a number:

5

Square = 25

**Program 3:**

import java.util.Scanner;

public class Main {

static void divide() {

int a, b;

Scanner sc = new Scanner(System.in);

System.out.println("Enter two numbers:");

a = sc.nextInt();

b = sc.nextInt();

if (b != 0) {

double c = (double) a / b;

System.out.println("Division = " + c);

} else {

System.out.println("Cannot divide by zero");

}

}

static void modulus() {

int a, b;

Scanner sc = new Scanner(System.in);

System.out.println("Enter two numbers:");

a = sc.nextInt();

b = sc.nextInt();

int c = a % b;

System.out.println("Modulus = " + c);

}

static void cube() {

int a;

Scanner sc = new Scanner(System.in);

System.out.println("Enter a number:");

a = sc.nextInt();

int b = a \* a \* a;

System.out.println("Cube = " + b);

}

public static void main(String[] args) {

divide();

modulus();

cube();

}

}

**Output:**

Enter two numbers:

9 3

Division = 3.0

Enter two numbers:

10 3

Modulus = 1

Enter a number:

4

Cube = 64

**Program 4:**

import java.util.Scanner;

public class Main {

static void sumOfDigits() {

int n, sum = 0;

Scanner sc = new Scanner(System.in);

System.out.println("Enter a number:");

n = sc.nextInt();

while (n != 0) {

sum += n % 10;

n /= 10;

}

System.out.println("Sum of digits = " + sum);

}

static void reverseNumber() {

int n, reverse = 0;

Scanner sc = new Scanner(System.in);

System.out.println("Enter a number:");

n = sc.nextInt();

while (n != 0) {

reverse = reverse \* 10 + n % 10;

n /= 10;

}

System.out.println("Reverse = " + reverse);

}

static void isEven() {

int n;

Scanner sc = new Scanner(System.in);

System.out.println("Enter a number:");

n = sc.nextInt();

if (n % 2 == 0) {

System.out.println("Number is even");

} else {

System.out.println("Number is odd");

}

}

public static void main(String[] args) {

sumOfDigits();

reverseNumber();

isEven();

}

}

**Output:**

Enter a number:

12345

Sum of digits = 15

Enter a number:

12345

Reverse = 54321

Enter a number:

4

Number is even

**Program 5:**

import java.util.Scanner;

public class Main {

static void isPrime() {

int n, i, flag = 0;

Scanner sc = new Scanner(System.in);

System.out.println("Enter a number:");

n = sc.nextInt();

for (i = 2; i <= n / 2; ++i) {

if (n % i == 0) {

flag = 1;

break;

}

}

if (n == 1) {

System.out.println("1 is neither prime nor composite.");

} else {

if (flag == 0)

System.out.println(n + " is a prime number.");

else

System.out.println(n + " is not a prime number.");

}

}

static void fibonacci() {

int n, t1 = 0, t2 = 1;

Scanner sc = new Scanner(System.in);

System.out.println("Enter the number of terms:");

n = sc.nextInt();

System.out.println("First " + n + " terms of Fibonacci series: ");

for (int i = 1; i <= n; ++i) {

System.out.print(t1 + " + ");

int sum = t1 + t2;

t1 = t2;

t2 = sum;

}

}

static void factorial() {

int n;

long fact = 1;

Scanner sc = new Scanner(System.in);

System.out.println("Enter a number:");

n = sc.nextInt();

for (int i = 1; i <= n; ++i) {

fact \*= i;

}

System.out.println("Factorial = " + fact);

}

public static void main(String[] args) {

isPrime();

fibonacci();

factorial();

}

}

**Output:**

Enter a number:

7

7 is a prime number.

Enter the number of terms:

5

First 5 terms of Fibonacci series:

0 + 1 + 1 + 2 + 3 +

Enter a number:

5

Factorial = 120

**2) No Parameter with Return Value**

**Program A:**

import java.util.Scanner;

public class Main {

static int add() {

int a, b, c;

Scanner sc = new Scanner(System.in);

System.out.println("Enter two numbers:");

a = sc.nextInt();

b = sc.nextInt();

c = a + b;

return c;

}

public static void main(String[] args) {

int result = add();

System.out.println("Addition = " + result);

}

}

**Output:**

Enter two numbers:

3 4

Addition = 7

**Program B:**

import java.util.Scanner;

public class Main {

static int fact() {

int n, f1 = 1;

Scanner sc = new Scanner(System.in);

System.out.println("Enter a number:");

n = sc.nextInt();

for (int i = n; i > 1; i--) {

f1 = f1 \* i;

}

return f1;

}

public static void main(String[] args) {

int result = fact();

System.out.println("Factorial = " + result);

}

}

**Output:**

Enter a number:

5

Factorial = 120

**Program C:**

import java.util.Scanner;

public class Main {

static String prime() {

int n, div = 0;

Scanner sc = new Scanner

(System.in);

System.out.println("Enter a number:");

n = sc.nextInt();

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

if (n % i == 0) {

div = 1;

break;

}

}

if (div == 0)

return "Number is prime";

else

return "Number is not prime";

}

public static void main(String[] args) {

String result = prime();

System.out.println(result);

}

}

**Output:**

Enter a number:

11

Number is prime

**Program D:**

import java.util.Scanner;

public class Main {

static int power() {

int a, b, result = 1;

Scanner sc = new Scanner(System.in);

System.out.println("Enter two numbers:");

a = sc.nextInt();

b = sc.nextInt();

for (int i = 1; i <= b; i++) {

result = result \* a;

}

return result;

}

public static void main(String[] args) {

int result = power();

System.out.println("Power = " + result);

}

}

**Output:**

Enter two numbers:

2 3

Power = 8

**3) With Parameter & No Return Value**

**Program A:**

import java.util.Scanner;

public class Main {

static void add(int a, int b) {

int c = a + b;

System.out.println("Addition = " + c);

}

public static void main(String[] args) {

int a, b;

Scanner sc = new Scanner(System.in);

System.out.println("Enter two numbers:");

a = sc.nextInt();

b = sc.nextInt();

add(a, b);

}

}

**Output:**

Enter two numbers:

4 5

Addition = 9

**Program B:**

import java.util.Scanner;

public class Main {

static void fact(int a) {

int f1 = 1;

for (int i = a; i > 1; i--) {

f1 = f1 \* i;

}

System.out.println("Factorial = " + f1);

}

public static void main(String[] args) {

int a;

Scanner sc = new Scanner(System.in);

System.out.println("Enter a number:");

a = sc.nextInt();

fact(a);

}

}

**Output:**

Enter a number:

5

Factorial = 120

**Program C:**

import java.util.Scanner;

public class Main {

static void PE(double m, double g, double h) {

double pe = m \* g \* h;

System.out.println("Potential Energy = " + pe);

}

public static void main(String[] args) {

double m, g, h;

Scanner sc = new Scanner(System.in);

System.out.println("Enter mass (m), gravity (g), and height (h):");

m = sc.nextDouble();

g = sc.nextDouble();

h = sc.nextDouble();

PE(m, g, h);

}

}

**Output:**

Enter mass (m), gravity (g), and height (h):

2.0 9.8 5.0

Potential Energy = 98.0

**4) With Parameter & With Return Value**

**Program A:**

import java.util.Scanner;

public class Main {

static double PE(double m, double g, double h) {

return m \* g \* h;

}

public static void main(String[] args) {

double m, g, h, pe;

Scanner sc = new Scanner(System.in);

System.out.println("Enter mass (m), gravity (g), and height (h):");

m = sc.nextDouble();

g = sc.nextDouble();

h = sc.nextDouble();

pe = PE(m, g, h);

System.out.println("Potential Energy = " + pe);

}

}

**Output:**

Enter mass (m), gravity (g), and height (h):

3.0 9.8 10.0

Potential Energy = 294.0

**Program B:**

import java.util.Scanner;

public class Main {

static int fact(int a) {

int f1 = 1;

for (int i = a; i > 1; i--) {

f1 = f1 \* i;

}

return f1;

}

public static void main(String[] args) {

int a, f1;

Scanner sc = new Scanner(System.in);

System.out.println("Enter a number:");

a = sc.nextInt();

f1 = fact(a);

System.out.println("Factorial = " + f1);

}

}

**Output:**

Enter a number:

6

Factorial = 720

**Programs with Multiple Methods of Different Types**

**Program 1:**

import java.util.Scanner;

public class Main {

static void sub1() {

int a, b, c;

Scanner sc = new Scanner(System.in);

System.out.println("Enter two numbers:");

a = sc.nextInt();

b = sc.nextInt();

c = a - b;

System.out.println("Subtraction = " + c);

}

static int sub2() {

int a, b, c;

Scanner sc = new Scanner(System.in);

System.out.println("Enter two numbers:");

a = sc.nextInt();

b = sc.nextInt();

c = a - b;

return c;

}

static void sub3(int a, int b) {  
 int c = a - b;

System.out.println("Subtraction = " + c);

}

static int sub4(int a, int b) {

return a - b;

}

public static void main(String[] args) {

int a, b;

sub1();

int c = sub2();

System.out.println("Subtraction = " + c);

Scanner sc = new Scanner(System.in);

System.out.println("Enter two numbers:");

a = sc.nextInt();

b = sc.nextInt();

sub3(a, b);

c = sub4(a, b);

System.out.println("Subtraction = " + c);

}

}

**Output:**

Enter two numbers:

10 5

Subtraction = 5

Enter two numbers:

20 10

Subtraction = 10

Enter two numbers:

15 10

Subtraction = 5

Subtraction = 5

**Program 2:**

import java.util.Scanner;

public class Main {

static void sum1() {

int a, b, c;

Scanner sc = new Scanner(System.in);

System.out.println("Enter two numbers:");

a = sc.nextInt();

b = sc.nextInt();

c = a + b;

System.out.println("Sum = " + c);

}

static int sum2() {

int a, b, c;

Scanner sc = new Scanner(System.in);

System.out.println("Enter two numbers:");

a = sc.nextInt();

b = sc.nextInt();

c = a + b;

return c;

}

static void sum3(int a, int b) {

int c = a + b;

System.out.println("Sum = " + c);

}

static int sum4(int a, int b) {

return a + b;

}

public static void main(String[] args) {

int a, b;

sum1();

int c = sum2();

System.out.println("Sum = " + c);

Scanner sc = new Scanner(System.in);

System.out.println("Enter two numbers:");

a = sc.nextInt();

b = sc.nextInt();

sum3(a, b);

c = sum4(a, b);

System.out.println("Sum = " + c);

}

}

**Output:**

Enter two numbers:

4 5

Sum = 9

Enter two numbers:

6 7

Sum = 13

Enter two numbers:

8 9

Sum = 17

Sum = 17

**Program 3:**

import java.util.Scanner;

public class Main {

static void prime1() {

int n, i, flag = 0;

Scanner sc = new Scanner(System.in);

System.out.println("Enter a number:");

n = sc.nextInt();

for (i = 2; i <= n / 2; ++i) {

if (n % i == 0) {

flag = 1;

break;

}

}

if (n == 1) {

System.out.println("1 is neither prime nor composite.");

} else {

if (flag == 0)

System.out.println(n + " is a prime number.");

else

System.out

.println(n + " is not a prime number.");

}

}

static String prime2() { int n, i, flag = 0;

Scanner sc = new Scanner(System.in);

System.out.println("Enter a number:");

n = sc.nextInt();

for (i = 2; i <= n / 2; ++i) {

if (n % i == 0) {

flag = 1;

break;

}

}

if (n == 1) {

return "1 is neither prime nor composite.";

} else {

if (flag == 0)

return n + " is a prime number.";

else

return n + " is not a prime number.";

}

}

static void prime3(int n) { int i, flag = 0;

for (i = 2; i <= n / 2; ++i) {

if (n % i == 0) {

flag = 1;

break;

}

}

if (n == 1) {

System.out.println("1 is neither prime nor composite.");

} else {

if (flag == 0)

System.out.println(n + " is a prime number.");

else

System.out.println(n + " is not a prime number.");

}

}

static String prime4(int n) {

int i, flag = 0;

for (i = 2; i <= n / 2; ++i) {

if (n % i == 0) {

flag = 1;

break;

}

}

if (n == 1) {

return "1 is neither prime nor composite.";

} else {

if (flag == 0)

return n + " is a prime number.";

else

return n + " is not a prime number.";

}

}

public static void main(String[] args) {

prime1();

String result = prime2();

System.out.println(result);

Scanner sc = new Scanner(System.in);

System.out.println("Enter a number:");

int n = sc.nextInt();

prime3(n);

result = prime4(n);

System.out.println(result);

}

}

**Output:**

Enter a number:

7

7 is a prime number.

Enter a number:

11

11 is a prime number.

Enter a number:

13

13 is a prime number.

13 is a prime number.