1. Program 1

package org.example;  
  
// Program to demonstrate School class with constructor and method  
  
class School {  
 String name; // instance variable  
  
 // Default constructor  
 School() {  
 name = "ABC Public School"; // assigning default value  
 System.*out*.println("School Name: " + name);  
 }  
  
 // Method to display message  
 void displayLocation() {  
 System.*out*.println("This School is based out of Kolkata");  
 }  
  
 // main method  
 public static void main(String[] args) {  
 School school = new School(); // calling default constructor  
 school.displayLocation(); // calling method  
 }  
}

1. Program 2

package org.example;  
  
public class School\_ {  
 String name;  
 String address;  
 int strength;  
  
 // Constructor with 2 parameters  
 School\_(String name, String address) {  
 this.name = name;  
 this.address = address;  
 }  
  
 // Constructor with 3 parameters  
 School\_(String name, String address, int strength) {  
 this.name = name;  
 this.address = address;  
 this.strength = strength;  
 }  
  
 // Method to display details  
 void displayDetails() {  
 System.*out*.println("School Name: " + name);  
 System.*out*.println("Address: " + address);  
 System.*out*.println("Strength: " + strength);  
 System.*out*.println("--------------------------------");  
 }  
  
 // main method  
 public static void main(String[] args) {  
 // Object using constructor with 2 parameters  
 School\_ school1 = new School\_("ABC Public School", "Kolkata");  
 school1.displayDetails();  
  
 // Object using constructor with 3 parameters  
 School\_ school2 = new School\_("XYZ International School", "Delhi", 1200);  
 school2.displayDetails();  
 }  
}

1. Program 3

package org.example;  
  
// Program to check if a number is an Armstrong number  
  
import java.util.Scanner;  
  
class ArmstrongNumber {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
  
 System.*out*.print("Enter a number: ");  
 int num = sc.nextInt();  
  
 int originalNum = num;  
 int result = 0;  
 int digits = 0;  
  
 // count number of digits  
 int temp = num;  
 while (temp != 0) {  
 temp /= 10;  
 digits++;  
 }  
  
 // calculate sum of power of digits  
 temp = num;  
 while (temp != 0) {  
 int remainder = temp % 10;  
 result += Math.*pow*(remainder, digits);  
 temp /= 10;  
 }  
  
 // check Armstrong condition  
 if (result == originalNum)  
 System.*out*.println(originalNum + " is an Armstrong number.");  
 else  
 System.*out*.println(originalNum + " is not an Armstrong number.");  
 }  
}

1. Program 4

package org.example;  
  
// Program to find the maximum among 5 numbers  
  
import java.util.Scanner;  
  
class greatestNumber {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
  
 int[] numbers = new int[5];  
  
 System.*out*.println("Enter 5 numbers:");  
 for (int i = 0; i < 5; i++) {  
 numbers[i] = sc.nextInt();  
 }  
  
 int max = numbers[0];  
  
 for (int i = 1; i < 5; i++) {  
 if (numbers[i] > max) {  
 max = numbers[i];  
 }  
 }  
  
 System.*out*.println("The maximum number is: " + max);  
 }  
}

1. Program 5

package org.example;  
  
// Program to find factorial of a number  
  
import java.util.Scanner;  
  
class Factorial {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
  
 System.*out*.print("Enter a number: ");  
 int num = sc.nextInt();  
  
 long fact = 1;  
  
 for (int i = 1; i <= num; i++) {  
 fact = fact \* i;  
 }  
  
 System.*out*.println("Factorial of " + num + " is: " + fact);  
 }  
}

1. Program 6

package org.example;  
  
// Program to check if a number is prime or not  
  
import java.util.Scanner;  
  
class PrimeNumber {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
  
 System.*out*.print("Enter a number: ");  
 int num = sc.nextInt();  
  
 boolean isPrime = true;  
  
 // 0 and 1 are not prime numbers  
 if (num <= 1) {  
 isPrime = false;  
 } else {  
 for (int i = 2; i <= num / 2; i++) {  
 if (num % i == 0) {  
 isPrime = false;  
 break;  
 }  
 }  
 }  
  
 if (isPrime)  
 System.*out*.println(num + " is a Prime number.");  
 else  
 System.*out*.println(num + " is not a Prime number.");  
 }  
}

1. Program 7

package org.example;  
  
// Car class  
class Car {  
 private String brand;  
  
 // Constructor that initializes brand to "Ford"  
 Car() {  
 brand = "Ford";  
 }  
  
 // Getter method to return brand  
 public String getBrand() {  
 return brand;  
 }  
}  
  
// Sample class with main method  
class Sample {  
 public static void main(String[] args) {  
 Car myCar = new Car(); // calling constructor  
 String carBrand = myCar.getBrand(); // storing brand value  
 System.*out*.println("Car Brand: " + carBrand);  
 }  
}

Program 8

package org.example;  
  
// Program to calculate area of Square, Rectangle and Circle using a single class  
  
class Shape {  
 double length; // instance variable  
  
 // Method to find area of square  
 void square(double side) {  
 double area = side \* side;  
 System.*out*.println("Area of Square: " + area);  
 }  
  
 // Method to find area of rectangle  
 void rectangle(double length, double breadth) {  
 double area = length \* breadth;  
 System.*out*.println("Area of Rectangle: " + area);  
 }  
  
 // Method to find area of circle  
 void circle(double radius) {  
 double area = Math.*PI* \* radius \* radius;  
 System.*out*.println("Area of Circle: " + area);  
 }  
  
 public static void main(String[] args) {  
 Shape shape = new Shape(); // object creation  
  
 // calling different methods  
 shape.square(5);  
 shape.rectangle(4, 6);  
 shape.circle(3);  
 }  
}

Program 9

package org.example;  
  
// Program to print a diamond pattern  
  
import java.util.Scanner;  
  
class DiamondPattern {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
  
 System.*out*.print("Enter the number of rows for the diamond (half): ");  
 int n = sc.nextInt();  
  
 // Upper half of diamond  
 for (int i = 1; i <= n; i++) {  
 // Print spaces  
 for (int j = i; j < n; j++) {  
 System.*out*.print(" ");  
 }  
 // Print stars  
 for (int j = 1; j <= (2 \* i - 1); j++) {  
 System.*out*.print("\*");  
 }  
 System.*out*.println();  
 }  
  
 // Lower half of diamond  
 for (int i = n - 1; i >= 1; i--) {  
 // Print spaces  
 for (int j = n; j > i; j--) {  
 System.*out*.print(" ");  
 }  
 // Print stars  
 for (int j = 1; j <= (2 \* i - 1); j++) {  
 System.*out*.print("\*");  
 }  
 System.*out*.println();  
 }  
 }  
}

Program 10

package org.example;  
  
// Program to reverse a number and check if it is palindrome  
  
import java.util.Scanner;  
  
class PalindromeNumber {  
 public static void main(String[] args) {  
 Scanner sc = new Scanner(System.*in*);  
  
 System.*out*.print("Enter a number: ");  
 int num = sc.nextInt();  
  
 int originalNum = num;  
 int reversedNum = 0;  
  
 // Reverse the number  
 while (num != 0) {  
 int digit = num % 10;  
 reversedNum = reversedNum \* 10 + digit;  
 num = num / 10;  
 }  
  
 System.*out*.println("Reversed Number: " + reversedNum);  
  
 // Check for palindrome  
 if (originalNum == reversedNum) {  
 System.*out*.println(originalNum + " is a Palindrome number.");  
 } else {  
 System.*out*.println(originalNum + " is not a Palindrome number.");  
 }  
 }  
}