**Object-Oriented Implementation with Inheritance and Independent Execution in Java**

public class **Person\_Class** {

String name;

int age;

// Constructor

public Person\_Class(String name, int age) {

this.name = name;

this.age = age;

}

// Method to display info

public void displayInfo() {

System.out.println("Name: " + name + ", Age: " + age);

}

// Main method to run Person\_Class independently

public static void main(String[] args) {

// Creating an object and displaying information

Person\_Class person = new Person\_Class("Alice", 25);

person.displayInfo();

}

}

public class **Student\_Class** extends Person\_Class {

String studentID;

// Constructor using super()

public Student\_Class(String name, int age, String studentID) {

super(name, age);

this.studentID = studentID;

}

// Method to display student details

public void displayStudent() {

System.out.println("Student ID: " + studentID);

displayInfo(); // Calling the superclass method

}

// Main method to make this class runnable independently

public static void main(String[] args) {

// Creating a Student object

Student\_Class student = new Student\_Class("Bob", 20, "S12345");

// Displaying student details

student.displayStudent();

}

}

public class **Main\_Objects** {

public static void main(String[] args) {

// Creating a Person object

Person\_Class p1 = new Person\_Class("Alice", 35);

p1.displayInfo();

// Creating a Student object

Student\_Class s1 = new Student\_Class("Bob", 20, "S12345");

s1.displayStudent();

}

}

**Enhanced Java Program Demonstrating Inheritance, Independent Execution, and Additional Attributes**

public class **Person\_Class** {

String name;

int age;

String nationality; // Newly added variable

// Constructor

public Person\_Class(String name, int age, String nationality) {

this.name = name;

this.age = age;

this.nationality = nationality;

}

// Method to display person information

public void displayInfo() {

System.out.println("Name: " + name + ", Age: " + age + ", Nationality: " + nationality);

}

// Main method to run independently

public static void main(String[] args) {

// Creating an instance of Person\_Class

Person\_Class person = new Person\_Class("Alice", 35, "USA");

person.displayInfo();

}

}

public class **Student\_Class** extends Person\_Class {

String studentID;

// Constructor

public Student\_Class(String name, int age, String nationality, String studentID) {

super(name, age, nationality);

this.studentID = studentID;

}

// Method to display student details

public void displayStudent() {

System.out.println("Student ID: " + studentID);

displayInfo();

}

// Method to check if the student is a minor (age < 18)

public boolean isMinor() {

return age < 18;

}

// Main method to test the Student\_Class independently

public static void main(String[] args) {

// Creating an instance of Student\_Class

Student\_Class student = new Student\_Class("Bob", 16, "USA", "S12345");

// Displaying student details

student.displayStudent();

// Checking if the student is a minor

System.out.println("Is Minor: " + student.isMinor());

}

}

public class **Teacher\_Class** extends Person\_Class {

String subject;

// Constructor

public Teacher\_Class(String name, int age, String nationality, String subject) {

super(name, age, nationality);

this.subject = subject;

}

// Method to display teacher details

public void displayTeacher() {

System.out.println("Teacher of: " + subject);

displayInfo();

}

// Main method to test Teacher\_Class independently

public static void main(String[] args) {

// Creating an instance of Teacher\_Class

Teacher\_Class teacher = new Teacher\_Class("Alice", 40, "UK", "Mathematics");

// Displaying teacher details

teacher.displayTeacher();

}

}

public class **Main\_Objects** {

public static void main(String[] args) {

// Creating a Person object

Person\_Class person = new Person\_Class("Alice", 35, "USA");

person.displayInfo();

// Creating a Student object

Student\_Class student = new Student\_Class("Bob", 20, "USA", "S12345");

student.displayStudent();

System.out.println("Is Minor: " + student.isMinor());

// Creating a Teacher object

Teacher\_Class teacher = new Teacher\_Class("Mr. Johnson", 45, "UK", "Mathematics");

teacher.displayTeacher();

}

}

**Enhanced Java Program with User Input, Inheritance, and Dynamic Object Creation**

**How These Versions Work:**

✅ **Loops until the user enters 0 for age.**  
✅ **Takes user input dynamically** for each class.  
✅ **Main\_Objects allows users to choose whether to enter Person, Student, or Teacher data.**  
✅ **Properly handles user input with Scanner** to avoid input mismatches.

import java.util.Scanner; // Import Scanner for user input

public class Person\_Class {

String name;

int age;

String nationality;

// Constructor

public Person\_Class(String name, int age, String nationality) {

this.name = name;

this.age = age;

this.nationality = nationality;

}

// Method to display person information

public void displayInfo() {

System.out.println("Name: " + name + ", Age: " + age + ", Nationality: " + nationality);

}

// Main method to take user input

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

while (true) {

// Asking for user input

System.out.print("Enter Name: ");

String name = scanner.nextLine();

System.out.print("Enter Age (Enter 0 to stop): ");

int age = scanner.nextInt();

scanner.nextLine(); // Consume newline character

// Condition to break the loop

if (age == 0) {

System.out.println("Exiting...");

break;

}

System.out.print("Enter Nationality: ");

String nationality = scanner.nextLine();

// Creating a Person object

Person\_Class person = new Person\_Class(name, age, nationality);

person.displayInfo();

}

scanner.close();

}

}

import java.util.Scanner; // Import Scanner for user input

public class Student\_Class extends Person\_Class {

String studentID;

// Constructor

public Student\_Class(String name, int age, String nationality, String studentID) {

super(name, age, nationality);

this.studentID = studentID;

}

// Method to display student details

public void displayStudent() {

System.out.println("Student ID: " + studentID);

displayInfo();

}

// Method to check if the student is a minor

public boolean isMinor() {

return age < 18;

}

// Main method to take user input

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

while (true) {

// Asking for user input

System.out.print("Enter Name: ");

String name = scanner.nextLine();

System.out.print("Enter Age (Enter 0 to stop): ");

int age = scanner.nextInt();

scanner.nextLine(); // Consume newline character

if (age == 0) {

System.out.println("Exiting...");

break;

}

System.out.print("Enter Nationality: ");

String nationality = scanner.nextLine();

System.out.print("Enter Student ID: ");

String studentID = scanner.nextLine();

// Creating a Student object

Student\_Class student = new Student\_Class(name, age, nationality, studentID);

student.displayStudent();

System.out.println("Is Minor: " + student.isMinor());

}

scanner.close();

}

}

import java.util.Scanner; // Import Scanner for user input

public class Teacher\_Class extends Person\_Class {

String subject;

// Constructor

public Teacher\_Class(String name, int age, String nationality, String subject) {

super(name, age, nationality);

this.subject = subject;

}

// Method to display teacher details

public void displayTeacher() {

System.out.println("Teacher of: " + subject);

displayInfo();

}

// Main method to take user input

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

while (true) {

// Asking for user input

System.out.print("Enter Name: ");

String name = scanner.nextLine();

System.out.print("Enter Age (Enter 0 to stop): ");

int age = scanner.nextInt();

scanner.nextLine(); // Consume newline character

if (age == 0) {

System.out.println("Exiting...");

break;

}

System.out.print("Enter Nationality: ");

String nationality = scanner.nextLine();

System.out.print("Enter Subject: ");

String subject = scanner.nextLine();

// Creating a Teacher object

Teacher\_Class teacher = new Teacher\_Class(name, age, nationality, subject);

teacher.displayTeacher();

}

scanner.close();

}

}

import java.util.Scanner; // Import Scanner for user input

public class Main\_Objects {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

while (true) {

System.out.println("\nSelect an option:");

System.out.println("1. Enter Person Data");

System.out.println("2. Enter Student Data");

System.out.println("3. Enter Teacher Data");

System.out.println("0. Exit");

System.out.print("Your choice: ");

int choice = scanner.nextInt();

scanner.nextLine(); // Consume newline character

if (choice == 0) {

System.out.println("Exiting program...");

break;

}

System.out.print("Enter Name: ");

String name = scanner.nextLine();

System.out.print("Enter Age (Enter 0 to stop): ");

int age = scanner.nextInt();

scanner.nextLine(); // Consume newline character

if (age == 0) {

System.out.println("Exiting input...");

continue;

}

System.out.print("Enter Nationality: ");

String nationality = scanner.nextLine();

if (choice == 1) {

// Creating a Person object

Person\_Class person = new Person\_Class(name, age, nationality);

person.displayInfo();

} else if (choice == 2) {

System.out.print("Enter Student ID: ");

String studentID = scanner.nextLine();

// Creating a Student object

Student\_Class student = new Student\_Class(name, age, nationality, studentID);

student.displayStudent();

System.out.println("Is Minor: " + student.isMinor());

} else if (choice == 3) {

System.out.print("Enter Subject: ");

String subject = scanner.nextLine();

// Creating a Teacher object

Teacher\_Class teacher = new Teacher\_Class(name, age, nationality, subject);

teacher.displayTeacher();

} else {

System.out.println("Invalid choice, please try again.");

}

}

scanner.close();

}

}