

# OOP Practice Problems with Expected Output

## 1. Student Class

Problem Statement:

Create a Student class for a school system.

- Instance variables: name, grade, rollNumber
- Static variable: totalStudents
- Instance methods: enroll(), promoteToNextGrade()
- Static method: getTotalStudents()

Expected Output Statements:

- "Ravi enrolled in 10th grade."
- "Ravi promoted to next grade."
- "Total students enrolled: 2"
- "Ravi is already enrolled."
- "Ravi is already in the highest grade."

## 2. Car Class

Problem Statement:

Design a Car class for a car rental service.

- Instance variables: make, model, registrationNumber, isRented
- Static variable: totalCars
- Instance methods: rentCar(), returnCar()
- Static method: getTotalCars()

Expected Output Statements:

- "Toyota Camry (MH12AB1234) has been rented."
- "Toyota Camry (MH12AB1234) has been returned."
- "Total cars in system: 2"
- "Car is already rented."
- "Car was not rented yet."

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## 3. Movie Class

Problem Statement:

Create a Movie class for a theater management system.

- Instance variables: title, genre, duration, availableSeats
- Static variable: totalMovies
- Instance methods: bookSeat(), cancelSeat()
- Static method: getTotalMovies()

Expected Output Statements:

- "Seat booked for Avengers. Seats left: 99"
- "Seat cancelled for Avengers. Seats left: 100"
- "Total movies showing: 1"
- "No seats available for booking."
- "All seats are already empty."

## 4. BankAccount Class

Problem Statement:

Create a BankAccount class for a banking system.

- Instance variables: accountHolder, accountNumber, balance
- Static variable: totalAccounts
- Instance methods: deposit(), withdraw()
- Static method: getTotalAccounts()

Expected Output Statements:

- "Deposited 1500. New Balance: 6500"
- "Withdrew 2000. Remaining Balance: 4500"
- "Total bank accounts: 1"
- "Insufficient balance. Withdrawal failed."
- "Deposit amount must be positive."

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## 5. Product Class

Problem Statement:

Design a Product class for an e-commerce platform.

- Instance variables: productName, productID, price, stockQuantity
- Static variable: totalProducts
- Instance methods: purchase(), restock()
- Static method: getTotalProducts()

Expected Output Statements:

- "Purchased Laptop. Stock left: 9"
- "Restocked 5 units. New stock: 14"
- "Total products listed: 1"
- "Out of stock. Cannot purchase."
- "Restock amount must be positive."

## 6. Flight Class

Problem Statement:

Implement a Flight class for an airline reservation system.

- Instance variables: flightNumber, origin, destination, seatsAvailable
- Static variable: totalFlights
- Instance methods: bookTicket(), cancelTicket()
- Static method: getTotalFlights()

Expected Output Statements:

- "Ticket booked on flight AI202. Seats left: 149"
- "Ticket canceled on flight AI202. Seats left: 150"
- "Total flights listed: 1"
- "No seats available on this flight."
- "All tickets already cancelled."

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## 7. User Class (Social Media)

Problem Statement:

Create a User class for a social networking site.

- Instance variables: username, email, followersCount
- Static variable: totalUsers
- Instance methods: followUser(), unfollowUser()
- Static method: getTotalUsers()

Expected Output Statements:

- "roshan followed deepa. Total followers of deepa: 51"
- "roshan unfollowed deepa. Total followers of deepa: 50"
- "Total users on platform: 2"
- "User already followed."
- "You are not following this user."

## 8. Game Class

Problem Statement:

Design a Game class for a game library application.

- Instance variables: name, genre, isMultiplayer
- Static variable: totalGames
- Instance methods: launchGame(), exitGame()
- Static method: getTotalGames()

Expected Output Statements:

- "Launching game: Minecraft"
- "Exiting game: Minecraft"
- "Total games available: 1"
- "Game is already running."
- "Game is not running currently."

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## 9. Course Class

Problem Statement:

Create a Course class for an online learning platform.

- Instance variables: courseName, instructor, enrolledStudents
- Static variable: totalCourses
- Instance methods: enrollStudent(), completeCourse()
- Static method: getTotalCourses()

Expected Output Statements:

- "Student enrolled in Java Programming."
- "Student completed Java Programming."
- "Total courses available: 1"
- "Student already enrolled."
- "Student has not enrolled yet."

## 10. LibraryUser Class

Problem Statement:

Build a LibraryUser class for a library system.

- Instance variables: name, userID, borrowedBooksCount
- Static variable: totalUsers
- Instance methods: borrowBook(), returnBook()
- Static method: getTotalUsers()

Expected Output Statements:

- "Ramesh borrowed a book. Total books borrowed: 1"
- "Ramesh returned a book. Total books borrowed: 0"
- "Total library users: 1"
- "Cannot borrow more than 5 books."
- "No books to return."