✅ Java Assignment – Class, Object & Arrays

Focus: Class definition, object creation, basic methods

1. **Create a `Student` class** with attributes `name` and `id`. Create one object and print its details.

2. **Define a `Book` class** with `title`, `author`, and `price`. Create an object using a constructor and display its data.

3. **Write a `Car` class** with attributes `brand` and `year`. Create two car objects and print their details.

4. **Create a `Rectangle` class** with attributes `length` and `width`. Add methods to calculate area and perimeter.

5. **Build a `Circle` class** with a method to calculate and return the area given the radius.

6. **Create a `Pen` class** with attributes `brand` and `color`. Create an object and print "Writing with a [color] [brand] pen."

7. **Create a class `Laptop`** with `model`, `RAM`, and `storage`. Use a constructor to set attributes and a method to display them.

8. **Create a class `Product`** and accept values from the user (using Scanner) to initialize attributes. Print them.

9. **Write a `Player` class** with `name` and `score`. Write a method to update the score and another to display it.

10. **Define a `MobilePhone` class** with methods to set and get details. Create multiple objects to test the methods.

Focus: Arrays of objects, conditionals, loops

11. **Create a class `Book`** and an array of 5 books. Initialize them with different titles and authors and print all.

12. **Create a `Product` class**. Store 4 product objects in an array and calculate the total price using a loop.

13. **Create a `Movie` class** with name and rating. In an array of movies, print the highest-rated one.

14. **Write a `Student` class** with attributes name and marks. Use an array to calculate and print average marks.

15. **Make a `Laptop` class** with brand, price, and RAM. Find the laptop with the most RAM in an array of laptops.

16. **Create a `Customer` class** with `purchaseAmount`. In an array, count how many spent over 1000.

17. **Write a `Room` class** with `number` and `capacity`. In an array, find and display rooms with capacity > 5.

18. **Create a `Teacher` class** and store 3 teachers in an array. Display those who teach “Mathematics”.

19. **Define a `City` class** and sort an array of cities by population (ascending).

20. **Create a `Circle` class** and store objects in an array. Display the one with the largest area.

Focus: Arrays of objects with operations, sorting, filtering, basic algorithm use

21. **Create a `Student` class** with `name` and 3 subject marks (as an array). Add a method to calculate grade and display it for 5 students.

22. **Write a class `BankAccount`** with `accountNumber`, `holderName`, and `balance`. Allow deposit and withdrawal. Perform transactions for 3 accounts stored in an array.

23. **Create a class `InventoryItem`** with `name`, `quantity`, and `price`. From an array of items, calculate total inventory value and list out-of-stock items.

24. **Make a `BusRoute` class** with route number, distance, and duration. Store routes in an array and sort them by shortest time.

25. **Write a `LibraryBook` class** with attributes: title, author, and borrowed (boolean). Print the list of available books from an array.

26. **Create a `GymMember` class** with name, membershipType, and expiryDate (as String). Display members with expired memberships based on today's date (input manually).

27. **Make a `Task` class** with taskName, dueDate, and status. From an array, display all pending tasks sorted by due date.

28. **Create a `Flight` class** with attributes: flightNo, destination, and fare. From an array of flights, display the cheapest flight to a specific destination (user input).

29. **Create a `WeatherReport` class** with city, temperature, and humidity. Store 5 reports and find the most humid city.

30. **Write a `SalesRecord` class** with product name, unitsSold, and unitPrice. Calculate the highest grossing product from an array of sales records.