

Programming Assignment: Object-Oriented Programming in Java

1. Create two threads using:

Implementing Runnable Interface

Extending Thread Class

Each thread should print numbers from 1 to 5 with a delay of 1 second between prints.

2. Write a Java program that demonstrates all the states of a thread lifecycle (NEW, RUNNABLE, BLOCKED, WAITING, TIMED_WAITING, and TERMINATED). Create a thread that goes through these states and print the state at different execution points using Thread.getState().
3. Write a Java program where three threads (HighPriorityThread, MediumPriorityThread, and LowPriorityThread) are created. Assign them Thread.MAX_PRIORITY, Thread.NORM_PRIORITY, and Thread.MIN_PRIORITY, respectively. Observe and explain the behavior of thread execution with different priorities.
4. Create two classes:
 - One implements Runnable and overrides the run() method.
 - Another extends Thread and overrides the run() method.

Create and start multiple threads from both classes and observe the difference in behavior. Explain which approach is more suitable in different scenarios.

5. Develop a Java program that simulates a simple bank account system where multiple threads (representing users) attempt to withdraw money from the same account. Use synchronized methods to prevent race conditions and ensure correct balance updates.
6. Create a Java program where a thread prints numbers from 1 to 20. Allow the user to suspend and resume the thread execution using keyboard input (S for suspend, R for resume). Use proper synchronization to handle the suspension and resumption.

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