**Thread Interruption**

Thread interruption in Java is a mechanism that allows one thread to signal another that it should stop what
it's doing. However, interruption does not forcibly stop a thread; it merely sets an interruption flag, which the interrupted thread can check. The thread must then decide how to handle the interruption.

A typical pattern for handling interruption is to periodically check the thread's interruption status using the
`isInterrupted()` method or handle the `InterruptedException`. When a thread is sleeping or waiting, it can be interrupted, causing an InterruptedException. At this point, the thread can either exit or reset the interruption status based on the logic needed.

**Fork/Join Framework**

The Fork/Join framework in Java is used to divide tasks into smaller subtasks, which can then be processed
in parallel, taking advantage of multiple processor cores. It's based on the divide-and-conquer approach,
where a task is recursively split into smaller chunks using the `fork()` method and the results are combined
using the `join()` method.

**Deadlock and Prevention Techniques**

Deadlock occurs when two or more threads are blocked forever, each waiting for the other to release a
resource. This can happen when the following four conditions are met:

1. Mutual exclusion: Only one thread can hold a resource at a time.
2. Hold and wait: A thread holding at least one resource is waiting for additional resources held by another
thread.
3. No preemption: Resources cannot be forcibly taken away from threads.
4. Circular wait: A chain of threads exists, where each thread holds a resource the next thread needs.

Prevention techniques include:

**Ordered Locking:** Ensuring that locks are always acquired in a consistent, predefined order.
**Timeouts:** Using timeouts when acquiring locks so that a thread can give up trying to acquire a resource
if it takes too long.
**Deadlock Detection**: Actively monitoring for cycles of blocked threads and breaking deadlocks by
aborting one of the involved threads