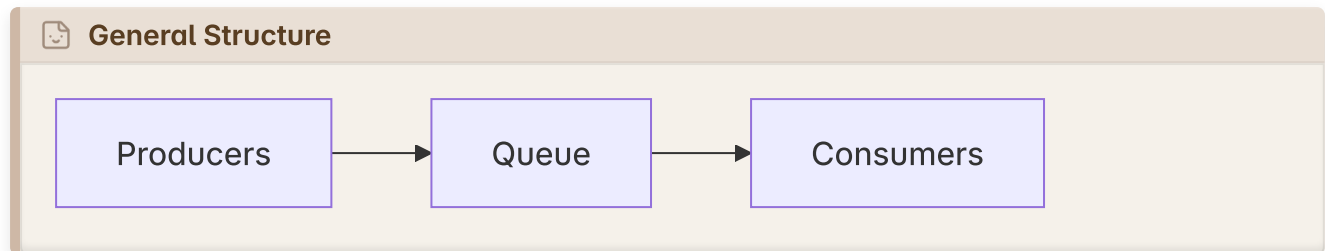# Producer-Consumer Pattern

One or more threads generate data (producers) while other threads process that data (consumers). They communicate through a shared buffer/queue.

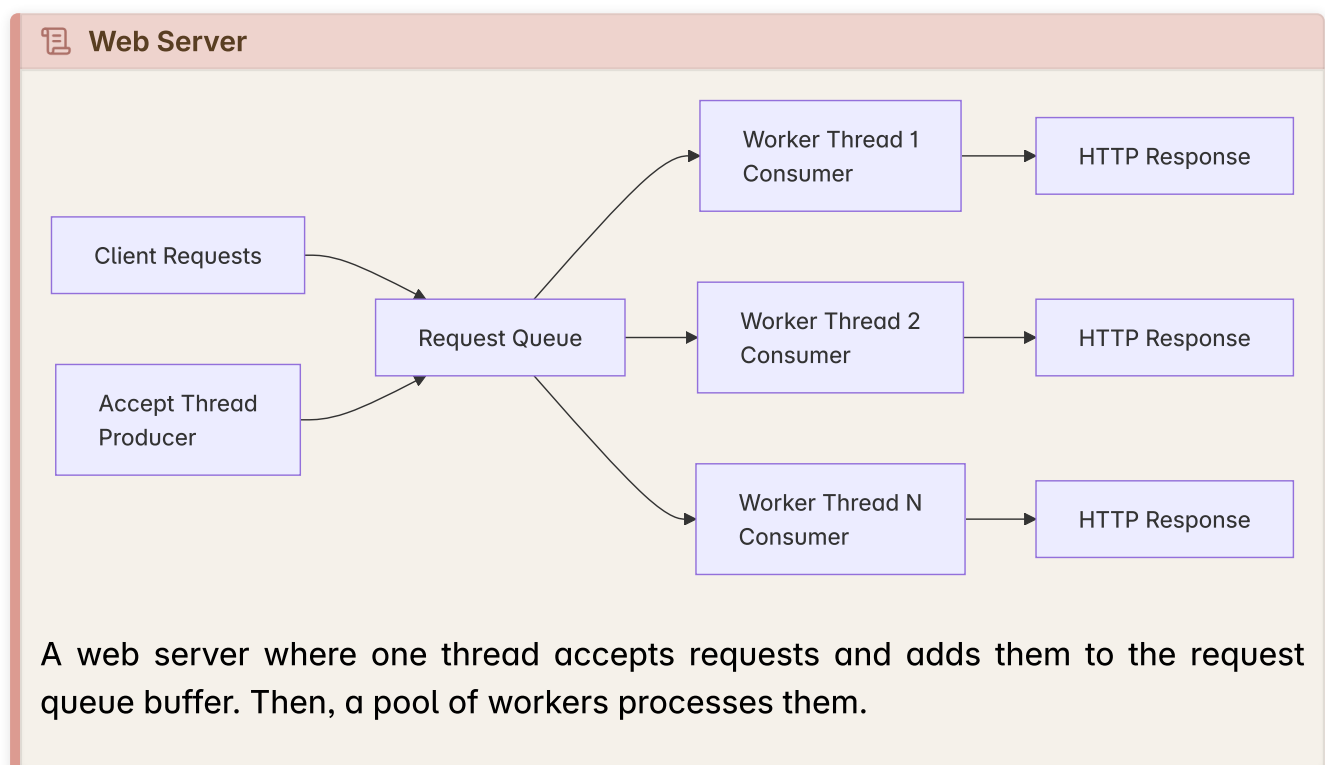Simplest threads.

🙂 General Structure

How it works:

- Producers add items to a queue if not full
- Consumers remove items from the queue if not empty
- Synchronizing who gets to use the queue ensure safety.

Benefits:

- Decouples data generation and processing, so there is freedom of prioritization as to who gets more CPU resources.

📜 Web Server

A web server where one thread accepts requests and adds them to the request queue buffer. Then, a pool of workers processes them.

Design Considerations

Ask yourself this when choosing the design pattern:

- Do you have data generators that work at different speeds than data processors?
- Is there a natural separation between data creation and data consumption?
- Are your producers and consumers naturally independent operations?