Systems Programming (2024 Fall)
Programming Assignment 4

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1.
2. Synchronization is handled by checking the following three conditions:

- The frontend queue is empty.

- The worker queue is empty.

- There are no threads currently performing a job.

If all three conditions are fulfilled, then all threads are synchronized.

The last condition is maintained by a `running_count` variable, representing the number of threads that has popped a request or work from the queue but is still processing it. This variable is protected by a mutex (`running_mutex`).

When a thread has finished its job, it signals the condition variable `done`, which is waited by `tpool_synchronize()`. This way, `tpool_synchronize()` will not busy wait.