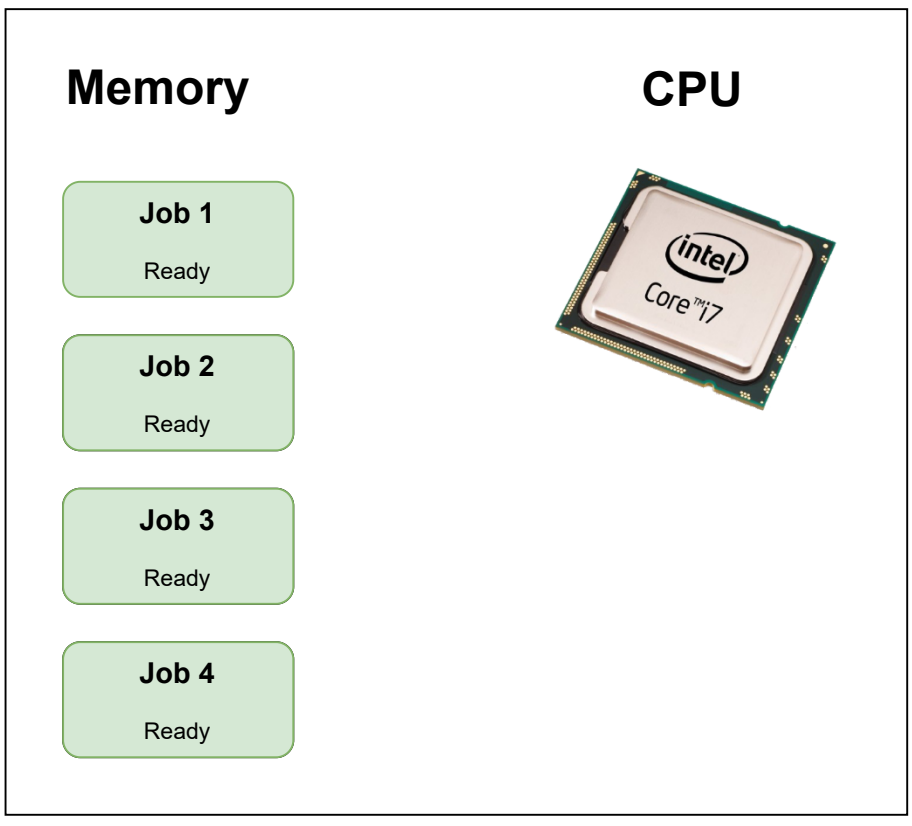
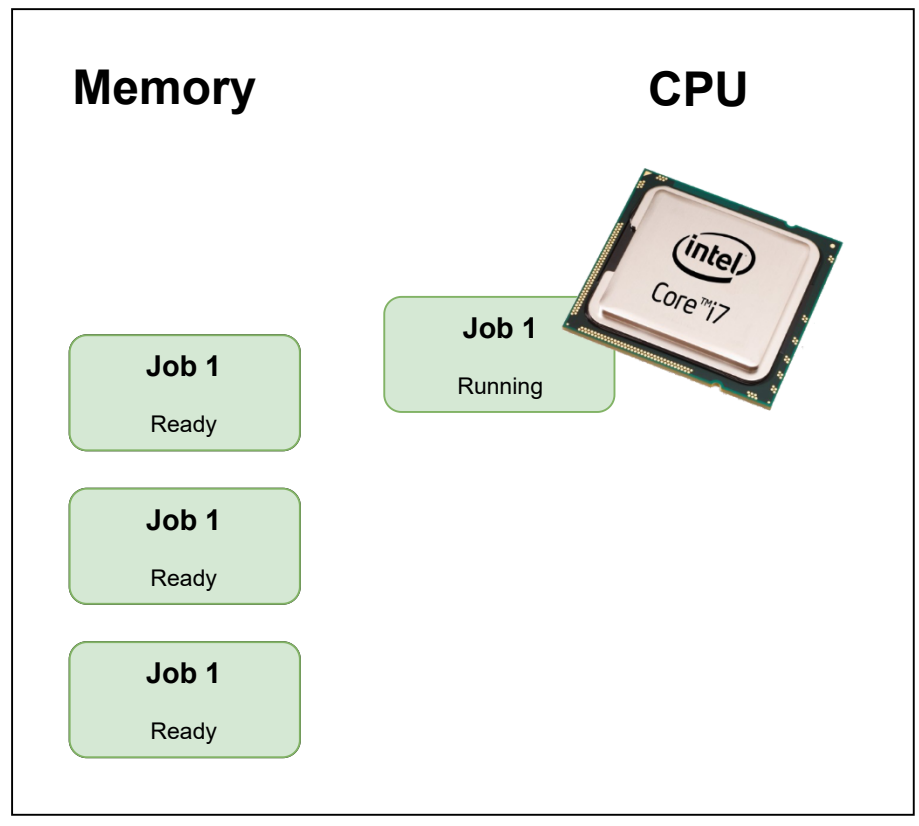
In a multiprogramming system, several jobs are kept in memory at the same time. Initially, all jobs are int the ready state



One of the ready jobs is selected to execute on the CPU and changes state from ready to running. In this example, job 1 is selected to execute.



Instead of idle waiting for the I/O request to complete, one of the ready jobs is selected to execute on the CPU and have its state change from ready to running. In this example job 4 is selected to execute, based on the scheduling algorithm

Eventually, the running job makes a request for I/O and the state changes from running to waiting.

Eventually the the I/O request job 1 is waiting for will complete and the CPU will be notified by an interrupt. In this example, job 1 was waiting for a keypress on the keyboard.

The state of the waiting job (job 1) will change from waiting to ready.