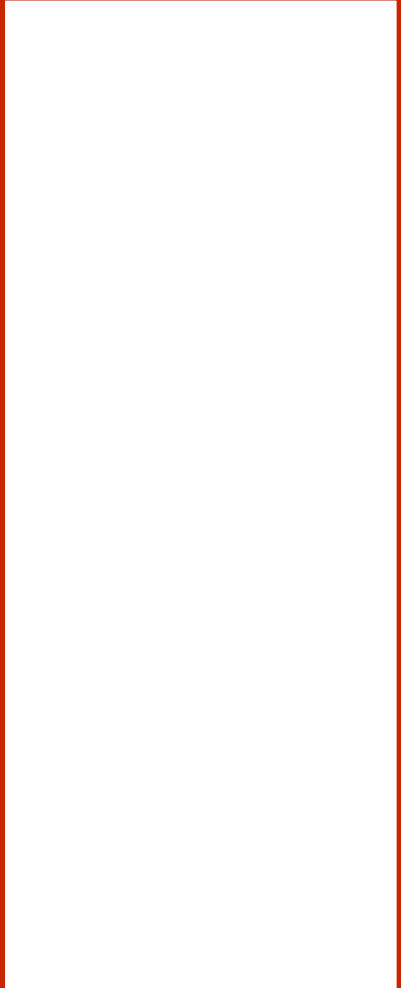




Running multiple programs concurrently



prog A

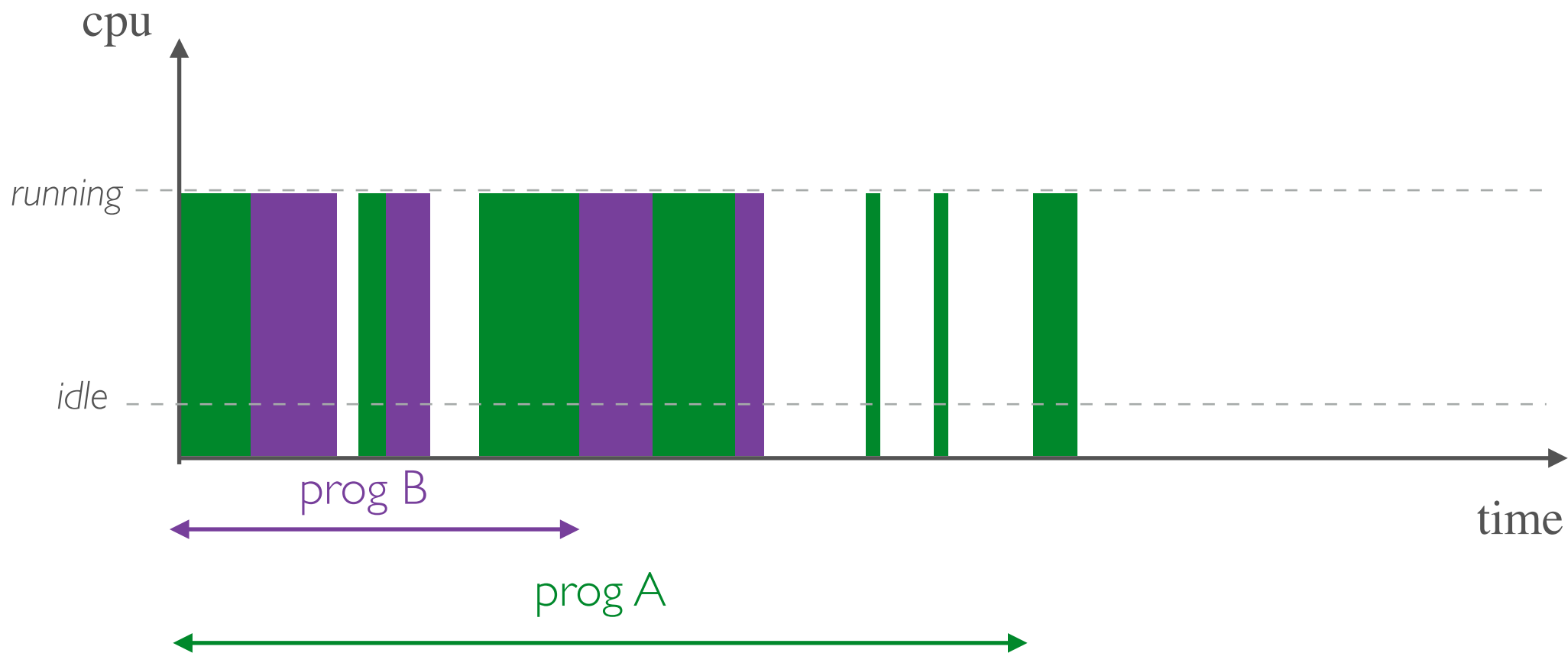
stack A

heap A

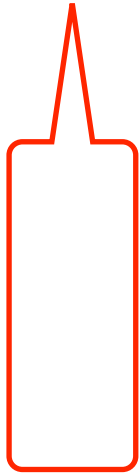


prog B





**Problem:** what if the program does not do any IO and use the CPU for a long time (a.k.a starvation problem)



stack B

heap B





**Problem:** the programs and their stacks must co-exists in memory (coming next with virtual memory)

1/0

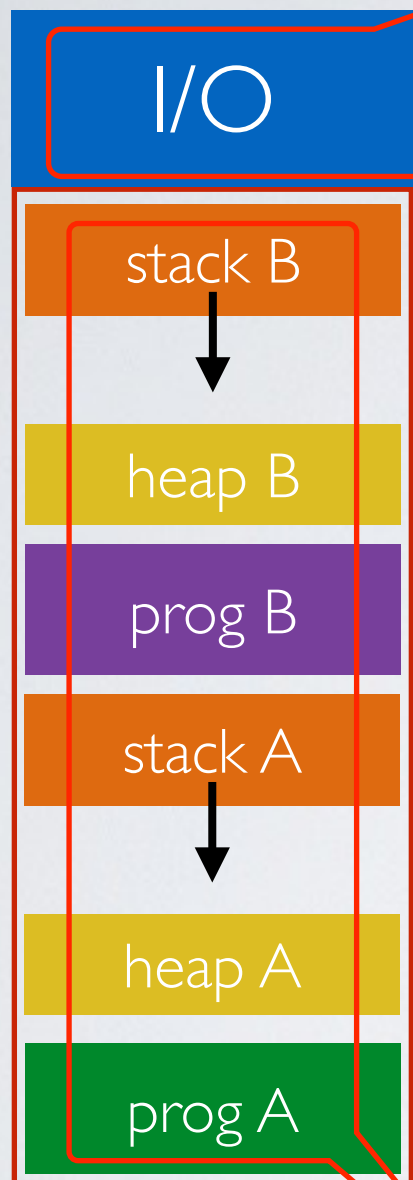


**Problem:** concurrent access to I/O devices  
must be synchronized

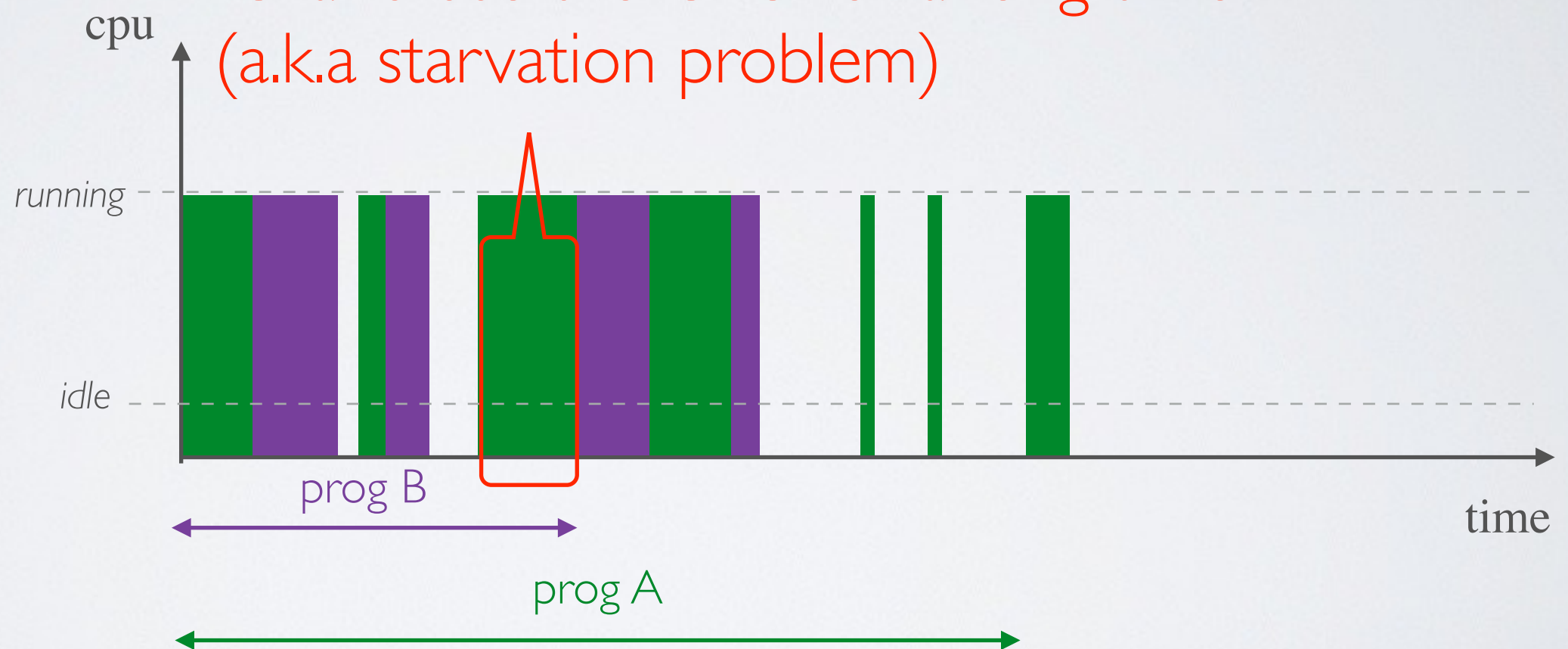


# Running multiple programs concurrently

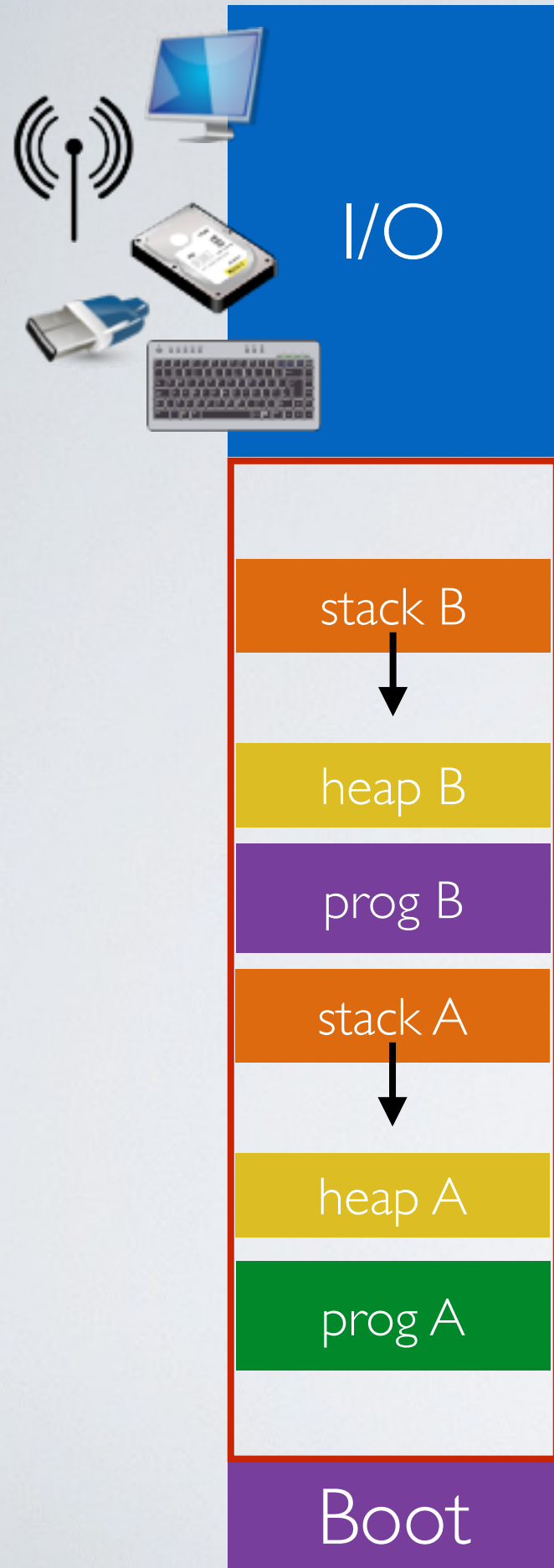
**Problem:** concurrent access to I/O devices must be synchronized



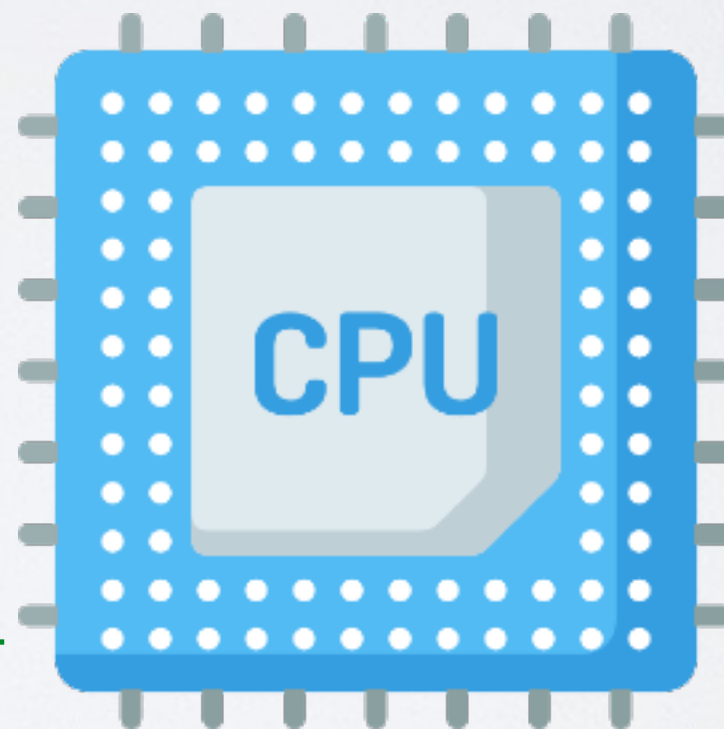
**Problem:** what if the program does not do any I/O and use the CPU for a long time (a.k.a starvation problem)



**Problem:** the programs and their stacks must co-exists in memory (coming next with virtual memory)



Using the clock  
to trigger an interrupt



esp

eip