Answer to question A:

Answer to question B:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Thread** | **Line** | **Flag 0** | **Flag 1** | **Lock 0** | **Lock 1** |  | **Flag 0 OR Lock 0** | **Flag 1 OR Lock 1** |
| Both | Starting | 0 | 0 | 0 | 0 |  | FALSE | FALSE |
| A | 1 | 1 | 0 | 0 | 0 |  | TRUE | FALSE |
| B | 1 | 1 | 1 | 0 | 0 |  | TRUE | TRUE |
| A | 2 | 1 | 1 | 0 | 0 |  | TRUE | TRUE |
| B | 2 | 1 | 1 | 0 | 0 |  | TRUE | TRUE |
| A | 3 | 1 | 1 | 0 | 0 |  | TRUE | TRUE |
| B | 3 | 1 | 1 | 0 | 0 |  | TRUE | TRUE |
| A | 4 | 1 | 1 | 0 | 1 |  | TRUE | TRUE |
| B | 4 | 1 | 1 | 1 | 1 |  | TRUE | TRUE |
| A | 5 | 0 | 1 | 0 | 1 |  | FALSE | TRUE |
| B | 5 | 0 | 0 | 1 | 1 |  | TRUE | TRUE |
| A | 6 | 0 | 0 | 1 | 1 |  | TRUE | TRUE |
| B | 6 | 0 | 0 | 1 | 1 |  | TRUE | TRUE |
| A | 7 | 0 | 0 | 1 | 1 |  | TRUE | TRUE |
| B | 7 | 0 | 0 | 1 | 1 |  | TRUE | TRUE |
| A | 8 | 1 | 0 | 1 | 1 |  | TRUE | TRUE |
| B | 8 | 1 | 1 | 1 | 1 |  | TRUE | TRUE |
| At this point, both threads re-enter the while loop. Since the locks are never updated, they will stay inside this loop forever, that is, if the schedular keeps a "per-line fair execution time" approach. As such, one could state a deadlock has occurred. I say "could", cause it’s my understanding that a deadlock occurs when 2 processes enter a waiting state and then wait for the other to signal, they can continue. The threads in the scenario above are technically not in a waiting state, they are still running, just indefinitely. But that’s a technicality... | | | | | | | | |

Answer to question C: