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ECSE 427

Assignment 1

PART 1

Q1

- Step 0: flag[0] = false, flag[1] = false
- Step 1: P0 sets flag[0] = true. Process swaps to P1
- Step 2: P1 sets flag[1] = true. Process swaps to P0
- Step 3: P0 runs in while loop
- Step 4: P1 runs in while loop
- Step 5: Both processes stuck in while loop → Deadlock

```
/* process 0 */
.
.
flag[0] = true;
while (flag[1]);
/* critical section */
flag[0] = false;
.
.
```

```
/* process 1 */
.
.
flag[1] = true;
while (flag[0]);
/* critical section */
flag[1] = false;
.
.
```

Q2

- Step 0: turn = 0
- Step 1: P0 executes critical section. P1 isn't near critical section yet
- Step 2: P0 finishes critical section. turn = 1
- Step 3: P0 wants to re-enter critical section but turn = 1. P1 still isn't near critical section
- Step 4: P0 is busy waiting in while loop causing starvation

```
/* process 0 */
.
.
while (turn != 0);
/* critical section */
turn = 1;
.
.
```

```
/* process 1 */
.
.
while (turn != 1);
/* critical section */
turn = 0;
.
.
```

PART 2

Test File – Init1

init1.txt

```
reserve Amro A 111
reserve TonyA0 a 100
reserve Mathew B 210
reserve MyGuyA1 A
reserve MyDudeB0 B
reserve Abbas b 104
reserve AbbasA5 A 105
reserve Lemao B 200
status


reserve Boi BB 206
reserve AbdullahA2 A
reserve AbuB1 B
reserve ButataB2 B 202
status
init
status
reserve HamB6 B 206
reserve Bam B 206
reserve FamB0 B
status
reserve comp310A0 A
exit
```

Test File – Init2

init2.txt

```
init
reserve personB0 B
reserve personB1 B
reserve personB2 B
reserve personB3 B
status
reserve personB4 B
reserve personB5 B
status
reserve invalidNum A ###
reserve invalidNum A 111
reserve invalidSection C
reserve invalidSection AA 100
reserve personA1 A 101
reserve personRand A
status

reserve personA2 A 102
reserve personA3 A 103
reserve personA4 A 104
reserve personRand A
reserve tableTaken A 105
reserve personA6 A 106
reserve personA7 A 107
reserve personA8 A 108
reserve tableTaken A 108
reserve person9 A 109
reserve sectionFull A
status

exit
```

To view trace of the outputs of the two test files being run concurrently, please refer to the files **out1.txt** and **out2.txt**. The program was run using rand time generators so the output might change a little from run to run.
The file **out1.txt** is the output of the program using the **init1.txt** input file.
The file **out2.txt** is the output of the program using the **init2.txt** input file.