

CSSE 332 -- OPERATING SYSTEMS

Condition Variables II

Name: _____

Question 1. (5 points) Consider the following sequence of events, we have three threads, \mathbf{T}_1 , \mathbf{T}_2 , and \mathbf{T}_3 . Also, assume that $t_1 < t_2 < t_3$.

Time	Thread	Event
...
t_1	\mathbf{T}_1	<code>pthread_cond_wait(&c, &m);</code>
...
...
t_2	\mathbf{T}_2	<code>pthread_cond_wait(&c, &m);</code>
...
...
t_3	\mathbf{T}_3	<code>pthread_cond_signal(&c);</code>

Some time after t_3 , which one of the waiting threads (\mathbf{T}_1 and \mathbf{T}_2) would wake up and start executing?

A. \mathbf{T}_1 .B. \mathbf{T}_2 .C. Neither \mathbf{T}_1 nor \mathbf{T}_2 .

D. Other: _____

Question 2. (15 points) The following pieces of code contains errors, find and fix these errors.

```
1 pthread_cond_t c = PTHREAD_COND_INITIALIZER;
2 pthread_mutex_t lock = PTHREAD_MUTEX_INITIALIZER;
3
4 void *thread1(void *unused) {
5     // some code here...
6
7     // need to wait on a condition variable
8     while(!ready) {
9         pthread_cond_wait(&c, &m);
10    }
11 }
12
13 void *thread2(void *unused) {
14     // some code here
15
16     ready = 1;
17     pthread_cond_signal(&c);
18 }
```

```
1 pthread_cond_t c = PTHREAD_COND_INITIALIZER;
2 pthread_mutex_t lock = PTHREAD_MUTEX_INITIALIZER;
3
4 void *thread1(void *unused) {
5     // some code here...
6
7     // need to wait on a condition variable
8     pthread_cond_wait(&c, &m);
9 }
10
11 void *thread2(void *unused) {
12     // some code here
13
14     pthread_mutex_lock(&lock);
15     ready = 1;
16     pthread_cond_signal(&c);
17     pthread_mutex_unlock(&lock);
18 }
```

```
1 pthread_cond_t c = PTHREAD_COND_INITIALIZER;
2 pthread_mutex_t lock = PTHREAD_MUTEX_INITIALIZER;
3
4 void *thread1(void *unused) {
5     // some code here...
6
7     // need to wait on a condition variable
8     pthread_mutex_lock(&lock);
9     if(!ready) {
10        pthread_cond_wait(&c, &m);
11    }
12    pthread_mutex_unlock(&lock);
13 }
14
15 void *thread2(void *unused) {
16     // some code here
17
18     pthread_mutex_lock(&lock);
19     ready = 1;
20     pthread_cond_signal(&c);
21     pthread_mutex_unlock(&lock);
22 }
```

Question 3. (10 points) Please write down two **sentences** describing two new things that you learned in this session.

Question 4. (10 points) Please write down two things that you are still not very clear about, or any questions that you might have that the session did not go over or did not cover well.