




United International University

Name
(Optional)

ID No.

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Section


Invigilator's
Signature with date

Course Code

Trimester / Semester: Spring / Summer / Fall, 20.....

Date:

Name of Exam: Class Test / Mid-term / Mid-term (Makeup/Improvement) / Final / Final (Makeup/Improvement)

Bus - Passenger Problem

mutex m

condvar cv-bus-arrived, cv-passenger-boarded

int waiting-count = 0

bool bus-arrived = false

~~type~~

passenger-thread() {

lock(m);

waiting-count++;

while(!bus-arrived) {

wait(cv-bus-arrived, m);

}

board();

signal(cv-passenger-boarded);

unlock(m);

}

```
bus-thread() {
```

```
    lock(m) ;
```

```
    bus-arrived = true ;
```

```
    int n = min(waiting-count, K) ;
```

```
    for int i = 1 to n:
```

```
        signal(cv-bus-arrived)
```

```
        wait(cv-passenger-boarded, m)
```

```
    waiting-count -= n
```

```
    bus-arrived = false
```

```
    unlock(m)
```

```
}
```

Barber Shop Problem

mutex m

condvar cv-barber, cv-customer

int waiting-count = 0

~~bool barber-busy = false~~

Barber:

while(true) {
 lock(m)

 if (waiting-count == 0):

 wait(cv-barber, m)

 signal(cv-customer)

~~cutHair()~~

 unlock(m)

 cutHair()

}

Customer:

lock(m)

if (waiting-count == N):

 unlock(m)

 leave() // this function does not return

waiting-count ++

signal(cv-barber, m)

wait(cv-customer, m)

getHairCut()

waiting-count --

unlock(m)