آریا خلیق

تمرین شماره ۴ سیستم‌عامل

a)
full = 0

# producer
while True:
   item = produce_item()
   wait(mutex)
   enter_item(item) #C.S.
   signal(mutex)
   signal(full)

# consumer
while True:
   wait(full)
   wait(mutex)
   removed_item = remove_item() #C.S.
   signal(mutex)
   consume_item(removed_item)

b)

```
# full = 0
# empty = 1
# producer
while True:
    item = produce_item()
    wait(empty)
    wait(mutex)
    enter_item(item) #C.S.
    signal(mutex)
    signal(full)

# consumer
while True:
    wait(full)
    wait(mutex)
    removed_item = remove_item()
    signal(mutex)
    signal(empty)
    consume_item(removed_item)
```

c)
```
#asghar = 1
#lockwriter = 1

# reader
while True:
    ...
    wait(asghar)
    signal(asghar)
    reader_counter += 1
    if (reader_counter == 1):
        wait(lockwriter)

    READ # C.S.

    reader_counter -= 1
    if (reader_counter == 1):
        signal(lockwriter)
    ...

# writer
while True:
    ...
    writer_counter += 1
    if (writer_counter == 1):
        wait(asghar)

    wait(lockwriter)
    WRITE # C.S.
    signal(lockwriter)

    writer_counter -= 1
    if (writer_counter == 0):
        signal (asghar)
    ...
```

d)

```
#FIFO = 1
#getResource = 1
#mutex = 1

# writer
while True:
    wait(FIFO)
    wait(getResource)

    WRITE #C.S.

    signal(FIFO)
    signal(getResource)

# reader
while True:
    wait(FIFO)
    wait(mutex)
    if(readerCount == 0)
        wait(getResource)
    readerCount += 1

    signal(FIFO)
    signal(mutex)

    READ #C.S.

    wait(mutex)
    if (readerCount == 1)
        signal(getResource)
    readerCount -= 1
    signal(mutex)
```

e)

```
#barberReady = 0
#accessWRSeats = 1
#custReady = 0
#numberOfFreeWRSeats = n

# customer
wait(accessWRSeats)
if numberOfFreeWRSeats > 0:
    numberOfFreeWRSeats -= 1
    signal(custReady)
    signal(accessWRSeats)
    wait(barberReady)
    getHaircut()
else:
    signal(accessWRSeats)
    leave()

# barber
wait(custReady)
wait(accessWRSeats)
numberOfFreeWRSeats += 1
signal(barberReady)
signal(accessWRSeats)
cutHair()
```