CONCURRENT SYSTEM DESIGN (SE 3BB4) TUTORIAL 6

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Marking Java implementation of assignment 1

Assessment

1. if you implement the model correctly, you get 2. Otherwise, 0 and stop.
2. if your app can be runnable (without compiling error), you get 1 more. Otherwise 0 and stop.
3. if your app can be played and determine the winner, you get 1 more. Otherwise 0.

Office: ITB 204, from 5:00 PM to 6:00PM

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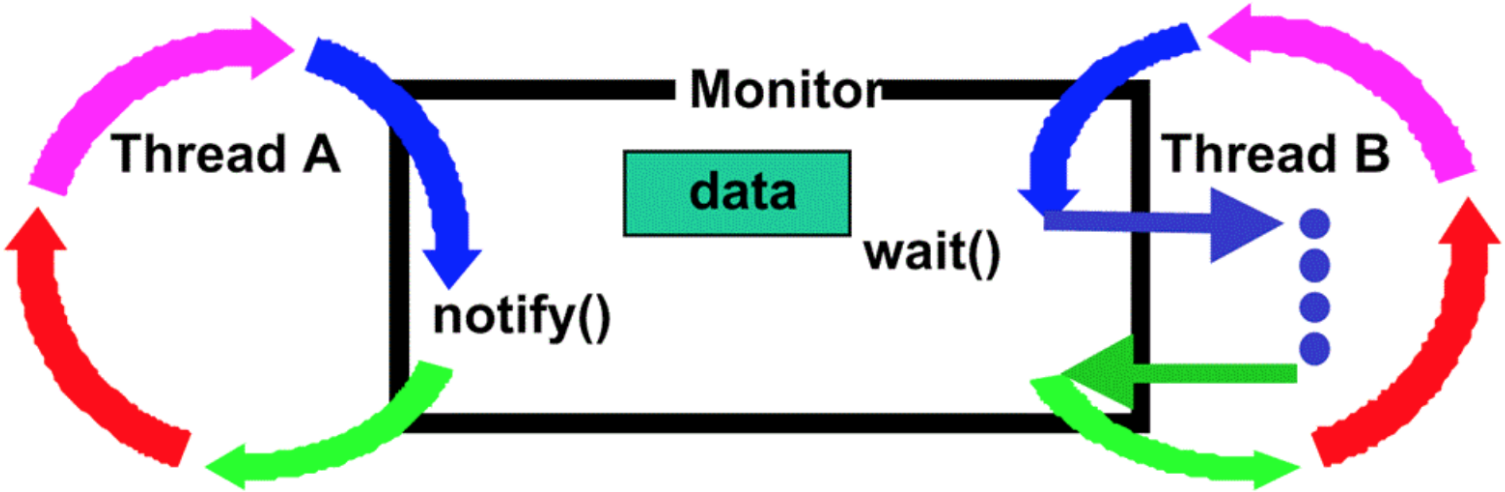
Review: Implement FSP in Java

- The live is more complicated.
- Forget the patterns.
- Think about:
  - Actions are implemented as methods
  - Active entities are implemented as threads
  - Passive entities are implemented as monitors

Reiew: Java's synchronization

- **synchronized** keyword
- **public final void notify()** method
- **public final void notifyAll()** method
- **public final void wait()** method

Reiew: Monitor - condition synchronization



Each guarded action in the model of a monitor is implemented as a `synchronized` method which uses a while loop and `wait()` to implement the guard. The while loop condition is the negation of the model guard condition.

Changes in the state of the monitor are signaled to waiting threads using `notify()` or `notifyAll()`.

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Dining Philosohpers

Q and A

Source code location

Source code: https://goo.gl/99TSIR

Producer - consumer

Description:

- A buffer of characters is synchronized by 2 separate semaphores
  - full: counts number of characters stored
  - empty: counts number of spaces
- The buffer has to methods:
  - put: store a charater into the buffer, cannot be called if buffer is full.
  - get: get a character out off the buffer, cannot be called if buffer is empty.

Producer - consumer

1. Where is the deadlock?

Producer - consumer

1. Where is the deadlock?
2. How to fix it?

Producer - consumer

1. Where is the deadlock?
2. How to fix it?
3. What experience can be deducted?

Another simple deadlock

1. Where is the deadlock?
2. How to fix it?
3. What experience can be deducted?

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Monitor: deadlock redemption

Why only "redemption" not "elimination"?

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- It still requires the effort to design your system carefully.

Monitor: deadlock redemption

Why only "redemption" not "elimination"?

- It still requires the effort to design your system carefully.

Advantages of monitor:

- Reducting the number of semaphores.
- Centralize the semaphores.

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Quiz

Describe the deadlock of "Producer - Consumer" problem. (Upload doc, docx, pdf or txt file only.)