SOLUTIONS FOR THE SECOND 3360/6310 QUIZ

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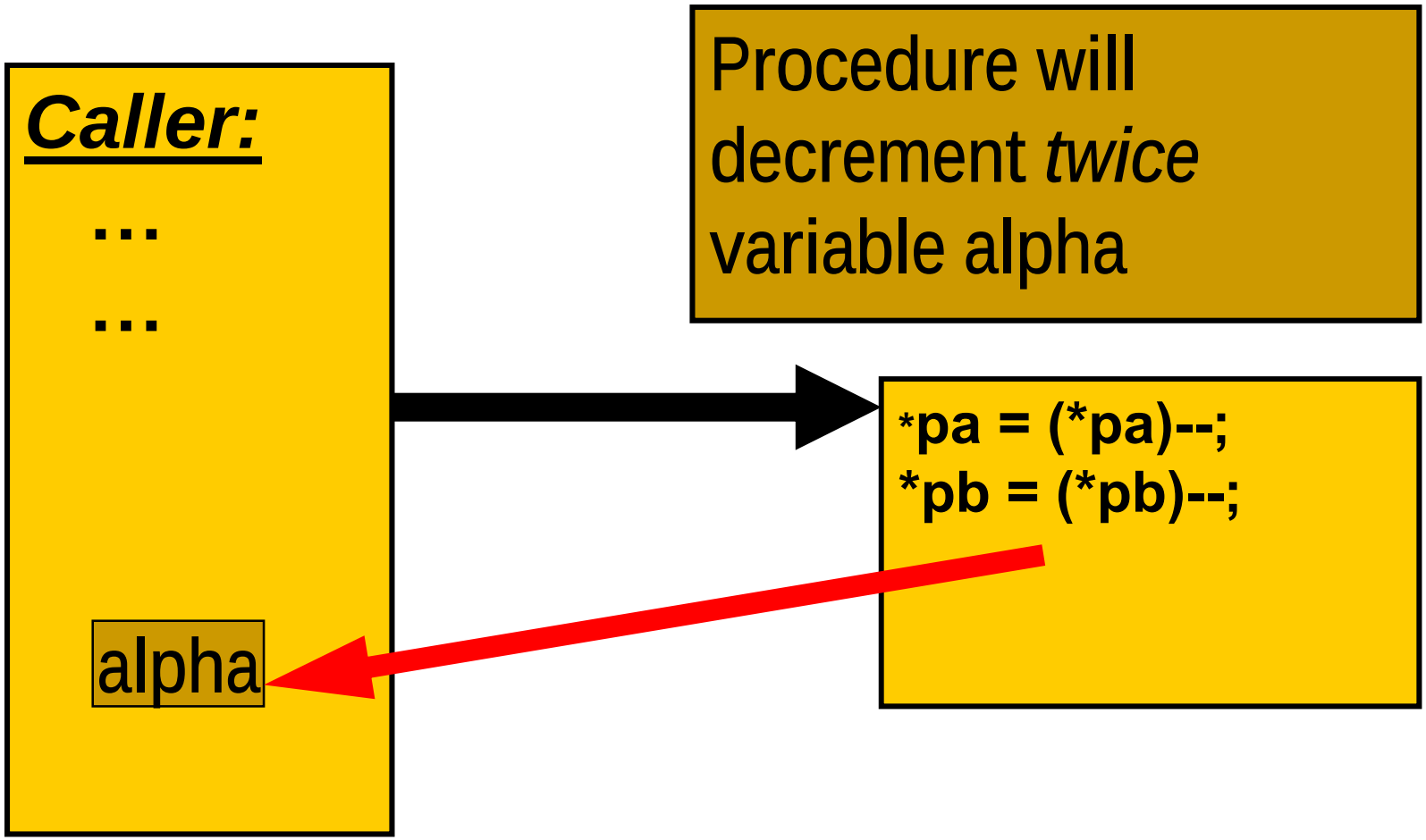
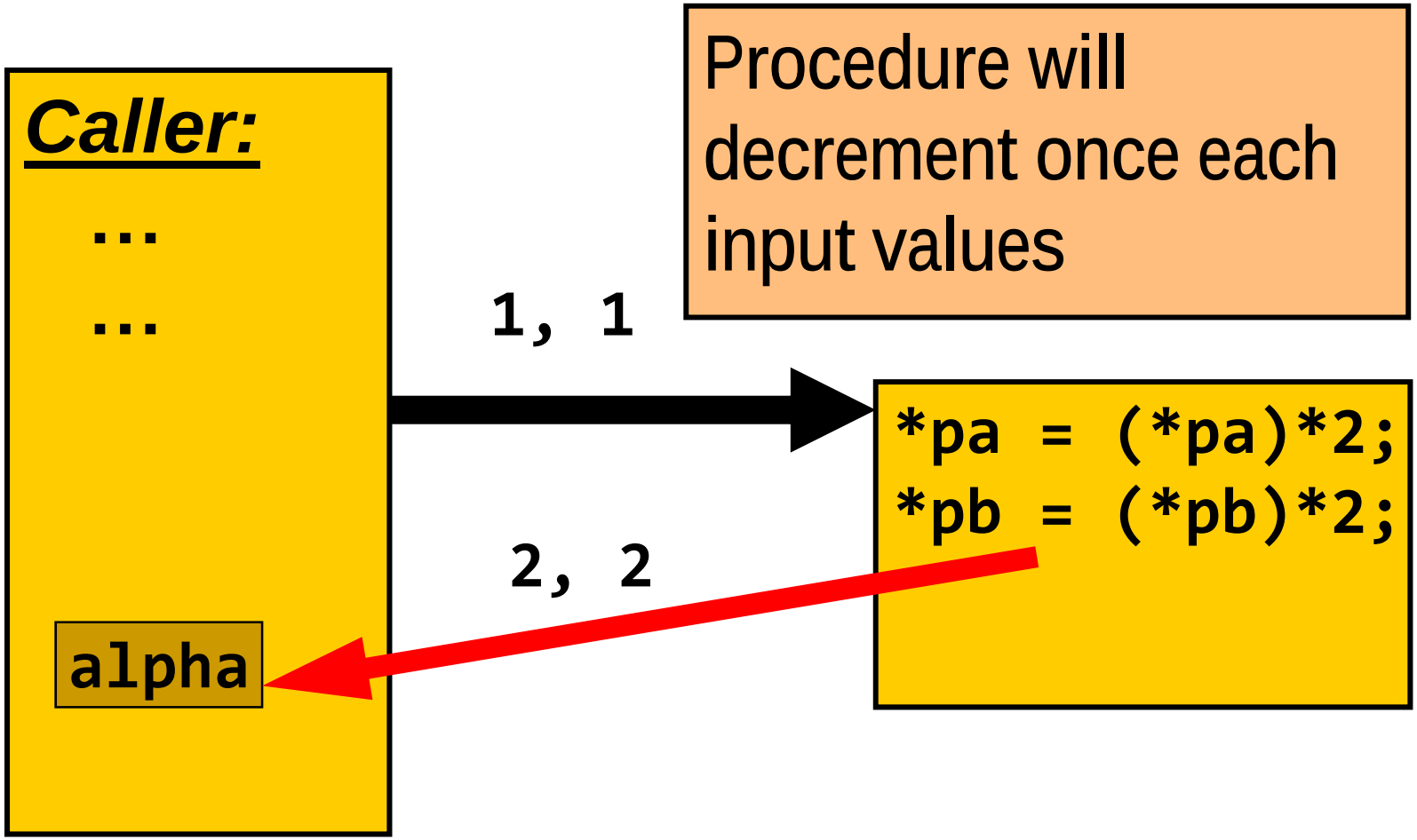
First question

- Consider the function
  - ```
    void doubledouble(int *pa, int *pb) {
      *pa = (*pa)*2;
      *pb = (*pb)*2;
    } //  doubledouble
    ```
- and assume the following calling sequence:
  - ```
    alpha = 1;
    doubledouble (&alpha, &alpha);
    ```

Passing by reference



Passing by value and result



First question

- What will be the value of **alpha *after the call*** assuming that the call was:
  - A ***conventional procedure call***?
    - **alpha = 4**
  - A ***remote procedure call***?
    - **alpha = 2**

Second question

- What should a System V Release 4 do
  - When a process returns to the ready queue after having exhausted its CPU time slice**?**
  - When a process returns to the ready queue after having performed a system call?

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    - **Decrease its priority**
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Second question

- What should a System V Release 4 do
  - When a process returns to the ready queue after having exhausted its CPU time slice**?**
    - **Decrease its priority**
  - When a process returns to the ready queue after having performed a system call?
    - **Increase its priority**

Third question

- Consider a stride scheduler that manages a ready queue with two processes A and B, such that
  - The stride of process A is equal to 4,
  - The stride of process B is equal to 10.

Third question

- When the scheduler starts a new epoch,
  - Which process will the scheduler select ***first***?
    - **A**
      - Original pass values are equal to stride
        P(A) = 4, P(B) = 10
      - Pick the process with lower pass value

Third question

- When the scheduler starts a new epoch,
  - Which process will the scheduler select ***next***?
  - **A**
    - New pass values are
      P(A) = 4+ 4 = 8, P(B) = 10
    - Pick the process with lower pass value

Fourth question

- What is the ***main purpose*** of the Intel **exch register, lockvar** instruction?

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  - **To implement spinlocks/buy waits**

Fourth question

- What is the ***main advantage*** of ***idempotent remote procedures***?

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- What is the ***main advantage*** of ***idempotent remote procedures***?
  - **We do not have to worry about multiple executions of the procedure by a remote server**
    - **The outcome would be identical**

Fourth question

- Which is typically the ***least restrictive*** way to ***prevent deadlocks***?

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  - **Denying the circular wait condition**

Fourth question

- What is the difference between ***blocking*** and ***non-blocking*** receive primitives?

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- What is the difference between ***blocking*** and ***non-blocking*** receive primitives?
  - **A blocking receive wait until it can retrieve a message from the process mailbox**
  - **A non-blocking primitive does not**

Fourth question

- What is the ***main advantage*** of ***datagrams***?

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- What is the ***main advantage*** of ***datagrams***?
  - **They do not require setting up any kind of connection *before* sending data**
  - **Best for short interactions**

Fourth question

- When is it a good idea to use ***busy waits***?

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- When is it a good idea to use ***busy waits***?
  - **For short waits on multicore architectures**

Fifth question

- What happens when a monitor procedure ***signals*** a condition X and
  - A monitor procedure is waiting for that signal?
  - No monitor procedure is waiting for that signal?

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- What happens when a monitor procedure ***signals*** a condition X and
  - A monitor procedure is waiting for that signal?
    - **The calling procedure releases the monitor**
    - **One of the waiting procedures is allowed to proceed**

Fifth question

- What happens when a monitor procedure ***signals*** a condition X and
  - No monitor procedure is waiting for that signal?
    - **The signal has no effect**

Sixth question

- What is the sole difference between ***streams*** and ***virtual circuits***?

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- What is the sole difference between ***streams*** and ***virtual circuits***?
  - **Streams do *not* preserve message boundaries**

Seventh question

- An interstate bus that can carry 40 passengers, has a single door that let one passenger get in or out at any time.
- Add semaphores to the following two functions to ensure that
  - The bus will never be overloaded and
  - Passengers will not collide with each other when embarking or debarking the bus.

Declarations

- `semaphore freeSeats = 40;`

  `semaphore door = _____;`

Get_on() function

```
get_on(){
    ____________________________;
    ____________________________;
    go_through_door();
    ____________________________;
    ____________________________;
} // get_on
```

Get_out() function

```
get_out(){
    ____________________________;
    ____________________________;
    go_through_door();
    ____________________________;
    ____________________________;
} // get_out
```

Declarations

- ```
  semaphore freeSeats =  40;

  semaphore door = 1; // mutex
  ```
  ```

Get_on() function

```
get_on(){
    P(&freeSeats); // must be first
    P(&door);
    go_through_door();
    V(&door);
    ____________________________;
} // get_on
```

Get_out() function

```
get_out(){
    ____________________________;
    P(&door);
    go_through_door();
    V(&door);
    V(&freeSeats);
} // get_out
```