

Quiz 2, CSCI 210, Spring 2004

Name: _____

1. [10 pts] Suppose we were to run the program at right. Which of the following outputs might occur? (Place a checkmark to each possible output.)

- a. 1 1 2 4
- b. 1 2 3
- c. 1 2 3 4
- d. 1 2 4
- e. 3 1 2 4
- f. 4
- g. 4 3 2 1
- h. 4 4 4 4

```
#include <stdio.h>

int i = 1;

int main() {
    while(i < 4 && fork() != 0) {
        i++;
    }
    printf("%d ", i);
    exit(0);
}
```

2. [10 pts] Because the CPU can run only one thread of execution at once, when a user program is running, the operating system cannot be. How, then, can the OS manage to preempt a running program that runs for a long period of time and attempts to run beyond its time slice?

3. [10 pts] At right, complete the Java program so that it runs two threads. One thread should execute the following code to continually update total

```
for(int i = 1; true; i++) total += i;
```

The other thread should execute the following code to periodically display the current total.

```
while(true) {
    System.out.println(total);
    try { Thread.sleep(40);
    } catch(InterruptedException e) {}
}
```

```
public class Counter extends Thread {
    static int total = 0;
```

```
public static void main(String[] args) {
```

Hint: The main method runs in its own thread. After it initiates a thread for one of the tasks, main can continue on to perform the the other task in its own thread.

```
}
}
```