

## Tutorial 1

Please complete all the questions given and submit on or before the due date

1. Differentiate between Symmetric and Asymmetric Multiprocessing with example.
2. What do you understand about Multiprogramming and Multitasking systems?
3. Discuss Memory Hierarchy.
4. What are System Calls? Explain the two modes of Operating System.
5. What is Operating System and discuss in brief the different services provided by OS.
6. The structure of process  $P_i$  ( $i=0$  or  $1$ ) and  $P_j$  ( $j = 1$  or  $0$ ) is shown in the above code. Two processes,  $P_0$  and  $P_1$  share the following variables:

**boolean flag[2]; initially false**  
**int turn;**

Prove that the algorithm satisfies all three requirements for the critical-section problem.

```

Pi
flag [i] = true
while (flag [j])
{
    if (turn == j)
    {
        flag[i] = false;
        while(turn ==j);
        flag [i] = true;
    }
}

/* Critical Section */

turn = j;
flag[i] = false;

/* Remainder Section */
} while(true);
```

## 7. Case Study:

The Fibonacci sequence is the series of numbers 0, 1, 1, 2, 3, 5, 8, ....

Formally, it can be expressed as:

$fib\ 0 = 0$

$fib\ 1 = 1$

$fib\ n = fib\ n-1 + fib\ n-2$

Write a C program using the `fork()` system call that generates the Fibonacci sequence in the child process. The number of the sequence will be provided in the command line. For example, if 5 is provided, the first five numbers in the Fibonacci sequence will be output by the child process. Because the parent and child processes have their own copies of the data; it will be necessary for the child to output the sequence.

For this program all windows user have to install following packages for `fork()` to run in Cygwin:

- gcc package: follow atleast upto Step 2 from this link

<https://preshing.com/20141108/how-to-install-the-latest-gcc-on-windows/>

Step 1 is simply Cygwin installation. For step 2, your Cygwin setup should be inside the Cygwin folder.

- dos2unix package: will get the package from this link:  
<https://waterlan.home.xs4all.nl/dos2unix.html>

### Windows

[dos2unix-7.4.2-win64.zip](#) Windows 64 bit version. English

[dos2unix-7.4.2-win64-nls.zip](#) Windows 64 bit version. International

[dos2unix-7.4.2-win32.zip](#) Windows 32 bit version. English

[dos2unix-7.4.2-win32-nls.zip](#) Windows 32 bit version. International

