### MULTIPROCESSING vs. MULTITHREADING

What is Multiprocessing?

In computing, a **process** is an instance of a computer program that is being executed. Or simply Running program is also called as process.

Multiprocessing means  “ Having Two or more CPU’s in a single computer system”.

For example, if a computer system has dual core, and there are two process to run(execute) concurrently(at same time),  it can be achieved by assigning each processes to each core of the system. Hence, the two process can execute simultaneously.

In other words, multiprocessing can defined as multiple process can execute at same time rather than one after other.

In Multiprocessing, each process have different address space and resources.

Different types of Multiprocessing?

SMP(Symmetric multiprocessing): All CPU’s treat equal.

**symmetric multiprocessing** (SMP) involves a multiprocessor computer hardware architecture where two or more identical processors are connected to a single shared main memory and are controlled by a single OS instance. Most common multiprocessor systems today use an SMP architecture. In the case of multi-core processors, the SMP architecture applies to the cores, treating them as separate processors. Processors may be interconnected using buses, crossbar switches or on-chip mesh networks.

**Thread-Safe:** Thread safety is a computer programming concept applicable in the context of multi-threaded programs. A piece of code is thread-safe if it functions correctly during simultaneous execution by multiple threads. In particular, it must satisfy the need for multiple threads to access the same shared data, and the need for a shared piece of data to be accessed by only one thread at any given time.

Thread-safe code is code that will work even if many Threads are executing it simultaneously.