

## Process Scheduling in Operating Systems

- Why need for process scheduling ✓
- Cpu scheduler - short-term vs long-term ✓
- Role of dispatcher (context switch) ✓
- Preemptive vs nonpreemptive scheduling ✓
- scheduling criteria - comparing scheduling algorithms
- scheduling algorithms with examples:
- How process scheduling actually happens in linux ?
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### Need for Process Scheduling ↵

- In Some cases, there are no choice.
- When a process terminates, process scheduling should happen.
- when a process sleeps, process scheduling should happen.
- In other cases, when multiple process is waiting in memory to run, process scheduling is needed for faster response time and effective cpu utilization.

## I/O-Bound Vs Processor-Bound Processes

### I/o Bound Processes

- Processes that spends much of its timing on submitting and waiting on I/o requests.
- Such processes is runnable for only short durations, since it eventually blocks(sleeps) waiting on I/O (Keyboard I/O, network I/O, disk I/O etc.)
- Most graphical user interface (GUI) applications are I/o bound even if they never read/write to disk.
- Because they spend most of their time waiting on user interaction via Keyboard and mouse.
- Example: Text editors, Terminal, applications which spend most of their time on network calls or reading/writing to files etc.

## Processor - Bound Processes

- The processes that spend much of their time executing code.
- They tend to run until they are preempted since they don't block on I/o often.
- A typical example of a processor-bound is one executing an infinite loop. {  
  while(  
    "  
      "  
  )  
    {  
      "  
    }  
  }  
  }
- Other examples include programs that perform a lot of mathematical calculations - matrix multiplication.

### Note :

- Many processes can be both I/o bound and CPU bound at different times.
- Word processor which normally sits waiting for key processes. But when the keys are pressed, it does some spell checking (processor bound).
- Similarly, most of the games one plays depends on mouse and Keyboard presses. But a lot of CPU work is required to render the graphics.