**Take Home Assignment**

**Instructions:**

* Choose one topic from each set to prepare an approximately two-page writeup (can be more, not less) on each of the 2 topics.
* I would encourage you to search the web extensively to bring insights about the topic.
* It would be in your interest to cite your sources (and their sources) thoroughly. Links to the sources should be provided at the end of the document.
* Please use the word app (accessed through webmail) and use its “references->insert endnote” functionality to cite your sources.
* Submissions should be in docx format (sorry) and need to be uploaded to moodle.
* Single spacing. Content font size 11pt. Try not to use too many lists

**SET - 1**

1. Please explain the Linux Memory Management (post 2.6) in details. What are memory zones and how do they help?
2. Contrast between Completely Fair Scheduling and O(1) scheduling . Which one would you prefer and why?
3. Explain the Kernel 2.6 Scheduling algorithm. What is the role of sleep\_avg in the scheduling process? Describe the process for updating TimeSlice for a non-real-time process

**SET - 2**

1. Please explain, in details, how semaphores work and what is the primary purpose of semaphores? Enumerate and differentiate with other mechanisms that provide similar functionalities
2. Explain the mechanisms provided by Linux 2.6+ to avoid Race condition (Kernel Synchronization)
3. Clearly differentiate b/w Process, Lightweight process, and Threads. What are process descriptors and different process states?