IT-253: Operating Systems Laboratory Handout

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In today's laboratory there is no evalaution of the assingments given. The evalautors and students' assignments are as follows:

171667IT144 to 181427IT110 : by Dr. B. Neelima
181220IT111 to 181017IT125: by Mr. Vinayaka
181299IT126 to 181436IT140: by Mr. Abhishek
181762IT141 to 181403IT154 and 181326IT238 : by Mr. Vikky
181875IT201 to 181190IT218: by Ms. Swathi
181418IT219 to 181471IT235 by Ms. Sujatha
181369IT236 to 181047IT254 by Ms. Anusha

You can implement the excercises in any language but preferably in C. The evalaution is to be completed on the same day. Late submission is subject to the availability of the evalautors and there will be late submission marks deduction until the next lab only.

Excercise 1: Write a program for factorial calculation using fork() system call.

Excercise 2:Create your own Virtual Machine and boot Ubuntu (64-bit) on the existing host operating system using Oracle virtual box.

Excercise 3: There is a shared resource which should be accessed by multiple processes. There are two types of processes in the system namely, **reader** and **writer**. Any number of **readers** can read from the shared resource simultaneously, but only one **writer** can write to the shared resource. The same way, when a **writer** is writing data to the resource, no other process can access the resource. A **writer** cannot write to the resource if there are non-zero number of readers accessing the resource at that time. From the above problem statement, it is evident that readers have higher priority than writers. If a writer wants to write to the resource, it must wait until there are no readers currently accessing that resource. So, based on this find an appropriate solution to the problem given using Monitors as well as Semaphores.

Help for Excercise 2:

Virtualbox installation instructions

Pre-Requisites

- Boot to ubuntu
- Ensure working internet connectivity

Steps

1. Update the package manager
   sudo apt-get update
2. Install gdebi, a DEB package installer
   sudo apt-get install gdebi
3. Download Virtualbox DEB package
   For Ubuntu 16.04 PCs

wget https://download.virtualbox.org/virtualbox/6.1.0/virtualbox-6.1_6.1.0-135406~Ubuntu~xenial_amd64.deb

   For Ubuntu 18.04 PCs (newer)

wget https://download.virtualbox.org/virtualbox/6.1.0/virtualbox-6.1_6.1.0-135406~Ubuntu~bionic_amd64.deb

4. Install the downloaded package using gdebi
   sudo gdebi virtualbox-6.1_6.1.0-135406~Ubuntu~xenial_amd64.deb
   Or
   sudo gdebi virtualbox-6.1_6.1.0-135406~Ubuntu~bionic_amd64.deb
   Enter the password and confirmation when prompted
5. Virtualbox should be now installed. Verify it by either by going to installed application list, or by executing the following command
   virtualbox