

# Assignment-2

## CS342: Operating System Lab

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### General Instruction

- Assignments should be completed and evaluated in the Lab session.
- Markings will be based on the correctness and soundness of the outputs. Marks will be deducted in case of plagiarism.
- Proper indentation & appropriate comments (if necessary) are mandatory in the code.

In today's lab session, The goal is to get familiar with (Linux) tools and files used for system and process behaviour information, monitoring and control.

1. Collect the following basic information about your machine using the **/proc** file system and answer the following questions:
  - (a) How many CPU sockets, cores, and CPUs does your machine have?
  - (b) What is the frequency of each CPU ?
  - (c) How much memory does your machine have ?
  - (d) How much of it is free and available? What is the difference between them?
  - (e) How many user-level processes are in the system?
  - (f) How many context switches have the system performed since bootup?
  - (g) What is the size of files in the **/proc** directory?
2. Run all programs in the subdirectory **memory** and identify the memory usage of each program. Compare the memory usage of these programs in terms of **VmSize** and **VmRSS** and justify your results based on the code.
3. Run the executable **subprocesses** provided in the sub-directory **subprocess** and provide your roll number as a command line argument. Find the number of sub processes created by this program. Describe how you obtained the answer.
4. Run **strace** along with the binary program of **empty.c** given in subdirectory **strace**. What do you think the output of **strace** indicates in this case? How many different (system call) functions do you see?  
Next, use **strace** along with another binary program of **hello.c** (which is in the same directory). Compare the two **strace** outputs,
  - (a) Which part of the **strace** output is common, and which part has to do with the specific program?
  - (b) List all unique system call functions for each program and look up the functionality of each.
5. Run the executable **openfiles** in subdirectory **files**. List the files which are opened by this program, and describe how you obtained the answer.
6. Find all the block devices on your system, their mount points and the file systems present on them. A mount point is a file system directory entry from where a disk can be accessed. A file system describes how data is organized on a disk. Describe how you obtained the answer.