BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE PILANI,
K. K. BIRLA GOA CAMPUS, I SEMESTER 2023-2024
Operating Systems (CS F372)
Component: Lab #3 Due Date: 13/09/2023, Time: 11:59 P.M

Problem statement:

Write a new System Call in Kernel space which takes 2 arguments (A) Process ID (pid) and (B) User Option (opt) as input:

Argument #1: pid: A positive integer
Argument #2: opt: A positive integer with following values:

- **0:** returns the total memory used by the process; i.e., physical memory, swapped memory, etc.
- **1:**returns the amount of physical memory used by the process.
- **2:** returns the memory stats [of the system] in KB
- **3:** returns the memory stats [of the system] in %

Unacceptable values of Arguments should give distinct errors.
The system call would be used in a program as:

```
Unsigned int ret = syscall (SYSCALL_NUM, pid, opt);
```

Write a user program to use the system call to print the corresponding value based on arguments. The executable should take 2 command line arguments [first one as pid and second one as opt].

Hint:

Structs

The memory values are contained in the sysinfo structure that is available in [include/linux/sysinfo.h]
The CPU utilization can be found in [include/linux/kernel_stat.h]
Information for a particular process can be found in the task_struct in the [include/linux/sched.h]

Macros

[include/linux/sched/signal.h] may contain macros that might be useful.

Note: What to submit?

<Your IDNo>_Lab3.tar.gz file containing the following:

- User space driver.c, wrapper.c, header.h and makefile.
- Kernel space all the files you created new and you modified [Please don't submit the image file].
- A document containing screenshot of each step you executed [with its result]. The screenshot of your program executing various test cases also should be included as part of the document.

EndNote: