Operating Systems

Assignment : Character Device Driver

Objective:

Create a Character Device Driver with the following functionality:

1. Kernel Version Check:
   - The driver must accept an array parameter called kernel_version, which specifies the current kernel version.
   - The driver should only be inserted if the provided kernel version matches the version used to compile the module.
   - For example, if the module was compiled for version 6.5.1, it should only be successfully inserted if you run

     ```
     insmod <your_driver_name>.ko kernel_version=6,5,1
     ```

2. Driver Insertion:

   Upon successful insertion, the driver should print the assigned major and minor numbers in the kernel log (this can be checked using the dmesg command).

3. Device Read/Write Operations:

   After insertion, you should write <FIRSTNAME>_<ROLLNO> to the device and read from it in two different ways:

   1. using the 'echo' command for writing and the 'cat' command for reading.
      eg:

      ```
      > echo "RAMESH_B220007CS" > /dev/<device_name>
      > cat /dev/<device_name>
      RAMESH_B220007CS
      ```

   2. using a user program written in C or any other language.

   Whenever the read and write functions of the driver are called, appropriate messages should be printed in the kernel log (e.g., Read function called! or Write function called!).

Instructions:

- Submit a PDF report containing the following:
  - Problem Statement
  - Methodology
  - Detailed Explanation (with screenshots)

The report should be submitted individually.

- Include the source code (of both the device driver and the user program) and a README file explaining the execution process.
- Compress all files into a folder with the name format <FIRST-NAME>_<ROLLNO>.rar.