Faculty of Engineering

Department of Computer Engineering

CMPE 431 – OPERATING SYSTEMS

Homework 2

Academic Year: Spring 2019-2020
Date: **28.04.2020**
Due Date: **04.05.2020**
Instructor: Assoc. Prof. Dr. Hürevren KILIÇ
Lab Assistants: Res. Asst. Ersin TİRYAKİ, Res. Asst. İbrahim TARAKCI

- Note: You need to make a **zip file (name_surname_SID_hw2)** which incudes your Terminal history, C code file, and dmesg messages screen shots; then you need to upload this file to Moodle until 23:59 04.05.2020.
- Group study is not allowed. Everyone do his/her homework as an individual.
- **Late homework will NOT be graded.**
- Cheating will NOT be tolerated. If any case of cheating is detected, at any time, **you will get ZERO from your homework.**

In this assignment, you need to write a **kernel** module named **xyz** that **lists current** processes/tasks in a Linux system based on given selection criteria. Remember that the **Process Control Block** (PCB) in Linux is represented by the structure `task_struct`, which is found in the `<linux/sched.h>` include file. In your code, you are required to **iterate over** all the current processes in the system using a **Depth-First Search (DFS)** tree. Also, use `list_for_each(…)` **macro** in your solution in order to **direct** your **DFS**.

Your code output should **appear** in the **kernel log** buffer that can be viewed by using the `dmesg` command. **Verify** your code by comparing the contents of the kernel log buffer with the output of the following command `ps -eLf` that lists **all processes including threads** in the system.

i. **Print name** and **ID** of **all** current **processes** in the system. (**25 pts.**)
ii. **Print** information about of the **processes** into the **kernel log** that fits to below **queries**
    a. What are the **name**, **ID** and **priority** value of the **processes** having **ID < 100** ? (**25 pts.**)

b. If the process named “**gedit**” exist in the system, what is its **parent process name** and **ID** ? (**25 pts.**)
c. What are the **name** and **ID** of the **processes** whose states are **runnable** ? (**25 pts.**)