National University of Computer and Emerging Sciences

Laboratory Manual # 04
Operating Systems

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Section	BCS-4E
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Instructions:
- Submit a world/LibreOffice file containing screenshots of terminal commands/ Output
- Submit your .c (Code files)
- In case of any explanation you can add a multiline comment.

Objectives:
- Working with Linux system calls Fork and exec
- Inter process communication through pipes

Reading material:
https://docs.google.com/document/d/1OvZZ-MAkXwX8xKyqZh4ay4uPhf_Q2yReEAwARfOOgAA/edit?usp=sharing

1. Exercise 1:   [10]

Write a program that uses fork() to create a child process. In the parent process, fork another child. The first child process should use exec() to run the ps command, while the second child should run the whoami command. The parent process should wait for both child processes to complete.

2. Exercise 2:   [10]

Write a program that uses two unnamed pipes to allow two-way communication between a parent and child process. The parent should send a message to the child, and the child should reply with a response. Both the parent and child should print the messages they send and receive.

3. Exercise 3:   [10]

Write a program where multiple child processes act as writers and the parent process acts as a reader using a named pipe (FIFO). Each child writes a message to the FIFO, and the parent reads and prints each message sequentially.