

National University of Computer and Emerging Sciences



Laboratory Manual # 05 Operating Systems

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Section	BCS-4E
Date	04-March-2025
Semester	Spring 25

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:

- Fork()
- Inter process communication through pipes
- Dup and Dup2 system call

Reading material:

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

1. Exercise:

[10]

Write a program that reads input from a file named input.txt, sums all the digits found in the file, and writes the result to a new file named output.txt. The program should use unnamed pipes for interprocess communication (IPC) between a parent process and a child process. The parent process will read the contents of input.txt and send the data to the child process through a pipe. The child process will calculate the sum of the digits and write the result to output.txt.

1. Use the dup2 system call to redirect standard input (stdin) and standard output (stdout) for file operations.
 - Redirect stdin to read from input.txt.
 - Redirect stdout to write to output.txt.
2. Use unnamed pipes for communication between the parent and child processes.
 - The parent process should read the file contents and send them to the child process through the pipe.
 - The child process should receive the data, calculate the sum of the digits, and write the result to output.txt.
 - [Note: You are allowed to fix the size of the array]
3. Include proper error handling for all file operations, system calls, and pipe operations.
4. Follow good coding standards, including meaningful variable names, comments (if necessary).

Example:

If input.txt contains the following data:

1 2 3 4 5

The program should calculate the sum as 15 and write this result to output.txt.