

National University of Computer and Emerging Sciences

Lahore Campus

Operating Systems Lab

Date: 18, 03, 2025

Instructor

M. Hashir

Sessional-I Exam

Total Time (H:M): 1:40

Total Marks: 60

Total Questions: 2

Semester: Spring-2025

Roll No

Section

Student Signature

Submission path: \\Exam\\Lab Submissions\\Muhammad Hashir Mohsineen\\OS BCS 4E\\Mid 1

Q. No 1:

[30]

Write a program to automate the compilation and execution of C programs (program name passed by command line arguments). The program should compile a C file using gcc and then execute the resulting binary.

The parent process creates processes to first execute gcc to compile the C file, and then it should execute the resulting binary. Redirect any errors during compilation to a file (errors.txt) using dup2().

```
dev@6838-CS:~/bcs4e$ nano automate.c
dev@6838-CS:~/bcs4e$ gcc -o automate automate.c
dev@6838-CS:~/bcs4e$ nano hello.c
dev@6838-CS:~/bcs4e$ ./automate hello.c
Compilation successful. Executing the binary...
Hello, World!
Execution completed.
dev@6838-CS:~/bcs4e$
dev@6838-CS:~/bcs4e$
dev@6838-CS:~/bcs4e$ ./automate hello4.c
Compilation failed. Check errors.txt for details.
dev@6838-CS:~/bcs4e$ ls
a.out  automate  automate.c  errors.txt  hello.c
dev@6838-CS:~/bcs4e$ nano errors.txt
dev@6838-CS:~/bcs4e$ cat errors.txt
cc1: fatal error: hello4.c: No such file or directory
compilation terminated.
dev@6838-CS:~/bcs4e$
```

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Q. No 2:

[30]

Write a program to build a multi-threaded file processing system where one thread reads lines from a file and sends them to another thread for processing (e.g., converting to uppercase).

Program should use named pipes and threads to implement this system. The first thread should read lines from a file and write them to a named pipe. The second thread should read the lines from the named pipe, convert them to uppercase, and print the result. You can use a sleep system call if needed (for delay).

[toupper(ch) the function returns its corresponding uppercase character]

```
dev@6838-CS:~/bcs4e$ cat input.txt
hello world
this is a test
named pipes are useful
dev@6838-CS:~/bcs4e$ gcc -o file_p file_processor.c
dev@6838-CS:~/bcs4e$ ./file_p input.txt
Processed: HELLO WORLD
Processed: THIS IS A TEST
Processed: NAMED PIPES ARE USEFUL
dev@6838-CS:~/bcs4e$ _
```