Task 1 [10 minutes]

Write a C/C++ program that uses the execl function to execute the "ls" command to list the files in the current directory. Handle any errors that occur during the execution and print an appropriate error message.

Task 2 [15 minutes]

Write a program that receives two command line arguments: the name of text files. Your program will work as follows:

- Start out by spawning a child process.
- The child process calls **exec** to run another program (which simply prints hello world on screen).
- The parent process calls **wait** so that it blocks until the child terminates and passes back its termination status.
- If the child process terminates without error, the parent spawns another child and, again, calls **wait** so that it can block until the child terminates.
- The new child calls **exec** again, but this time it runs on the arguments that the parent received from the command line and copies the content of first file to the second file.
- Once the parent learns that the child has terminated, it goes on to terminate also.

Task 3 [20 minutes]

Develop a C/C++ program that opens a file, and then create a child process. In the child process, use exec to execute another program. Investigate whether the child process can still access the file opened by the parent and explain the results.

Task 4 [25 minutes]

Develop a C/C++ program that uses multiple child processes to execute different programs concurrently. Use the exec functions to replace each child process with a different program.

Task 5 [25 minutes]

Create a C/C++ program that demonstrates how to pass environment variables to a new program using the execle function. Print the environment variables in the child program.

Task 6 [25 minutes]

Write a C/C++ program that uses the exec family of functions to execute external commands in a cross-platform manner, ensuring compatibility between Unix-like systems and Windows.

Hint:

You can use chatGPT in this task. The marking of this question will be on viva/demo of the answer that you will submit.