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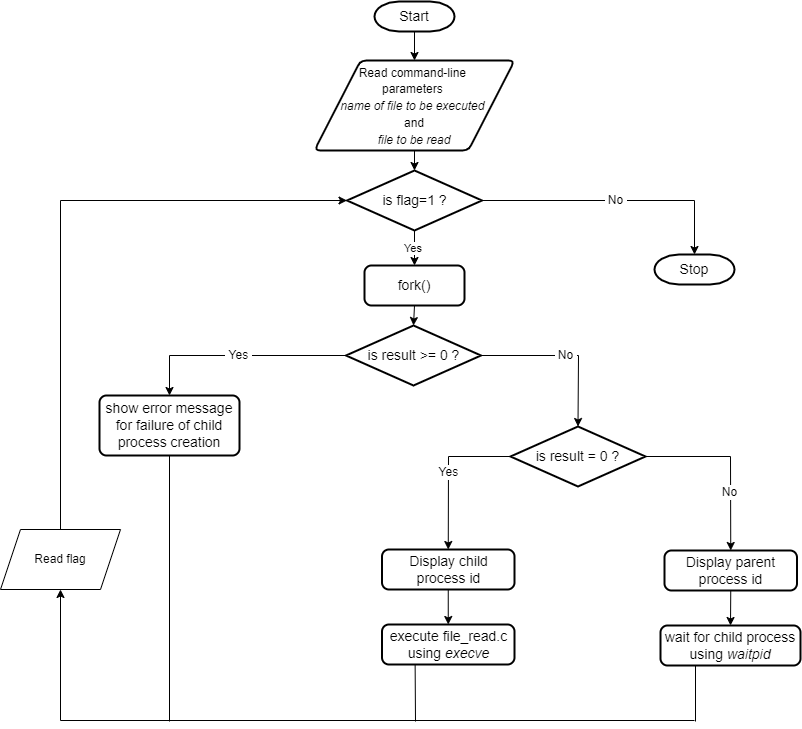
Programming Assignment 1

**DESIGN DOCUMENT**

# INTRODUCTION

The program is an implementation of the code snippet mentioned in Fig 1-19 of the book Modern Operating Systems by Andrew Tanenbaum that illustrates the working of *fork*, *waitpid* and *execve* function calls.

# HIGH-LEVEL DESIGN



# BUILDING THE PROGRAM

There are three files required to run the program namely:

1. program1.c
2. file\_read.c
3. input.txt

The files are present in the folder named “*Code Files*”.

To compile the program, run the below commands:

gcc program1.c -o program1

gcc file\_read.c -o file\_read

# PROGRAM EXECUTION

To execute the program, run exactly the following command:

./program1 file\_read input.txt

In the above command, *program1* is the name of the executable and the remaining two items are command-line arguments. *file\_read* is the name of the executable that is run by execve command and *input.txt* is the file to be read.

# VERIFICATION OF PROGRAM

The correctness of the program can be evaluated by checking if it demonstrates the working of the code snippet in Fig 1-19, where the shell first reads from the terminal the operation to be performed, creates a child process by fork call, and executes the tasks according to the result of the fork call. If the result of the fork call is 0 (child process context), it runs the execve call. If it is greater than 0 (parent process context), it waits for the child process to complete.

Likewise, the implemented program first reads the parameters indicating the operation to be performed(name of an executable) and the name of the file to perform the operation on. It then creates a child process by fork call. If result=0, it runs the executable through execve call, and if the result>0, it waits for the child process indicating that the parent process waited for the child process to complete its execution. The entire logic can be repeated or stopped by means of a flag variable.

# TERMINATING THE PROGRAM

To terminate the program, press any numeric key other than “1”.