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CSE344 System Programming HW2 Report

Program

In program, it reads the “input” file in P1(parent process) 20 by 20 bytes and it process the bytes with least square method in critical section then writes the processed data(estimated equation) in temp file that created by mkstemp this way: (x_1,x_1), (x_2,y_2), ..,(x_10,y_10), ax+b. While writing the P1 process to the temp file, P2(child process) will read them and calculate the errors in critical section and write them to the output file this way: . (x_1,x_1), (x_2,y_2), ..,(x_10,y_10), ax+b, MAE, MSE, RMSE.

Program’s functions

write_lock(...): It runs like a normal write system call but this function also provides write lock and unlock by using flock structure. So I use this function everywhere instead of write.

read_lock(...): It runs like a normal read system call but this function also provides read lock and unlock by using flock structure. So I use this function everywhere instead of read.

read_line(...): Reads line after the given offset and if remove_line parameter is 1 then deletes the determined line with the algorithm that saves back the all characters from the line after the line to delete until the file is finished along the length of the line.

(Handler function) single_array_catcher(...): Saves the signal that caught in least_square_method function critical section in the signal array.

least_square_method(...): Finds the coordinates using the given 20 byte char pointer value as parameter and finds an equation by applying the least square method using these coordinates. Then it turns it all into a string and prints it.

standart_dev(…): Calculates the standart deviation by dividing N.

mean_errors(…): It separates the string containing the coordinates and the equation given as parameters into its tokens and then calculates the errors with this data. At the end of the function, it adds errors to the string that came as input and returns it as a new string.

(P1's main function) read_input_file(…): Reads the input file and process by using "least_square_method(...)" and writes the processed data in temp file.

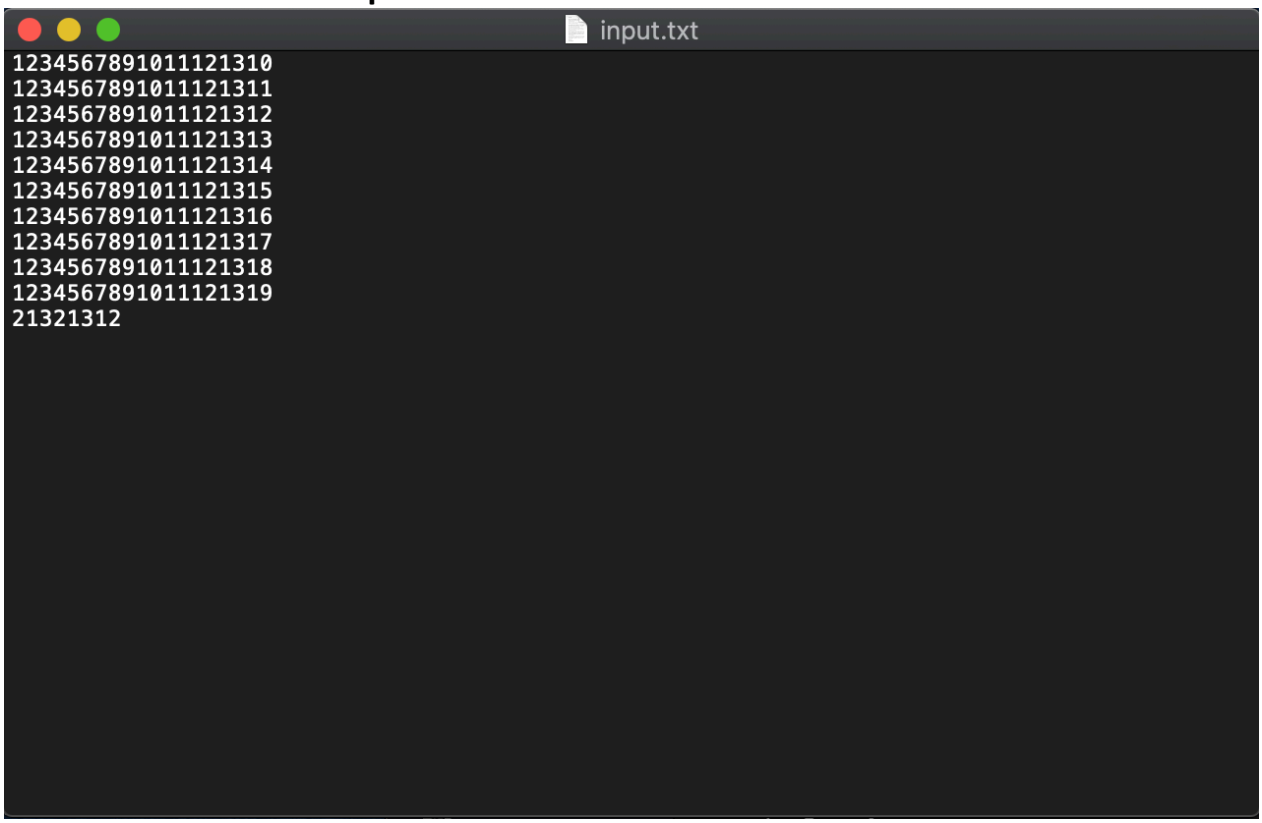
(P2's main function) read_temp_file(…): Reads the temp file and process by using "mean_errors(…)" and writes the processed data in output file.

(Handler function) catcher(…): main() function's catcher. Catches the SIGTERM, SIGUSR1, SIGUSR2.

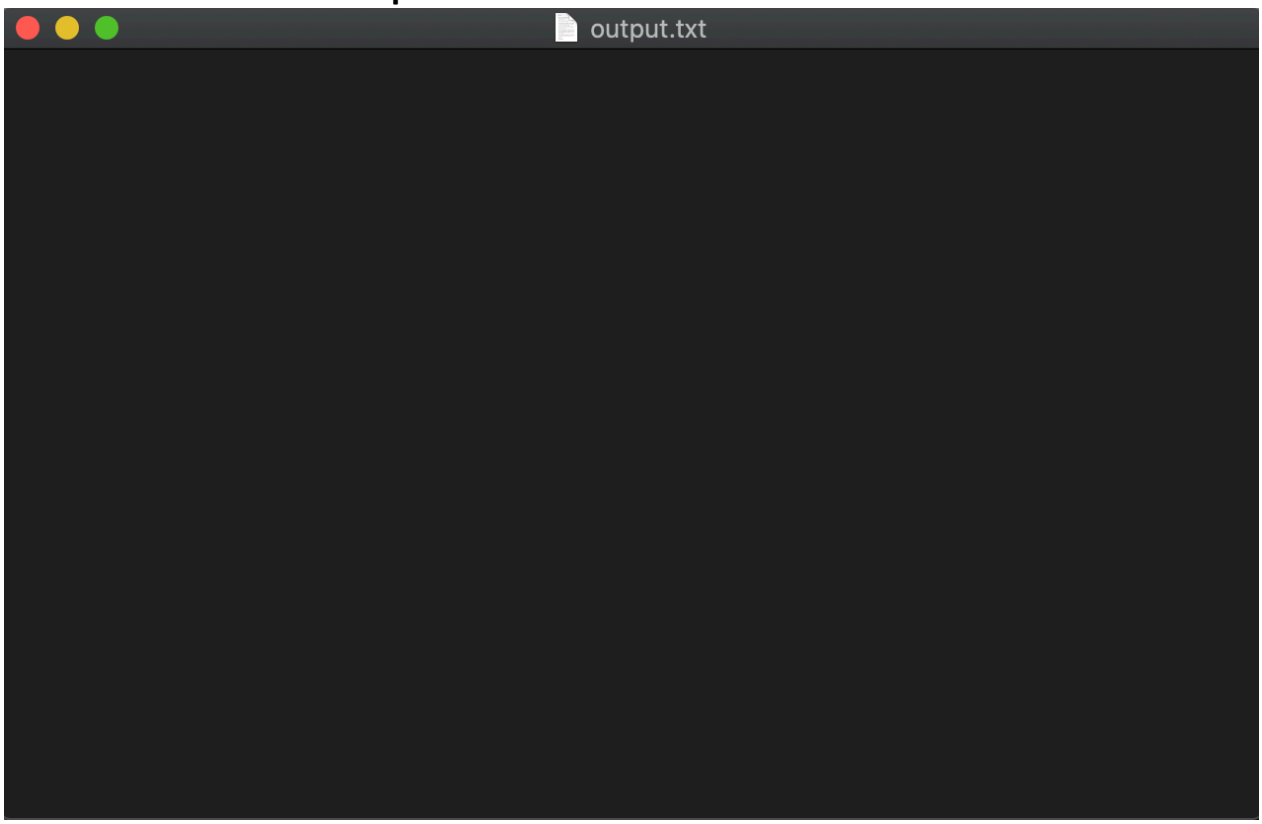
main(): It forks the main process and creates two separate processes. Expects a readable value from the child process parent from the processes. When the signal (SIGUSR2) comes from the parent, it understands that it is a readable value and continues. Also, the child waits for the signal from the parent to terminate the process (SIGUSR1), and deletes the files.

Sample Execution Screenshots

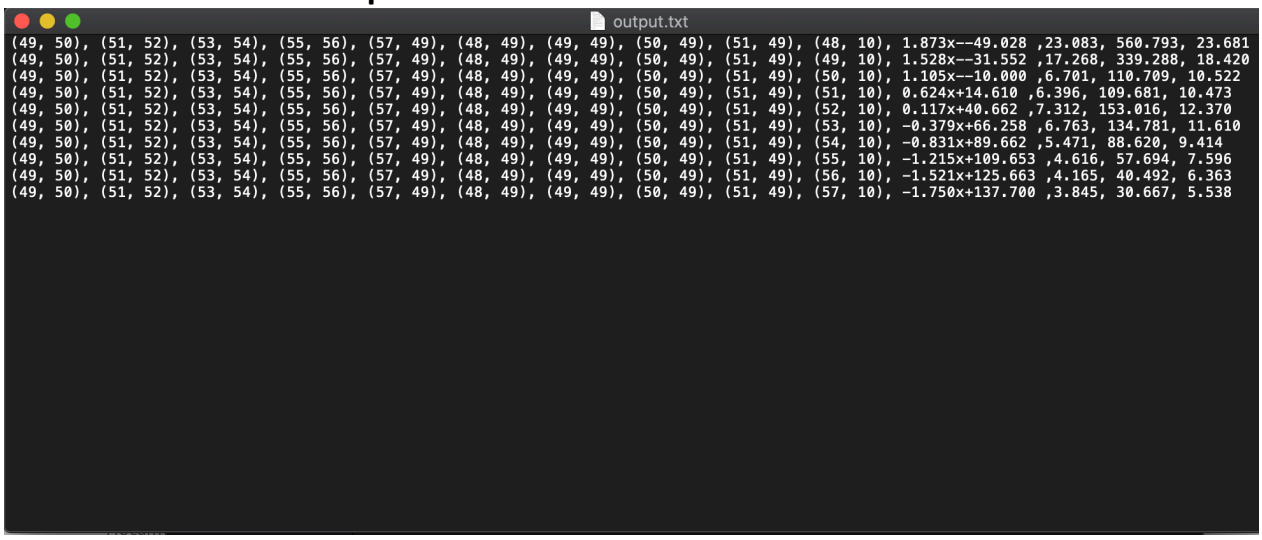
Before the execution input file:



Before the execution output file:



After the execution output file:



After the execution terminal: