CSE 102 Spring 2025 – Computer Programming Assignment 8

Due on May 4, 2025 at 23:59

In this assignment, you have an input file named input.txt. The first line of the input file contains a random set of numbers, and the number of integers in this set can be 3, 6, or 9. The other 3 lines each consist of a random set of numbers, with the number of integers in these lines being the same size, and it can be 20, 50, or 80. You have a stack data structure with a size of 3. You will get inputs from the user with two different options: “max” and “avg,” and you will store these operation names in the stack. Afterward, take input from the user with one of the following options: “rgb,” “bgr,” or “gray.” You will slide chunks over the numbers in the other lines and apply the user-selected operations (“max” or “avg”). The rule for “max” is to multiply each chunk by the corresponding numbers in the selected lines and take the maximum value from the result. For “avg,” the same process applies, but instead of the maximum, you will calculate the average of the results, so you will get a single number from the operations. After collecting the resulting numbers, “rgb”, “bgr” or “gray” enum values(enum Color color), write the results to the output file (output.txt) according to these rules:

rgb -> [second_line_results, third_line_results, fourth_line_results], [second_line_results, third_line_results, fourth_line_results]... etc.

bgr -> [fourth_line_results, third_line_results, second_line_results], [fourth_line_results, third_line_results, second_line_results]... etc.

gray-> [second_line_results]

[third_line_results]

[fourth_line_results]

You will implement these functions:

int max_operation(int* chunk, int* corresponding_chunk_part, int chunk_size);
//corresponding_chunk_part does not have to be the same length as the chunk.

int avg_operation(int* chunk, int* corresponding_chunk_part, int chunk_size);

void print_output_file(int* chunk, int* line, int chunk_size, int (*operation)(int*, int*, int), int line_size, …);

Scenario Visualization:

example of input.txt:

operations input = ‘max’, ‘avg’, ’avg’ Apply

1,7,3,40,5,61,7,22,9

15,21,12,28,389,24,34,64,88,58,25,4,67,81,97,32,72,74,71,150 avg

54, 23, 98, 47, 83, 15, 67, 29, 71, 36, 90, 59, 19, 41, 72, 12, 61, 4, 82, 11 avg

37, 92, 56, 14, 75, 63, 8, 21, 66, 39, 89, 50, 27, 48, 70, 9, 84, 28, 45, 3 max

15	21	12	28	300	24	.....	.....	88	58	25
1	7	3								
	1	7	3							
		1	7	3						
			...	...	....	....				
								1	7	3

You will slide chunks as shown above on lines.

max operation -> (15*1, 21*7, 12*3) => 147

avg operation -> (15*1, 21*7, 12*3) => 66

example of output.txt:

for example: if calculated results are :

1,2,3,4,5,6,7,8,9,....
10,20,30,40,50,60,70,80,90,....
22,45,85,29,17,40,56,48,72,80,....

output.txt content format must be:

RGB : -> [1,10,22],[2,20,45],[3,30,85],[4,40,29],....

BGR: -> [22,10,1],[45,20,2],[85,30,3],[29,40,4],....

GRAY: -> [1,2,3,4,5,6,7,8,9,...]

[10,20,30,40,50,60,70,80,90,...]

[17,22,29,40,45,48,56,72,80,85,...]

Hint: You can use a temporary file to store calculated results.

IMPORTANT NOTES:

- Submit your homework as a zip file named as your student id (StudentID.zip) and this file should include:
  - YourStudentID.c file
  - A report containing screenshots of running code and generated outputs.
- Programs with compilation errors will get 0.
- The output format must be as given, do not change it.
- Compile your work with the given command “gcc --ansi your_program.c -o your_program”.
- For any questions and problems, you can always contact me via email zelihaerim@gtu.edu.tr.