CSE108 – Computer Programming Lab.

Lab 7

Loop, Functions, File Operations

Due 28/04/2023 at 10am.

Hand in: A student with number 20180000001 should hand in a zip file named 20180000001.zip for this lab.

Part 1. (40 pts) You need to get a string **s** containing lowercase letters of varying sizes from the user in the main function. You are allowed to perform the following operation any number of times: Choose any substring of **s** that consists of the same character and remove it from **s**. For example, if **s** is "aabccccaaa", you can remove the substring "ccccc" to get "aabaaa", or you can remove the substring "aaa" to get "aabccccc".

Write a C function to find the minimum number of operations required to get an empty string. For example, if **s** is "aabccccaaa", the answer is 3 with the following sequence of operations:

- Delete "ccccc" to get "aabaaa"
- Delete "b" to get "aaaaa"
- Delete "a" to get the empty string

Part 2. (40 pts) You need to get a string **s** containing words separated by spaces. You also need a rule to filter the string. The rule is a string that may contain letters, ***** (match any sequence of characters) or **?** (match any single character) wildcards. If any word in **s** matches the rule, then the word is deleted from the string.

Write a C function that takes both **s** and **rule** strings as inputs and returns the filtered text. For example, if **s** is "As a noble person, I want to solve this novel problem on my own." and **rule** is "o*e", the filtered text is "As a person, I want to this on my own.". Moreover, if the **rule** is "no?el", the filtered text is "As a person, I want to solve this problem on my own."

Part 3. (20 pts) In this question, you need to get an integer array of varying sizes from the user in a function. Then, pass that integer array to another function that finds the minimum and maximum items of the given array and prints them. The function also takes the number of items in the array as input. **In this function, you are not allowed to use any extra variables. Moreover, any other loop is allowed except the one given in the function template below.**

```
void foo_min_max(int arr[], int n)
{
	for (int i = 0; i < n; i++)
	{
	}
}
```

General Rules:

1. You will have two hours to provide a solution to the given problem set. You are not permitted to ask any questions. If there is a significant error in the assigned tasks, it will be addressed later.
2. You will be able to hand in your solutions via Teams in the next two hours. The submission will be closed exactly at 10am.
3. There will be an interview session immediately after the submission deadline. Starting at 10am, you will be randomly invited to attend a meeting by a TA to demonstrate your solution and answer any questions asked by the TA.
4. You must be available until 1pm to respond to the demo invitation whenever you receive it. You will have 3 minutes after you are called via Teams. If you do not answer/appear in 3 minutes, you will miss you interview.
5. If you miss your interview or are unable to give satisfactory answers to the questions, you will receive a zero for that lab even if you have submitted your solution.
6. If you have not submitted a solution in time, you will not be invited for the interview and receive zero for that lab.
7. Due to time constraints, some students may not be invited to an interview. In that case, their solutions will be graded offline.
8. Unless you aren't declared for a specific prototype, you may use arbitrary but proper function and variable names that evoke its functionality.
9. The solution must be developed on given version of OS and must be compiled with GCC compiler, any problem which rises due to using another OS or compiler won't be tolerated.
10. Note that if any part of your program is not working as expected, then you can get zero from the related part, even it is working partially.
11. Zip your solution file before uploading it to MS Teams. The zip file must contain the C file with your solution and screenshots of the valid outputs of the program.