**PROGRAMMING ASSIGNMENT 4**

Write your responses to parts 2 and 4 in the ‘Programming Assignment Documentation Template’ found in ManageBac. Make sure to include your name and the programming assignment number. Your code can be uploaded alongside the accompanying word document.

PART 1: PROBLEM STATEMENT

I run a software company with lots of clients that log into my web program. Each of these users has an email address and a password on file with the company that they use to log in with. Unfortunately, our previous system wasn’t quite as robust as it should have been, and we didn’t force users to generate safe passwords.

What we need you to do is to go through our list, containing all of our customers’ login info, in a .txt file called PA 4-4.txt, and identify which customers need to update their passwords. When you’ve done this, store those customers’ email addresses in a new .txt file called updateEmails.txt, that will only contain the emails of customers who need to update their passwords.

Passwords that don’t meet the following criteria should have their owners’ emails added to the list.

* One uppercase and one lowercase letter
* One number
* One special character
* At least 8 characters in length

Our PA 4-4.txt file looks like this for an arbitrary number of lines

Testemail@test.com,Password123!

NextTestEmail@test.com,passwordthatisn’tuptostandard

Joe.Toe.Moe@test.com,passWordTh@tme3tsStandards

…

PART 2: BRAINSTORMING THE ALGORITHM

Before you jump into writing any code, jot down your thought process. Think about what procedures you might want to split your code into to accomplish this goal, and jot those down here.

This program makes use of loops, file I/O, and string methods. We have covered loops and file I/O extensively, but certain string methods may be unknown to you. You may need to do research to find out how to determine if a string (password) contains a lowercase letter, or how to split the email address and the password apart. This is okay but link the sources that helped you do this in Part 4 below.

Do this step in the ‘Programming Assignment Documentation Template’ found in ManageBac.

PART 3: WRITE THE PROGRAM

Write your code in a replit project, or VS Code .py file, whichever is easiest.

Your code doesn’t need to output anything to the terminal, but if you’d like it to for your own testing purposes you can feel free to.

Example input text and output file text are provided below.

Input: PA 4-4.txt

A screen shot of a computer

Description automatically generated

Output: updateEmails.txt

A screen shot of a computer

Description automatically generated

PART 4: REFLECTION

Answer the following questions in the ‘Programming Assignment Documentation Template’ found in ManageBac.

1. What new tools did you have to use to accomplish this task? How did you split the input string into username and password and determine if each password had the necessary components? Here, you may also link any sources used to write the code.
2. What consequences are there to having a shorter password with fewer special characters? You may research this question to help you answer.

Using this link: [Password Tester | Test Your Password Strength | Bitwarden](https://bitwarden.com/password-strength/#Password-Strength-Testing-Tool), answer the following questions:

1. In your testing, what would make the password strength weaker? List a few traits.
2. In your testing, what would make the password strength stronger? List a few traits.
3. Take a glance at the first few paragraphs of this article: [zxcvbn: realistic password strength estimation - Dropbox](https://dropbox.tech/security/zxcvbn-realistic-password-strength-estimation). The author created the tool we tested some passwords against for the last few questions. He explains that many of our common password tendencies just make it trickier to remember and not truly make them any more secure, despite websites saying so. With all of this said, do you think the changes that our company is requiring its users to make to their passwords are valid, either partially or at all?