Programming 1– (CC271)

Final Project

Company Management System

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1. INTRODUCTION

This program aims to create a fully functional company management system for employees that can add, delete, modify, sort, print, and save employees' data using structs, arrays, and file functions. The program is protected using a password system. This report contains a user manual, a description that contains a brief of how every function in the program works.

2. USER MANUAL

Steps to operate the program:

- Open the .exe file.
- Enter the default password "1234".

```
Welcome to the employees' database for the first time

Please note that the default password = 1234

Please enter the password to access the database: 1234
```

- If the data file doesn't exist:

```
Error... file not found

You can only add employees
```

1. Press 2 to create a data file that contains the employees' data
2. After the adding step, you should save the changes you made in the data file by pressing 6 to save the changes.

- If the data file exists, you can apply any of the following operations to it:

```
Welcome to the employees' database for the first time

Please note that the default password = 1234

Please enter the password to access the database: 1234

Correct password ... Access granted


Loading complete...

Welcome to the employees database

Here are the operations you can do:-

1-Search for an employee
2-Add an employee
3-Delete an employee
4-Modify an employee's data
5-Sort and print data of all employees
6-Save changes made
7-Quit
8-Change password

Enter the number of the operation you want to perform:
```

1. Press 1 to search for an employee using his last name.
2. Press 2 to add data for the desired number of employees.
3. Press 3 to delete the desired number of employees using their first and last names.
4. Press 4 to modify the data of existing employees using their ID.
5. Press 5 to sort and print the data of all employees.
6. Press 8 to change the password for the program (it should be at least 8 characters, contains at least 1 uppercase character, 1 lowercase character, 1 number, and 1 special character).

- Press 6 to save the changes without exiting the program.

- Press 7 to exit the program.
    1. If the changes are already saved the program will exit directly.
    2. If the program isn't saved it will provide 2 options:
        - Exit without saving
        - Save and exit.

```
Enter the number of the operation you want to perform: 7
Are you sure you want to exit without saving
1-Exit        2-Save and exit
2

Saving complete...


Quitting

Process returned 0 (0x0)   execution time : 300.526 s
Press any key to continue.
```

3. DESCRIPTION

3.1 Load Function (load)

This function is used to read the content of the .txt file if the file exists, if it doesn't it creates a new file. The function reads the data in the following order: ID, last name, first name, salary, birth date, address, phone number, and then the e-mail.

This function is called by default after entering the right password.

```
Please enter the password to access the database: aBcD123@

Correct password ... Access granted


Loading complete...
```

3.2 Password Function (password)

This function asks the user to enter the program's password to access the database.

If the user is using the system for the first time he should enter the default password "1234"

3.3 Check Password (chkpass)

This function checks if the password is at least 8 characters, contains at least 1 uppercase character, 1 lowercase character, 1 number, and 1 special character.

3.4 Change Password (change_password)

This function allows the user to change the password as long as it meets the conditions in "chkpass".

```
Enter the number of the operation you want to perform: 8
Please enter the old password: 1234
Please enter the new password
(must contain numbers, alphabets in both cases and special characters at least 8 characters): aBcD123@

Password changed successfully

Please enter the password to access the database:
```

3.5 Check Number (chkNumber)

This function checks if its input is an integer (must contain digits from 0 to 9).

In given example, the user tries to enter an ID but he enters letters other than numbers.

```
enter the ID of employee 12: abc
enter a proper ID:
```

3.6 Check E-mail (chkmail)

This function checks if the e-mail contains just one '@', it also checks if there is at least one character before and after the '@' symbol, finally it checks if the e-mail has at least one '.'

```
enter the e-mail of employee 12: ahmed
enter a proper e-mail: ahmed@
enter a proper e-mail: ahmed@gmail.com
```

3.7 Check Name (chkName)

This function checks if its input is just letters and hyphens (no numbers or special characters other than hyphens).

```
enter the last name of employee 10: 123ah
enter a proper last name: @$dfa
enter a proper last name: ahmed
enter the first name of employee 10:
```

3.8 Check ID (chkID)

This function checks if the entered ID is already taken or not when adding new employees or modifying employees' data.

```
enter the ID of employee 10: 5
This ID is already taken please enter another ID:
```

3.9 Search Function (search)

This function is used in searching for users in the database using their last name. And the algorithm used in the search is:

1. First, we get the last name from the user to search for the employee.
2. Then run through the database comparing that last name with all the last names in the database.
3. If it found more than one employee with the same last name it prints all their data for the user.
4. If it didn't find any matching for that last name it prints to the user that there is no employee with that last name in the database.

```
Enter the number of the operation you want to perform: 1
Enter last name: adam

Employee's ID: 8
Employee's last name: Adam
Employee's first name: Mark
Employee's salary: 333.30
Employee's date of birth: 10-4-1988
Employee's address: 23 sip Ave #410w
Employee's phone: 01232165564
Employee's E-mail: mjason@gmail.com


Employee's ID: 10
Employee's last name: Adam
Employee's first name: Mark
Employee's salary: 333.30
Employee's date of birth: 12-10-1990
Employee's address: 48 washington ave chelsea ma
Employee's phone: 01231213588
Employee's E-mail: mmcquade@icloud.com


Press any key to continue . . .
```

3.10 Enter Function (enter)

This function is used to take the data of the employees from the user and validate the data using check functions chkName, chkemail, chkNumber, chkFloat.

3.11 Add Function (add)

This function asks the user for the number of employees they want to add then add them to the database calling the enter function.

```
Enter the number of the operation you want to perform: 2
How many employees you want to add: 1
enter the ID of employee 11: 11
enter the last name of employee 11: hani
enter the first name of employee 11: ahmed
enter the salary of employee 11: 1500.5
enter the day of birth of employee 11: 9
enter the month of birth of employee 11: 6
enter the year of birth of employee 11: 2002
enter the address of employee 11: 172 el geish road
enter the phone number of employee 11: 01013391488
enter the e-mail of employee 11: ahanyahmed2002@gmail.com

Added successfully...

Press any key to continue . . .
```

3.12 Delete Function (delete_employee)

This function asks the user for the first name and last name of the employee to delete it from the database and if there is no matching for the first and last name it prints to the user that there is no employee with that name in the database.

```
Enter the number of the operation you want to perform: 3
Enter the last name of the employee: graves
Enter the first name of the employee: daniel

Deleted successfully...

Press any key to continue . . .
```

3.13 Modify Function (modify)

This function asks the user for the number of employees they want to modify their data using their IDs after it finds an ID it calls the function enter to let the user enter the new data if the program didn't find a matching ID it print to the user that there is no employee with that ID in the database.

```
Enter the number of the operation you want to perform: 4
Enter number of employees you want to modify: 1
Enter ID of employee you want to modify: 3
enter the ID of employee 3: 15
enter the last name of employee 3: ramadan
enter the first name of employee 3: mohamed
enter the salary of employee 3: 5000.25
enter the day of birth of employee 3: 16
enter the month of birth of employee 3: 3
enter the year of birth of employee 3: 2003
enter the address of employee 3: 17 port said sporting
enter the phone number of employee 3: 01212121212
enter the e-mail of employee 3: ramadan@gmail.com

Modified successfully

Press any key to continue . . .
```

3.14 Sort Function (sort)

This function asks the user how he wants to sort the employees and lets him sort employees by salary, last name, or date of birth.
It calls 3 other functions to sort data (sort by the alphabetic order of last name, sort by salary, and sort by date of birth) then it calls the function print to print the sorted data.

Algorithm:-

1. We create a dummy variable to store the data of employee 1 temporary
2. Then we switch the data of employee 1 and employee 2 the one after it
3. At the end we store the temporary data in employee 2
4. Repeat the steps above until whole database is sorted

```
Enter the number of the operation you want to perform: 5

1-Sort by last name
2-sort by date of birth
3-sort by salary
How do you want to sort the data: 3
```

3.15 Print Function (print)

This function is used to print the data of the employees to the user in both sort function and search function.

3.16 Save Function (save)

This function is used to save and store the data of all the employees in database and print it in the file.

If the user hasn't made any changes or has already saved a message is printed that no changes made to be saved.

3.17 Quit Function (quit)

This function simply quits the program but makes sure the user saved before exiting the program.

```
Enter the number of the operation you want to perform: 7
Are you sure you want to exit without saving
1-Exit        2-Save and exit
2

Saving complete...


Quitting

Process returned 0 (0x0)   execution time : 300.526 s
Press any key to continue.
```

3.18 Error function (error)

This function is called when the user enters invalid input.

It produces ring sound and the screen becomes red for 1 second.

3.19 Program Function (program)

This function is simply the main menu of the program where the user chooses which operation (function) he wants to perform on the database.

This function is called after the user successfully enters the right password.

```
Welcome to the employees' database for the first time

Please note that the default password = 1234

Please enter the password to access the database: 1234

Correct password ... Access granted


Loading complete...

Welcome to the employees database

Here are the operations you can do:-

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7-Quit
8-Change password

Enter the number of the operation you want to perform:
```

3.20 The main

The main in this program only calls one function then all functions call each other afterwards without any other codes in the main.

3.21 Global variables

3 global variables are used in this program:-

1- employees [1000] : array of structures that the data will be saved in.
2- save_state : this global variable is equal to one when changes are saved and it changes to zero when changes are still not saved
3- array : this global variable is the number of employees inside the system, it changes with increasing and decreasing employees.