Final programming project

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Project

Company Management System

Introduction:

In these project program (Company Management System of employees) the user can search or add, modify the information of employees or delete all information of employee or save or exit the changes and he can choose the operation he went to do, from the menu which show in the first in the program.

Manual of program:

The menu shows then user write number 1-7

----- MENU -----

1. ADD
2. DELETE
3. MODIFY
4. SEARCH
5. print
6. SAVE
7. QUIT

If the user chooses 1

---ADD ----

Enter ID, Id, full name, salary, birth date (day, month, year), the address, mobile number, date of enrolment(day, month, year), and email

If the user chooses 2

----- Delete -----

Enter Id, then it will delete all information of employees from the system

If the user choose3

----   Modify ----

Enter Id, and he can Modify: name, salary, mobile, address and email address of employees

If the user chooses 4

------ SEARCH -----

Enter part of the employee’s name, provide(show) all data for all employee, salary, birth date (day, month, year), the address, mobile number, date of enrollment, and email

If the user chooses 5

------   PRINT ----

Choose 1 -sort by name

2- sort by salary

3-sort by date of birth

If the user chooses 6

----   SAVE ---

Save the employees data(added or modified)

a warning message to the user about he want to exit or not

If the user chooses 7

---- QUIT ----

display a warning message to the user about all of changes will be discarded 1 unsaved 0 save.

Load Function:

This function is int type, does return a value.

The purpose of int function is to perform a task or set of tasks returning a value.

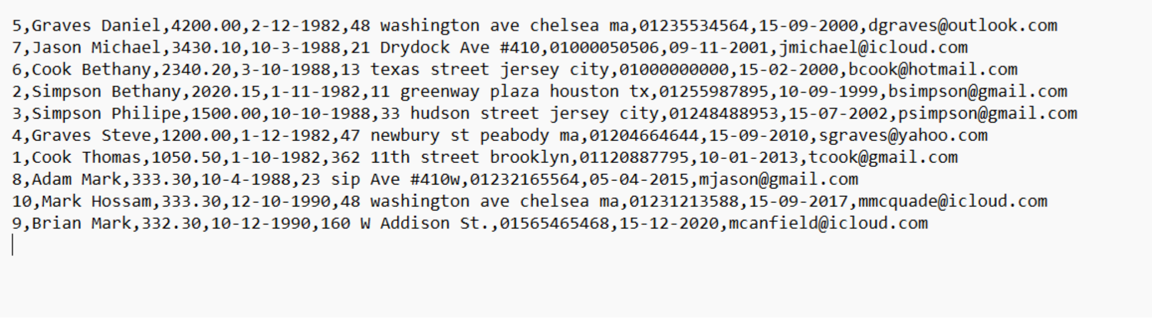
In Load function it takes from the user

- the file which contains the information of the employees.
- the employees in the form of array to store their data which is defined as struct.
- the employee count as a pointer to count the number of employees.

How does the load function work?

- FILE *file: Pointer to the input file.
- Employee employees [100]: Array to store employee data.
- int *employee Count: Counter for processed employees.
- The function uses a while loop along with fgets to read each line from the file.

- For each line, it employs the strtok function to tokenize the data based on commas. The parsed data is then assigned to the appropriate fields of the Employee structure.
- For each line read from the file, the function populates the Employee structure with the extracted information. Fields such as ID, full name, salary, date of birth, address, mobile number, and email are processed and stored in the array.



```
5,Graves Daniel,4200.00,2-12-1982,48 washington ave chelsea ma,01235534564,15-09-2000,dgraves@outlook.com
7,Jason Michael,3430.10,10-3-1988,21 Drydock Ave #410,01000050506,09-11-2001,jmichael@icloud.com
6,Cook Bethany,2340.20,3-10-1988,13 texas street jersey city,01000000000,15-02-2000,bcook@hotmail.com
2,Simpson Bethany,2020.15,1-11-1982,11 greenway plaza houston tx,01255987895,10-09-1999,bsimpson@gmail.com
3,Simpson Philipe,1500.00,10-10-1988,33 hudson street jersey city,01248488953,15-07-2002,psimpson@gmail.com
4,Graves Steve,1200.00,1-12-1982,47 newbury st peabody ma,01204664644,15-09-2010,sgraves@yahoo.com
1,Cook Thomas,1050.50,1-10-1982,362 11th street brooklyn,01120887795,10-01-2013,tcook@gmail.com
8,Adam Mark,333.30,10-4-1988,23 sip Ave #410w,01232165564,05-04-2015,mjason@gmail.com
10,Mark Hossam,333.30,12-10-1990,48 washington ave chelsea ma,01231213588,15-09-2017,mmcquade@icloud.com
9,Brian Mark,332.30,10-12-1990,160 W Addison St.,01565465468,15-12-2020,mcanfield@icloud.com
```

search Function:

This function is void type, does not return a value.

The purpose of void function is to perform a task or set of tasks without returning a value.

In search function it takes from the user:

- Name of employee if it's first name or second name (without space only single name)

How does the load function works?

Input:

Employee employees[]: An array of Employee structures.

int employee count: The number of employees in the array.

Purpose:

This function aims to search for an employee by name in the given array and print the details if a match is found

- User is prompted to enter a single name (without spaces).
- The entered name is then formatted using the FormatName function.
- Checks are performed to ensure that the name contains only alphabetic characters and a single space (for proper formatting).

Searching:

Iterates through the array of employees using a for loop.

For each employee, it checks if the entered name is a substring of the employee's full name using the strstr function.

Output:

If a match is found, it prints detailed information about the employee, including ID, name, salary, birth date, address, mobile, enrolment date, and email.

If no matches are found, it prints a message indicating that no matches were found.

//The use of strstr allows for partial matches, i.e., if the entered name is part of an employee's full name, it will still be considered a match.

2. int Validate_its_numbers(char number[])

Input:

char number []: A string to be validated.

Purpose:This function validates whether the provided string consists only of numerical characters (0-9).

Steps:

Character Validation:

Iterates through each character in the string using a for loop.

Checks if each character is a numerical character by ensuring it falls within the ASCII range for

(A-Z).

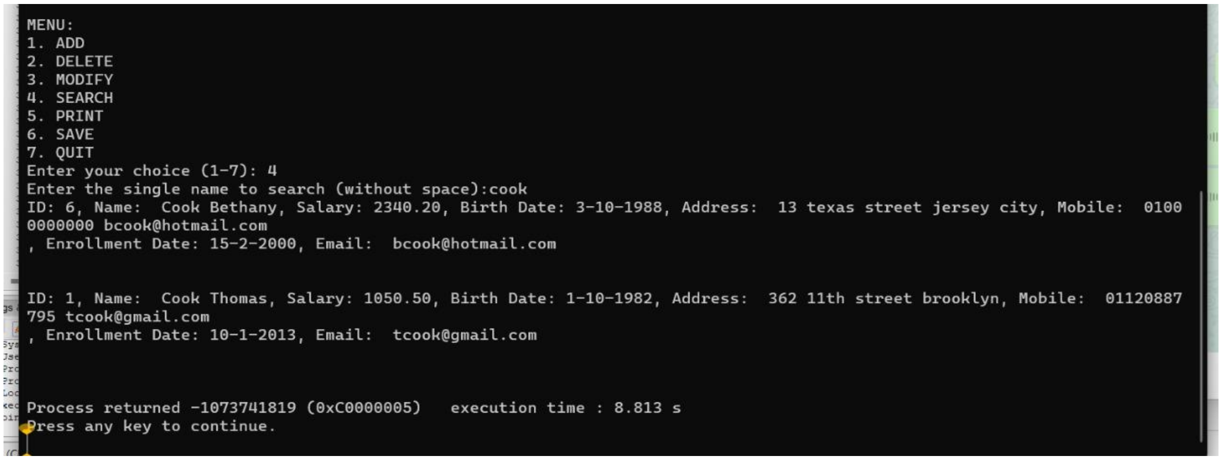
Error Handling:

If a non-numerical character is encountered, it prints an error message.

If all characters are numerical, it returns 0 to indicate no error.

Notes:

The function returns 1 if it encounters an invalid character, allowing the calling code to handle the error.



```
MENU:
1. ADD
2. DELETE
3. MODIFY
4. SEARCH
5. PRINT
6. SAVE
7. QUIT
Enter your choice (1-7): 4
Enter the single name to search (without space):cook
ID: 6, Name:  Cook Bethany, Salary: 2340.20, Birth Date: 3-10-1988, Address:  13 texas street jersey city, Mobile:  0100
0000000 bcook@hotmail.com
, Enrollment Date: 15-2-2000, Email:  bcook@hotmail.com


ID: 1, Name:  Cook Thomas, Salary: 1050.50, Birth Date: 1-10-1982, Address:  362 11th street brooklyn, Mobile:  01120887
795 tcook@gmail.com
, Enrollment Date: 10-1-2013, Email:  tcook@gmail.com



Process returned -1073741819 (0xC0000005)   execution time : 8.813 s
Press any key to continue.
```

<u>Add Function:</u>

Purpose: The Add function facilitates the addition of new employee records. It prompts the user for employee details, performs input validation, updates the employee count, and appends the new records to a specified file.

The Parameters function:

Employee employees[]: An array of Employee structures to store employee records.

int *employeeCount: A pointer to an integer variable representing the total number of employees.

const char *filename: A constant pointer to the filename where new records are appended.

The function opens the specified file in append mode(a). If the file opening fails, it prints an error message and exits.

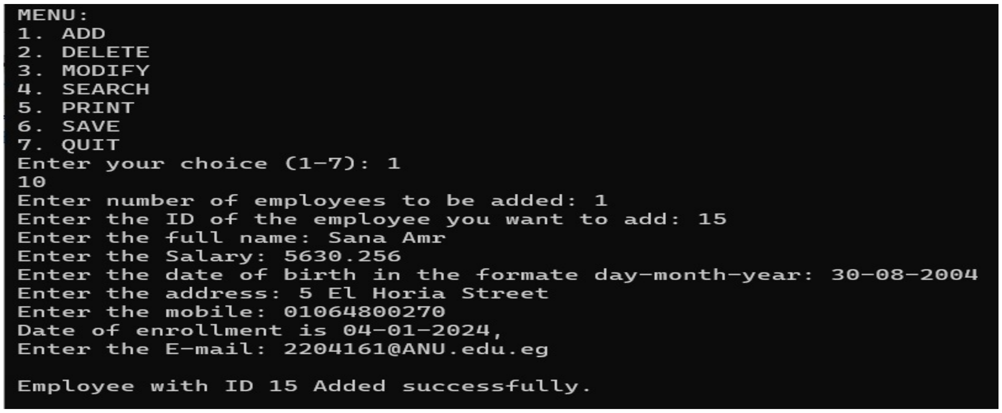
The user is prompted to input the number of employees to be added.

A loop is used to collect details for each new employee, including ID, full name, salary, date of birth, address, mobile number, enrollment date, and email.

The entered ID and mobile number are validated using the

The function automatically captures and assigns the current date as the enrollment date for the added employee.

The function increments the employee count and prints a success message for each added employee.



```
MENU:
1. ADD
2. DELETE
3. MODIFY
4. SEARCH
5. PRINT
6. SAVE
7. QUIT
Enter your choice (1-7): 1
10
Enter number of employees to be added: 1
Enter the ID of the employee you want to add: 15
Enter the full name: Sana Amr
Enter the Salary: 5630.256
Enter the date of birth in the formate day-month-year: 30-08-2004
Enter the address: 5 El Horia Street
Enter the mobile: 01064800270
Date of enrollment is 04-01-2024,
Enter the E-mail: 2204161@ANU.edu.eg

Employee with ID 15 Added successfully.
```

Delete function:

This function is void function which doesn't return a value

function allows the user to delete multiple employees based on their ID

- In Delete function it takes from the system:

- The file which contains the employees information
- All the read employees data stored in the form of struct string employees
- The employees count pointer that has number of employees to delete from

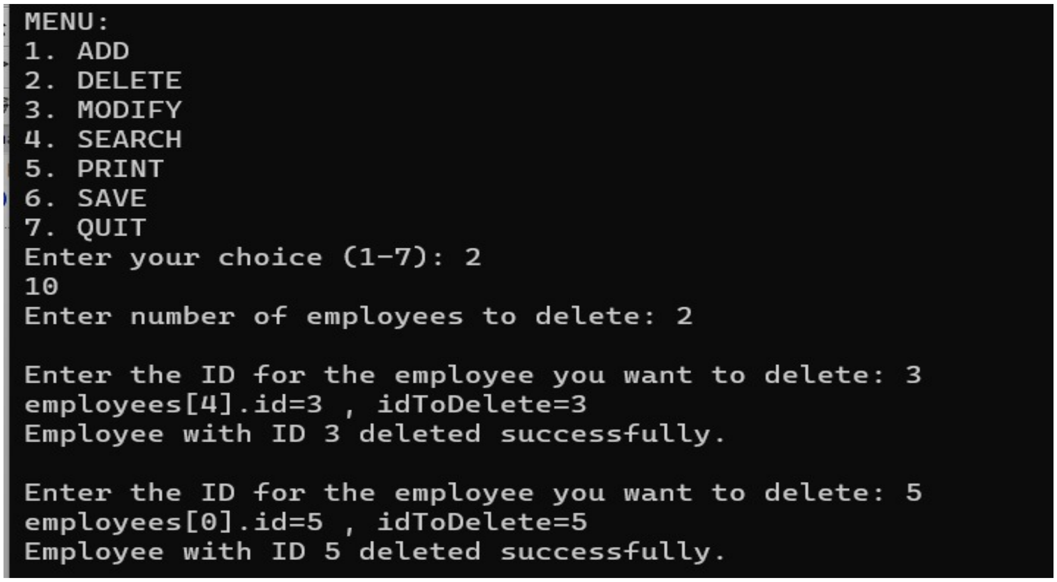
- In Delete function it takes from the user:

- Number of employees to be deleted stored in integer n
- May retake number of wanted employees to get deleted if the entered number is more than number of existed employees
- The ID of the employees that wanted to be deleted
- May retake the ID again if the user entered a non numerical ID or a non existed one

- How does the delete function work:

- It first prompts the user to enter the number of employees to delete, ensuring it's not larger than the existing employee count.
- It then enters a loop to delete the specified number of employees.
- Inside the loop, it prompts the user for the ID to delete and validates that the ID contains only digits.
- It searches for the employee with the given ID and, if found, shifts the elements to remove the employee.
- The function then updates the file with the modified data, and the loop continues until the specified number of employees is deleted.
- It uses a file pointer (fileptr1) to write the updated employee data back to the file, effectively removing the deleted employees.

- The function provides appropriate error messages if the entered ID is not valid or if the employee is not found.



```
MENU:
1. ADD
2. DELETE
3. MODIFY
4. SEARCH
5. PRINT
6. SAVE
7. QUIT
Enter your choice (1-7): 2
10
Enter number of employees to delete: 2

Enter the ID for the employee you want to delete: 3
employees[4].id=3 , idToDelete=3
Employee with ID 3 deleted successfully.

Enter the ID for the employee you want to delete: 5
employees[0].id=5 , idToDelete=5
Employee with ID 5 deleted successfully.
```

Menu Function:

This function is void type, does not return a value.

In menu function it takes from the user number of operations

How does the menu function works?

The DisplayMenu function displays a menu of options to the user using a do-while loop.

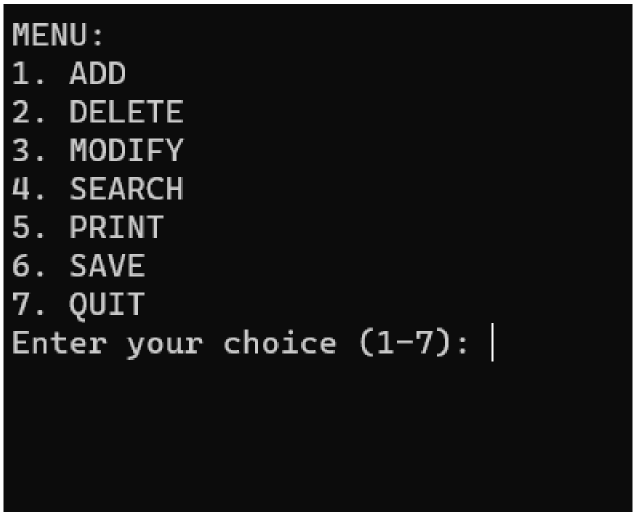
Inside the loop, the menu is displayed, and the user is prompted to enter a choice.

A switch statement is used to execute the corresponding function based on the user's choice.

The Add, Delete, Modify, Query, print_sort, Save, and quit functions are called as per the user's selection.

If the user enters an invalid choice, a message is displayed, and the loop continues.

The loop continues until the user chooses to quit (option 7).



```
MENU:
1. ADD
2. DELETE
3. MODIFY
4. SEARCH
5. PRINT
6. SAVE
7. QUIT
Enter your choice (1-7):
```

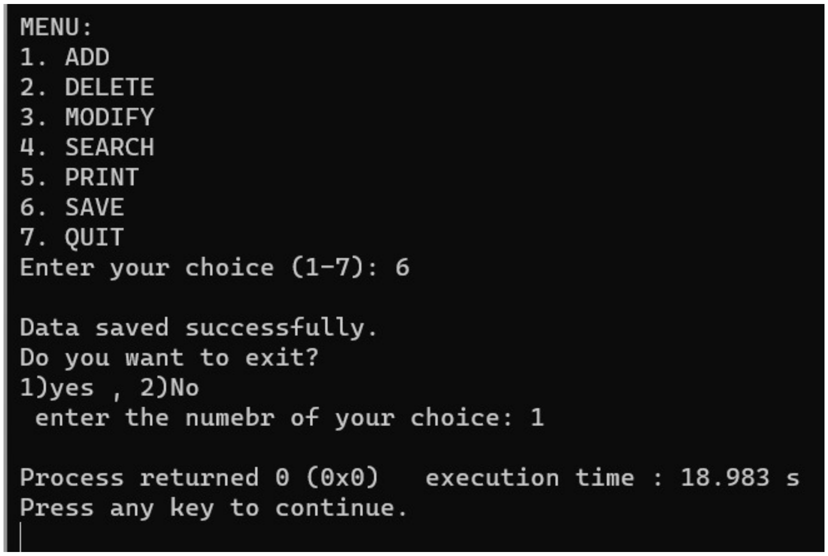
Save Function:

This function is void type, does not return a value.

In save function it doesn’t takes input from the user .

How does the save function works?

- It opens the file specified by the filename parameter in "append and read" mode ("a+"). This mode allows both reading and writing, creating the file if it does not exist.
- It checks if the file was opened successfully. If not, it prints an error message and returns from the function.
- It then enters a loop to iterate through each employee and write their data to the file using the fprintf function.
- The fprintf function writes formatted data to the file, including the employee's ID, full name, salary, date of birth, address, mobile, enrollment date, and email.
- The loop continues until all employees' data has been written to the file.
- After completing the writing process, the function closes the file using fclose.
- It prints a success message indicating that the data has been saved successfully.
- The exit(0) statement is used to exit the program. Keep in mind that using exit might not be suitable in all cases, and you might want to handle program termination differently based on your application's requirements.



```
MENU:
1. ADD
2. DELETE
3. MODIFY
4. SEARCH
5. PRINT
6. SAVE
7. QUIT
Enter your choice (1-7): 6

Data saved successfully.
Do you want to exit?
1)yes , 2)No
 enter the numebr of your choice: 1

Process returned 0 (0x0)   execution time : 18.983 s
Press any key to continue.
```

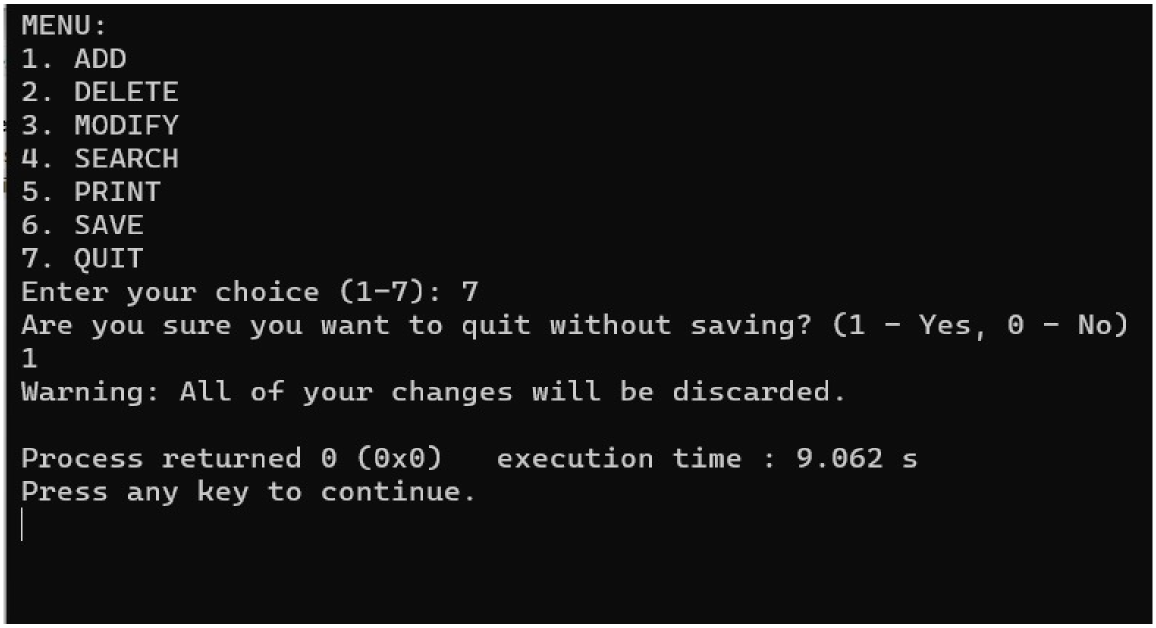
Quit Function:

This function is void type, does not return a value.

In quit function asks the user whether they want to quit without saving.

How does the quit function work?

- it uses the scanf function to read the user's choice (1 for Yes, 0 for No).
- The getchar function is used to consume the newline character left in the input buffer after the scanf.
- If the user chooses to quit (choice == 1), a warning message is displayed, and the program exits using exit(0).
- If the user chooses not to quit (choice == 0), an optional message is displayed, and the program can continue. Depending on your design, you might want to handle this differently, such as returning to the calling function or taking other actions.



```
MENU:
1. ADD
2. DELETE
3. MODIFY
4. SEARCH
5. PRINT
6. SAVE
7. QUIT
Enter your choice (1-7): 7
Are you sure you want to quit without saving? (1 - Yes, 0 - No)
1
Warning: All of your changes will be discarded.

Process returned 0 (0x0)   execution time : 9.062 s
Press any key to continue.
```

Modify function:

At first this function is void type, does not return a value.

The purpose of void function is to perform a task or set of tasks without returning a value.

In Modify function it takes from the user

- the file which contains the information of the employees.
- the employees in the form of array to store their data which is defined as struct.
- the employeecount as a pointer to count the number of employees.

How does the load function works?

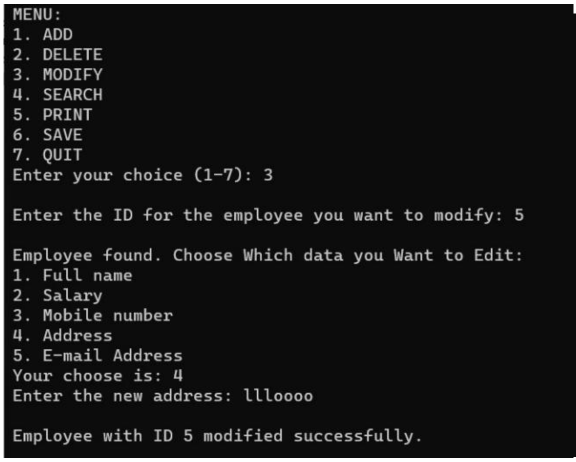
The user enter the id that he want to modify

Using for loop to search for a specific employee

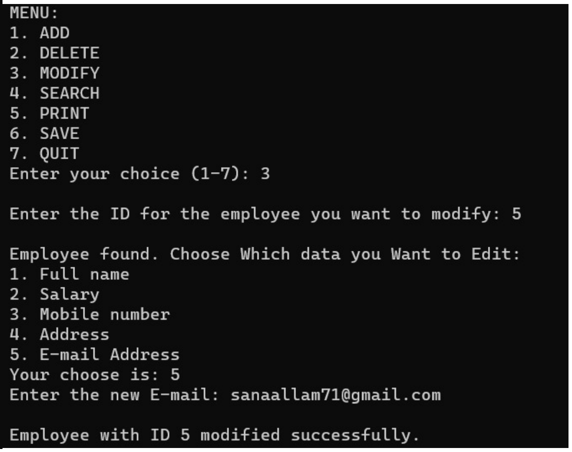
By using function strsrt if the id for the employee are existed then the user will choose the information that he want to modify (full name -salary-Mopile number-Address-E-mail Address)

When the number is choosen then the user will be able to modify the choosen number

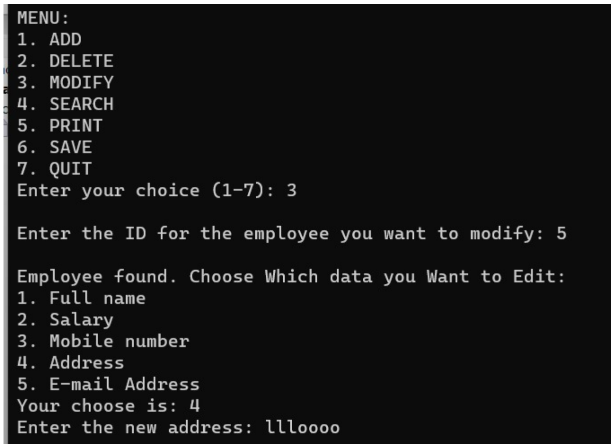
Then open a text file to add all the changes to the file by useing for loop after adding all the changes close the text file .



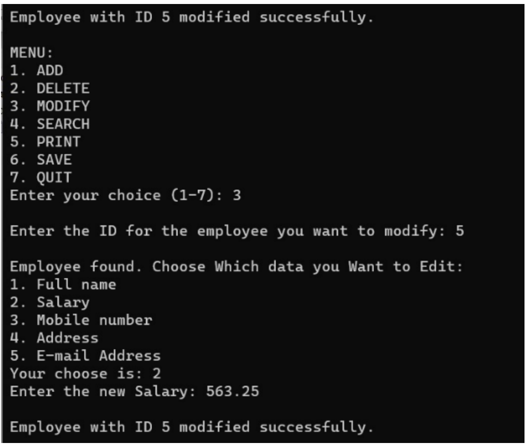
```
MENU:
1. ADD
2. DELETE
3. MODIFY
4. SEARCH
5. PRINT
6. SAVE
7. QUIT
Enter your choice (1-7): 3

Enter the ID for the employee you want to modify: 5

Employee found. Choose Which data you Want to Edit:
1. Full name
2. Salary
3. Mobile number
4. Address
5. E-mail Address
Your choose is: 4
Enter the new address: llloooo

Employee with ID 5 modified successfully.
```



```
MENU:
1. ADD
2. DELETE
3. MODIFY
4. SEARCH
5. PRINT
6. SAVE
7. QUIT
Enter your choice (1-7): 3

Enter the ID for the employee you want to modify: 5

Employee found. Choose Which data you Want to Edit:
1. Full name
2. Salary
3. Mobile number
4. Address
5. E-mail Address
Your choose is: 5
Enter the new E-mail: sanaallam71@gmail.com

Employee with ID 5 modified successfully.
```



```
MENU:
1. ADD
2. DELETE
3. MODIFY
4. SEARCH
5. PRINT
6. SAVE
7. QUIT
Enter your choice (1-7): 3

Enter the ID for the employee you want to modify: 5

Employee found. Choose Which data you Want to Edit:
1. Full name
2. Salary
3. Mobile number
4. Address
5. E-mail Address
Your choose is: 4
Enter the new address: llloooo
```



```
Employee with ID 5 modified successfully.

MENU:
1. ADD
2. DELETE
3. MODIFY
4. SEARCH
5. PRINT
6. SAVE
7. QUIT
Enter your choice (1-7): 3

Enter the ID for the employee you want to modify: 5

Employee found. Choose Which data you Want to Edit:
1. Full name
2. Salary
3. Mobile number
4. Address
5. E-mail Address
Your choose is: 2
Enter the new Salary: 563.25

Employee with ID 5 modified successfully.
```

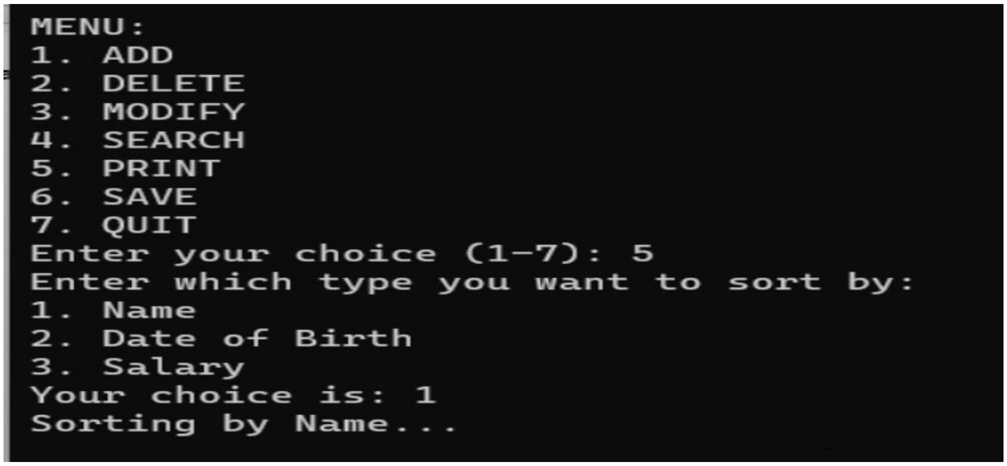
Print (Sort) Function:

- added functions for sorting by name (SortByName) and printing to a file (PrintToFile) to keep the code modular and easier to understand.
- The sorting functions (SortByName, SortByDOB, SortBySalary)

Sorting by Name:

- File Opening: Open the file in "append" mode ("a"). If the file opening fails, print an error message and return.

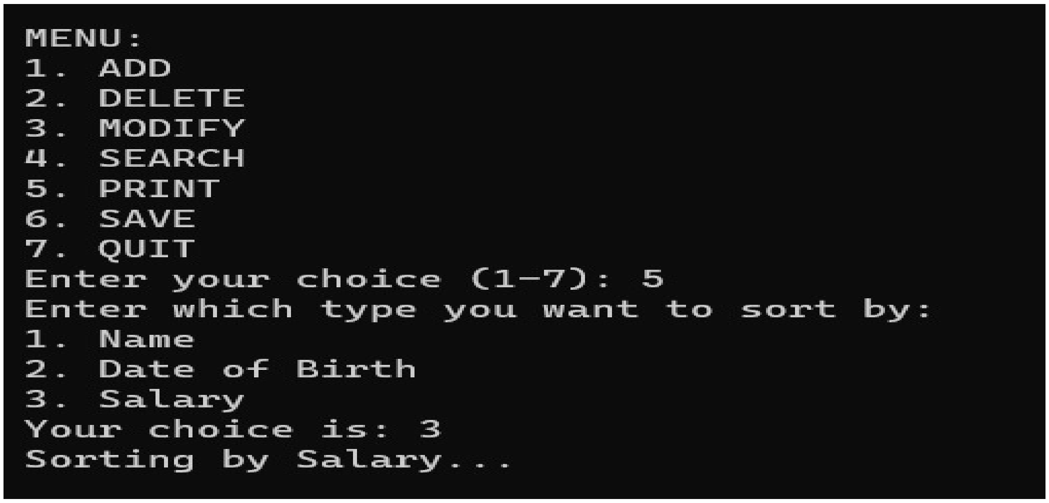
- Sorting: Perform a nested loop to compare and sort employees based on their full names using the strcmp function.
- Swapping: Swap the data of two employees if they are out of order, using a temporary Employee structure (temp).
- Write to File: After sorting, write the sorted data back to the file.
- File Closing: Close the file.



```
MENU:
1. ADD
2. DELETE
3. MODIFY
4. SEARCH
5. PRINT
6. SAVE
7. QUIT
Enter your choice (1-7): 5
Enter which type you want to sort by:
1. Name
2. Date of Birth
3. Salary
Your choice is: 1
Sorting by Name...
```

Sorting by Salary :

- File Opening: Open the file in "write" mode ("w"). If the file opening fails, print an error message and return.
- Sorting: Perform a nested loop to compare and sort employees based on their full names.
- Swapping: Swap the entire Employee structure if employees are out of order.
- Write to File: After sorting, write the sorted data back to the file.
- File Closing: Close the file.



```
MENU:
1. ADD
2. DELETE
3. MODIFY
4. SEARCH
5. PRINT
6. SAVE
7. QUIT
Enter your choice (1-7): 5
Enter which type you want to sort by:
1. Name
2. Date of Birth
3. Salary
Your choice is: 3
Sorting by Salary...
```

Printing and Sorting Menu:

User Input: Prompt the user to enter a choice for sorting:

Option 1: Sort by Name

Option 2: Sort by Date of Birth (not implemented)

Option 3: Sort by Salary

Menu Loop (do-while): Use a do-while loop to repeatedly prompt the user until a valid choice (1, 2, or 3) is entered.

Switch Statement: Based on the user's choice (x), execute the corresponding case:

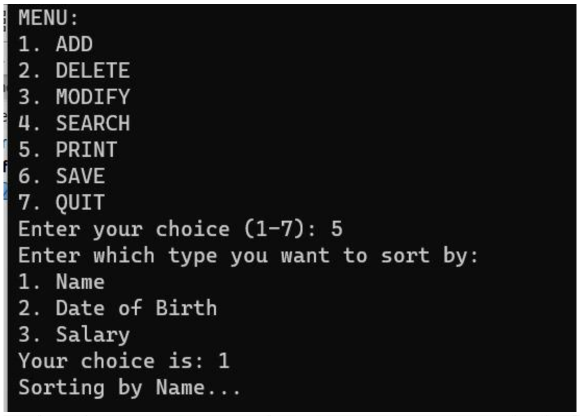
Case 1: Sort by Name using the SortByName function.

Case 2: Sort by Date of Birth (not implemented; placeholder comment).

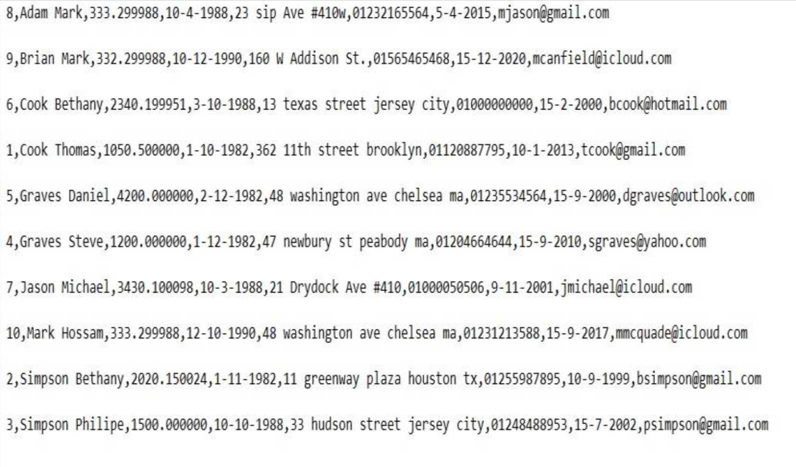
Case 3: Sort by Salary using the SortBySalary function.

Default: Print an error message and prompt the user again.

Loop Condition: The loop continues until the user enters a valid choice (1, 2, or 3).



```
MENU:
1. ADD
2. DELETE
3. MODIFY
4. SEARCH
5. PRINT
6. SAVE
7. QUIT
Enter your choice (1-7): 5
Enter which type you want to sort by:
1. Name
2. Date of Birth
3. Salary
Your choice is: 1
Sorting by Name...
```



```
8,Adam Mark,333.299988,10-4-1988,23 sip Ave #410w,01232165564,5-4-2015,mjason@gmail.com

9,Brian Mark,332.299988,10-12-1990,160 W Addison St.,01565465468,15-12-2020,mcanfield@icloud.com

6,Cook Bethany,2340.199951,3-10-1988,13 texas street jersey city,01000000000,15-2-2000,bcook@hotmail.com

1,Cook Thomas,1050.500000,1-10-1982,362 11th street brooklyn,01120887795,10-1-2013,tcook@gmail.com

5,Graves Daniel,4200.000000,2-12-1982,48 washington ave chelsea ma,01235534564,15-9-2000,dgraves@outlook.com

4,Graves Steve,1200.000000,1-12-1982,47 newbury st peabody ma,01204664644,15-9-2010,sgraves@yahoo.com

7,Jason Michael,3430.100098,10-3-1988,21 Drydock Ave #410,01000050506,9-11-2001,jmichael@icloud.com

10,Mark Hossam,333.299988,12-10-1990,48 washington ave chelsea ma,01231213588,15-9-2017,mmcquade@icloud.com

2,Simpson Bethany,2020.150024,1-11-1982,11 greenway plaza houston tx,01255987895,10-9-1999,bsimpson@gmail.com

3,Simpson Philipe,1500.000000,10-10-1988,33 hudson street jersey city,01248488953,15-7-2002,psimpson@gmail.com
```

Reference:

[1] https://stackoverflow.com/questions/55625989/how-to-use-fscanf-format-string

[3] https://www.geeksforgeeks.org/c-program-to-write-your-own-atoi/

[4] https://youtu.be/i1MeXMciy6Q?si=OTEJ0m9hCbMBDflC

[5] https://www.geeksforgeeks.org/use-fflushstdin-c/

[6] https://www.tutorialspoint.com/c_standard_library/c_function_strtok.htm