Project Tittle : Employee Management System

Team : Cryptic Coders

Course Name: Data Structure Lab

Course Code: CSE 134

Submitted to:

Rishad Amin Pulok
Lecturer
Department of Computer Science & Engineering,
Metropolitan University, Sylhet.

Submitted by:

Jibran Masum Didar - ID: 232-115-013
Md Masudul Hasan Akib - ID: 232-115-015
Md Udoy Hossain Tahim- ID: 232-115-020
Batch: 59th
Section: A
Department of Computer Science & Engineering.
Metropolitan University, Sylhet.

Date of submission: 13-11-2024

Project Report: Employee Management System

Introduction

The **Employee Management System** is a terminal-based application developed in C that streamlines the process of managing employee records. This system offers functionalities such as adding, searching, viewing, and deleting employee details. Additionally, it incorporates password protection for secure operations. Designed for small businesses or organizations, the system is a lightweight yet efficient solution for handling employee data in an organized manner.

Objectives

The primary goals of this project are to:

1. Develop a simple, intuitive, and user-friendly employee management system.
2. Implement secure access for critical operations like adding and deleting employee records.
3. Provide flexible search functionalities to quickly retrieve employee data by name or ID.
4. Explore and demonstrate the efficient use of arrays in C for handling employee information.

Features

1. **Add Employee**:
    - Users can input employee details, including name, position, salary, address, NID, email, and bank account.
    - A unique ID is automatically assigned to each employee.
    - Access to this feature is restricted through password protection.
2. **View Employees**:
    - Displays all employee records stored in the system in a clear and organized format.
    - Enables administrators to quickly review employee information.
3. **Search Employee by Name**:
    - Allows users to search for an employee by their name and view detailed information if a match is found.
4. **Search Employee by ID**:

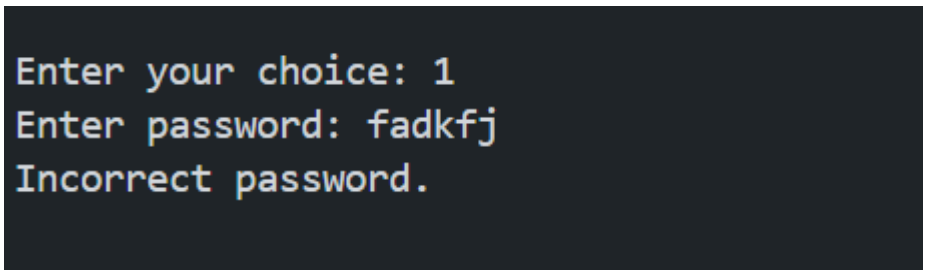
- Enables users to search for an employee using their unique employee ID, ensuring quick access to specific records.

5. **Delete Employee**:
   - Securely deletes an employee's record based on their ID.
   - The system reorganizes the remaining records to maintain data consistency.
6. **Password Protection**:
   - Critical operations, such as adding and deleting employees, require a password to ensure that only authorized users can perform these tasks.

How It Works:

Password Verification:

Password validation is handled using the strcmp() function to compare the entered password with the predefined one. If the password does not match, the operation is aborted, and the user is returned to the main menu. This ensures that sensitive operations, such as adding or deleting employee records, are securely protected from unauthorized access.



Add Employee:

Once the correct password is entered, users can provide employee details, such as name, position, salary, address, NID, email, and bank account information. The system automatically assigns a unique employee ID and stores the data in the corresponding arrays. If the entered password is incorrect, the system displays **"Incorrect password."** cancels the operation, and returns the user to the main menu.

```
Employee Management System

1. Add Employee (Password Protected)
2. View Employees
3. Search Employee by Name
4. Search Employee by ID
5. Delete Employee (Password Protected)
6. Exit

Enter your choice:
```

```
Enter your choice: 1
Enter password: 2cRyP_Ti!C
Correct password.
Employee name: Sadman Shakib
Position: Manager
Salary: 20000
Address: 164/A,Jalalabad R/A,Sylhet 3100
NID: 1716541239
Email: shadmanshakib12@gmail.com
Bank account: 5889871237
Employee added successfully! ID: 1

Employee Management System

1. Add Employee (Password Protected)
2. View Employees
3. Search Employee by Name
4. Search Employee by ID
5. Delete Employee (Password Protected)
6. Exit


Enter your choice:
```

View Employees:

The system displays all stored employee records in a well-organized, tabular format. This allows administrators to easily review and access detailed information for each employee at a glance.

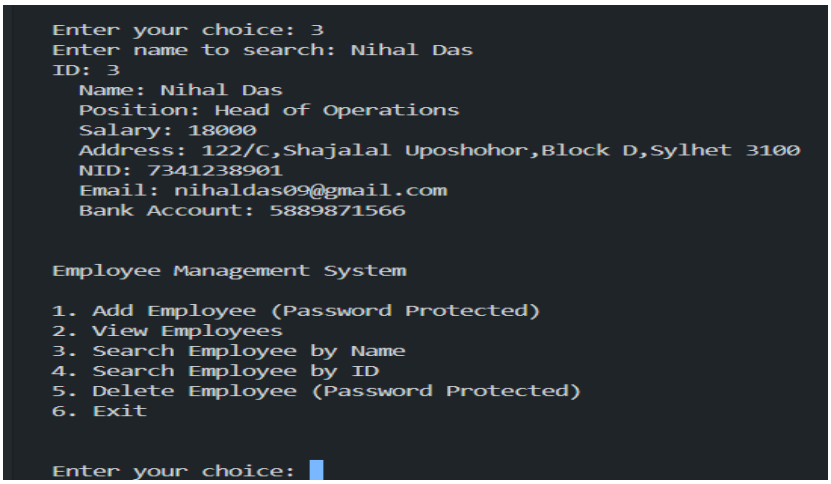
```
ID: 1
  Name: Sadman Shakib

  Position: Manager

  Salary: 20000

  Address: 164/A,Jalalabad R/A,Sylhet 3100

  NID: 1716541239

  Email: shadmanshakib12@gmail.com

  Bank Account: 5889871237

----------------------------
ID: 2
  Name: Anha Chowdhury

  Position: Asst. Manager

  Salary: 15000

  Address: 145/B,Kumarpara R/A,Sylhet 3100

  NID: 7224567652

  Email: anhacwd54@yahoo.com

  Bank Account: 5889871432

----------------------------
ID: 3
  Name: Nihal Das

  Position: Head of Operations

  Salary: 18000

  Address: 122/C,Shajalal Uposhohor,Block D,Sylhet 3100

  NID: 7341238901

  Email: nihaldas09@gmail.com

  Bank Account: 5889871566

----------------------------
```

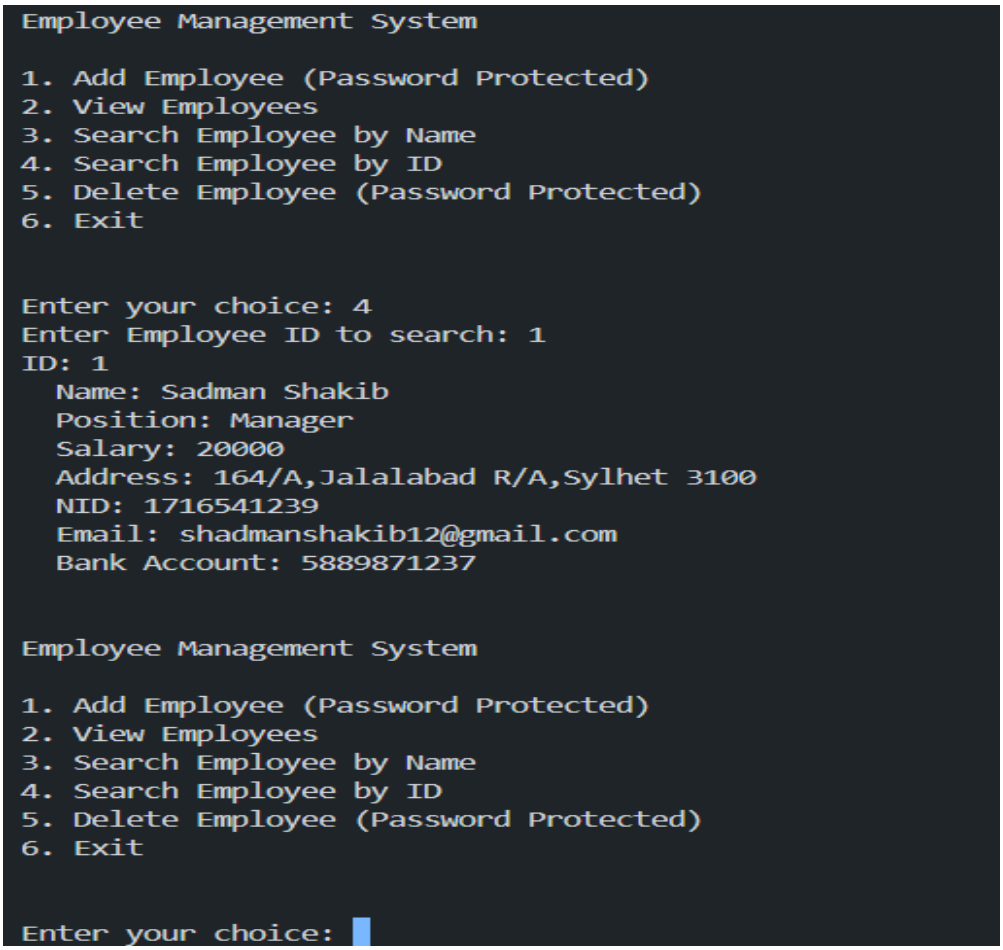
Also, If no employee records are available, a message saying "**No employees in the system**" is displayed. This ensures that the user is informed about the absence of any data, instead of showing an empty list.

```
Employee Management System

1. Add Employee (Password Protected)
2. View Employees
3. Search Employee by Name
4. Search Employee by ID
5. Delete Employee (Password Protected)
6. Exit


Enter your choice: 2
No employees in the system.
```

Search Employee by Name or ID:

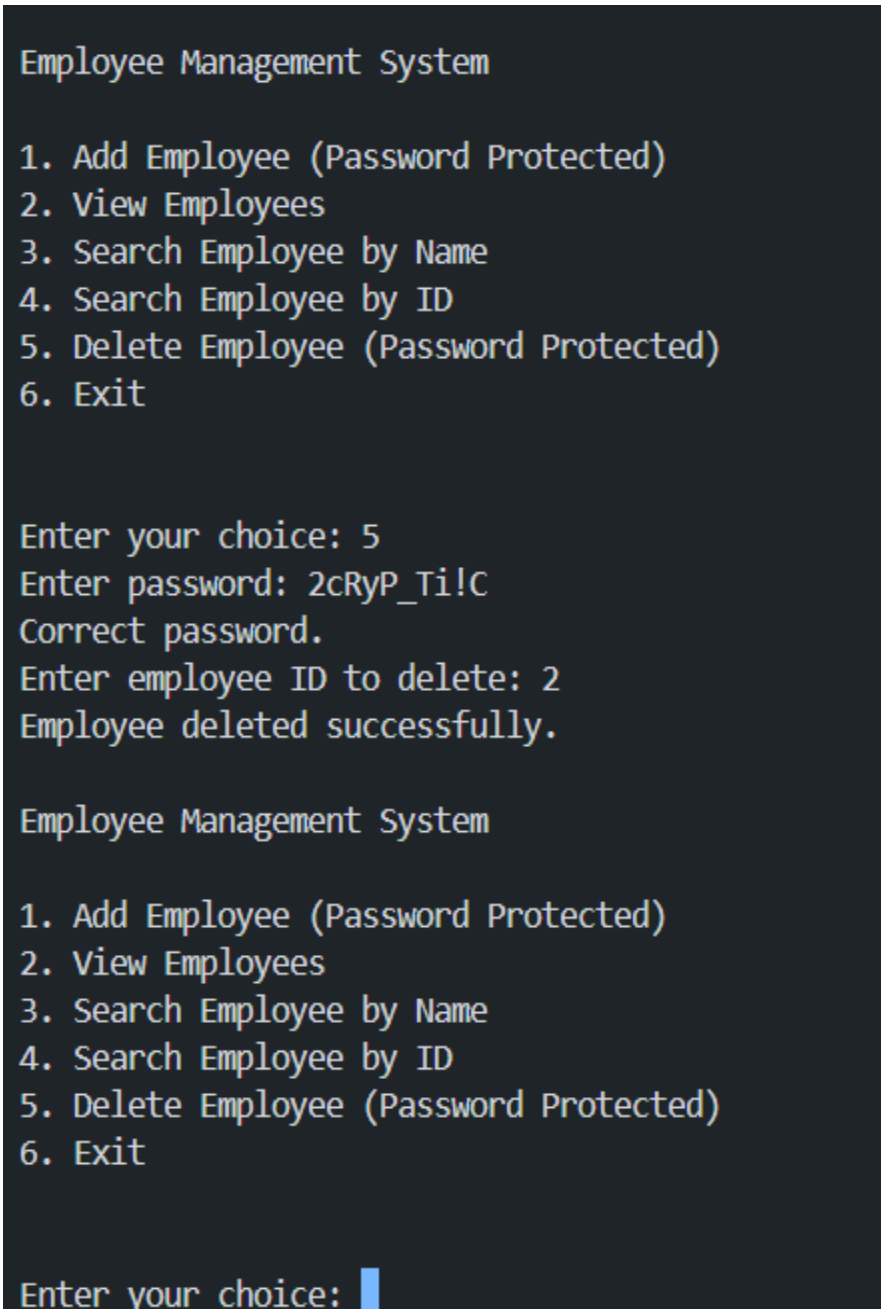
Users can search for an employee either by their name or ID. The system scans the records to find a match. If the employee is found, their full details are displayed. If no match is found, a "not found" message is shown, ensuring the user is informed.





Delete Employee:

Before proceeding with the deletion, the user must enter the correct password for verification. Once the password is successfully verified, the user is prompted to provide the employee's ID they wish to delete. The system then removes the corresponding record and shifts the remaining entries to ensure data consistency, maintaining a seamless list of employee records without gaps or errors.



Exit:

When the user selects option 6 from the menu, the program will terminate and return control to the system shell or terminal. This provides a smooth and user-friendly way to exit the application.

```
Employee Management System

1. Add Employee (Password Protected)
2. View Employees
3. Search Employee by Name
4. Search Employee by ID
5. Delete Employee (Password Protected)
6. Exit


Enter your choice: 6
Exit
PS C:\Users\Acer\Desktop\Project.1>
```

Comparison with Similar Codes:

Reference Code 1: Employee Record System in C **(https://thetechthunder.com/posts/employee-record-system-in-c)**

Difference:

The reference code lacks password protection for sensitive operations.

My code allows searching by both name and ID, while the reference supports only ID. On the otherhand, the reference code supports searching only by ID, limiting search capabilities.

Advantages of Our Code:

1. **Enhanced Security:** Password protection ensures that only authorized users can access and perform operations, safeguarding user data.
2. **Flexible Search Options:** The ability to search by both name and ID improves user experience by providing multiple ways to access information.

Reference Code 2: Simple CRUD System (https://github.com/gabrielwitor/CRUD-C**)**

Difference:

1. **Our Code:** Implements file storage for user account details, balances, and transaction records, but in a more structured and straightforward manner, making it easier for beginners to understand.

2. **Reference Code**: Uses file storage as well, but its structure is more complex, which could be challenging for beginners to implement correctly.

Advantage of Our Code:

1. **Lightweight Design:** The structure and flow of our code are simpler, making it easier for beginners to read, understand, and modify for basic use cases without getting overwhelmed by complex operations.

2. **Beginner-Friendly:** Our code provides a smooth learning curve for individuals who are just starting with file handling in C, allowing quick setups without sacrificing essential features like account security and data management.

Why Our Code is Better:

1. It is simple yet powerful, making it ideal for beginners and small-scale systems.
2. The addition of password-protected features ensures better security compared to similar codes.
3. The flexibility to search by both name and ID improves usability.
4. The code is modular and easy to expand, allowing future improvements.

Limitations:

1. The system can store only up to 100 employees due to the array size limitation.
2. There is no file system integration, meaning all data is lost when the program is closed, as the system currently only stores information in volatile memory (RAM).
3. The password is hardcoded and cannot be changed dynamically, limiting flexibility for password management.
4. There is no validation for input formats, such as ensuring the correctness of email addresses, NID numbers, or other fields, which may lead to incorrect or inconsistent data entries.

Future Enhancements
In the future, we plan to improve the Employee Management System by adding the following features:

1. **Data saving**: We will create a way to store employee information permanently, so the data won't be lost when the program is closed. This could involve saving the data to a file or a database.
2. **Advanced Search and Filtering**: We will add better search options, allowing users to filter employees by things like salary, position, or other details. This will make it easier to find specific employees.
3. **Security Improvements**: We will make the system more secure by adding features like password encryption (for safer password storage) and possibly adding two-factor authentication to protect sensitive information.
4. **User Interface (UI) Improvements**: We will work on making the system easier to use. This could include creating a graphical interface (GUI) or even moving the system to the web so that it's more accessible.
5. **Performance Optimizations**: We will improve the system's speed, especially when dealing with a lot of data, to make sure it can handle larger numbers of employees and work efficiently.

Conclusion

This Employee Management System is a compact yet efficient solution for managing employee records. While it has some limitations, it is a great starting point for building more advanced systems. Future updates could include features like file storage, dynamic password updates, and better input validation.