Programming Fundamentals Project (CS 1002)

Fast Hospital Management System

Section: BCY-1A

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Aim:-

The Aim of this project is to produce an efficient and user friendly Hospital management system making it easier for the user to access the system:adding data,displaying information for patients and accessing data for bed availability and Doctor appointments.

Research:

- **Healthcare Industry Challenges:**
  - Inefficient patient management
  - Paper-based record keeping
  - Lack of real-time data access
- **Technology Solutions:**
  - Hospital Management Systems (HMS)
  - Appointment Scheduling Systems

Project Selection:

Given the identified challenges and the potential of technology to address them, we selected the development of a Hospital Management System (HMS) as our project. This system aims to improve efficiency, and enhance patient care.

Project Specification:

- Structures used to store Patient's details such as name,age,gender,illness
- Arrays and files storing data of multiple patients .
- Binary files used for enhancing security of Data.
- Doctor Assignment for each patient
- Total Bill Calculation
- Menu Displayed(Add New Patients,Assign Bed,View All Patients,Check Bed Status,Generate Bill)

Problem Analysis:

The primary problems identified in the current hospital management process include:

- **Manual Record Keeping:** Time-consuming and error-prone.
- **Incorrect Doctor Assignment**:Patients assigned wrong doctor
- **Limited Data Accessibility:** Lack of real-time access to patient records.
- **Poor Communication:** Ineffective communication between departments and staff.

Solution Design (Project Detail, Functionality, and Features):

Project Detail:

The HMS will be a C-language based program code that will provide a platform for managing various hospital operations.

Functionality:

- **Patient Management:**
  - Patient addition and details management
  - Bed assignment
- **Doctor Management:**
  - Patient consultation management
- **Finance Management:**
  - Billing and payment processing

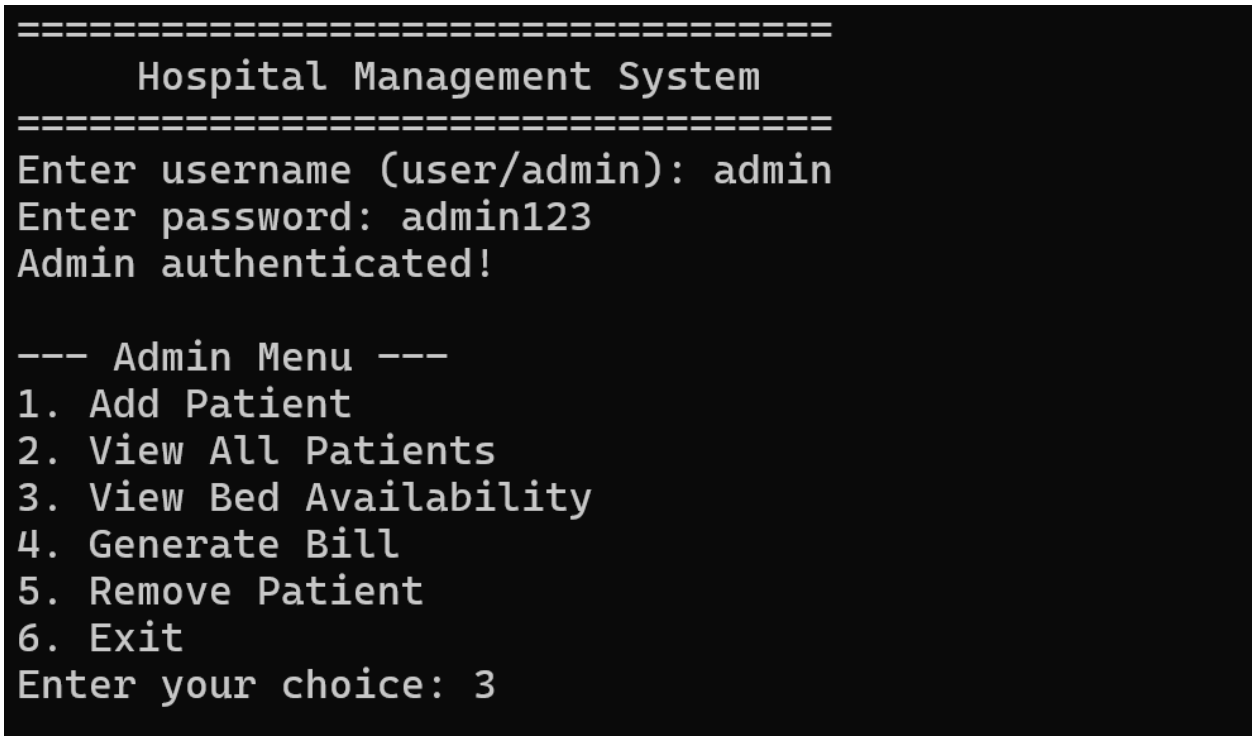
Features:

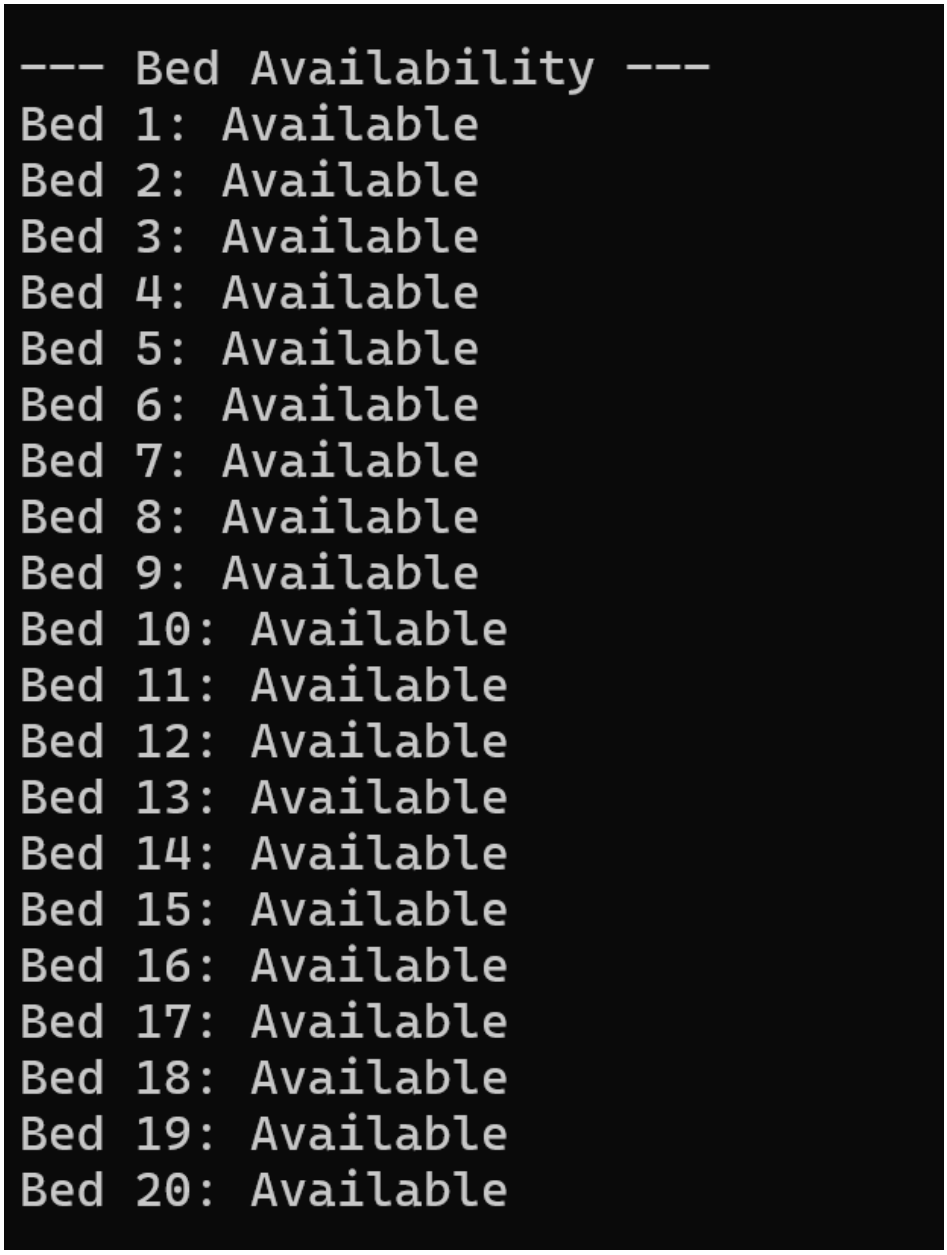
- **User-friendly interface**
- **Secure Access Management:**Admin and Users have different ids and passwords
- **Real-time data access:** Up-to-date information for efficient decision-making.

Technologies:

C-language used on Vs Code and Dev C++

Results (Output Screenshots):(LOGIN SYSTEM IN FIRST FIGURE)





This shows bed availability before adding any patient

```
Enter your choice: 1
Enter patient name: Mike
Enter age: 9
Enter gender: M
Enter illness: child
Enter days of stay: 49
Enter service charges: 3500
Enter doctor fee: 5000
Patient added successfully! Assigned Bed: 1, Assigned Doctor: Dr. Pediatrics

--- Admin Menu ---
1. Add Patient
2. View All Patients
3. View Bed Availability
4. Generate Bill
5. Remove Patient
6. Exit
Enter your choice: 1
Enter patient name: Brock
Enter age: 35
Enter gender: M
Enter illness: kidney
Enter days of stay: 72
Enter service charges: 8000
Enter doctor fee: 90000
Patient added successfully! Assigned Bed: 2, Assigned Doctor: Dr. Urology
```

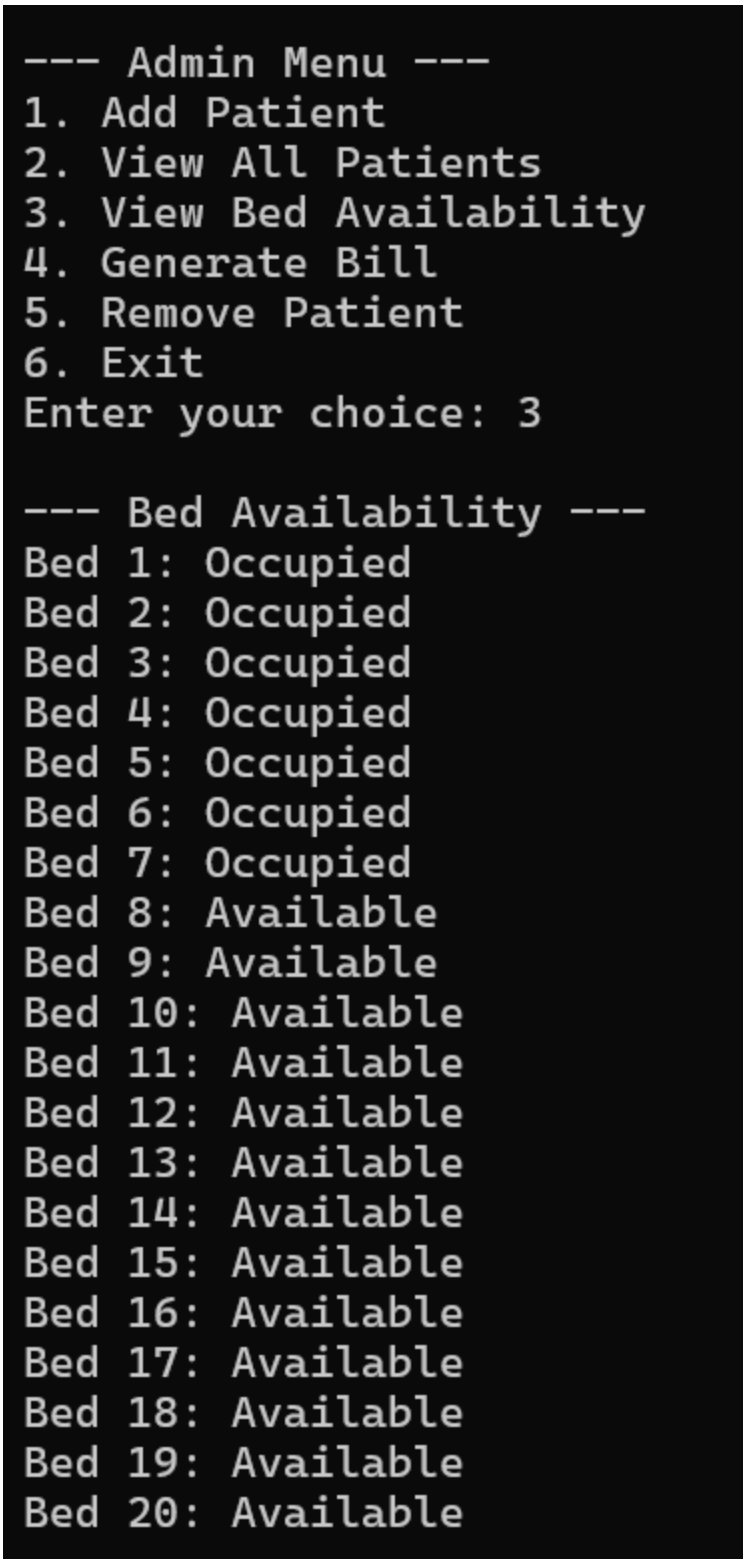
This shows adding patients and being saved successfully in a textfile.

```
Enter patient name: Hadi
Enter age: 99
Enter gender: M
Enter illness: stomach
Enter days of stay: 45
Enter service charges: 1000
Enter doctor fee: 6500
Patient added successfully! Assigned Bed: 7, Assigned Doctor: Dr. Gastroenterology

--- Admin Menu ---
1. Add Patient
2. View All Patients
3. View Bed Availability
4. Generate Bill
5. Remove Patient
6. Exit
Enter your choice: 2

--- Patient List ---
Name: Mike, Age: 9, Gender: M, Illness: child, Assigned Doctor: Dr. Pediatrics, Bed: 1, Total Bill: 33000.00

Name: Brock, Age: 35, Gender: M, Illness: kidney, Assigned Doctor: Dr. Urology, Bed: 2, Total Bill: 134000.00

Name: Fatima, Age: 27, Gender: F, Illness: bone, Assigned Doctor: Dr. Orthopedics, Bed: 3, Total Bill: 35900.00

Name: Asad, Age: 28, Gender: M, Illness: skin, Assigned Doctor: Dr. Dermatology, Bed: 4, Total Bill: 41000.00

Name: Ali, Age: 89, Gender: M, Illness: heart, Assigned Doctor: Dr. Cardiology, Bed: 5, Total Bill: 68590.00

Name: Mila, Age: 67, Gender: F, Illness: cancer, Assigned Doctor: Dr. Oncology, Bed: 6, Total Bill: 360000.00

Name: Hadi, Age: 99, Gender: M, Illness: stomach, Assigned Doctor: Dr. Gastroenterology, Bed: 7, Total Bill: 30000.00
```

This shows all patients details after being added and asked by menu to display

```
--- Admin Menu ---
1. Add Patient
2. View All Patients
3. View Bed Availability
4. Generate Bill
5. Remove Patient
6. Exit
Enter your choice: 4
Enter patient name: Hadi

--- Bill ---
Name: Hadi, Days of Stay: 45, Service Charges: 1000.00, Doctor Fee: 6500.00, Total Bill: 30000.00
```

This Displays the bill for specific patient



Bed availability after patient addition

```
--- Admin Menu ---
1. Add Patient
2. View All Patients
3. View Bed Availability
4. Generate Bill
5. Remove Patient
6. Exit
Enter your choice: 5
Enter patient name to remove: Asad
Patient removed successfully!

--- Admin Menu ---
1. Add Patient
2. View All Patients
3. View Bed Availability
4. Generate Bill
5. Remove Patient
6. Exit
Enter your choice: 2

--- Patient List ---
Name: Mike, Age: 9, Gender: M, Illness: child, Assigned Doctor: Dr. Pediatrics, Bed: 1, Total Bill: 33000.00

Name: Brock, Age: 35, Gender: M, Illness: kidney, Assigned Doctor: Dr. Urology, Bed: 2, Total Bill: 134000.00

Name: Fatima, Age: 27, Gender: F, Illness: bone, Assigned Doctor: Dr. Orthopedics, Bed: 3, Total Bill: 35900.00

Name: Ali, Age: 89, Gender: M, Illness: heart, Assigned Doctor: Dr. Cardiology, Bed: 5, Total Bill: 68590.00

Name: Mila, Age: 67, Gender: F, Illness: cancer, Assigned Doctor: Dr. Oncology, Bed: 6, Total Bill: 360000.00

Name: Hadi, Age: 99, Gender: M, Illness: stomach, Assigned Doctor: Dr. Gastroenterology, Bed: 7, Total Bill: 30000.00


--- Admin Menu ---
```

Removal of Patient and all patients view after removal

Conclusion (Summary & Discussion):

The Hospital Management System project has successfully addressed the identified challenges in the existing hospital management process. By implementing a centralized platform, the system has improved efficiency, reduced errors, and enhanced patient care.

Key achievements:

- Patient registration and appointment scheduling.
- Improved data accuracy and accessibility.
- Enhanced communication between departments.
- Provided real-time insights for better decision-making.

Future Improvements:

- **AI-powered Features:** Implement AI algorithms for predictive analytics and automated tasks.
- **Enhanced Security:** Strengthen security measures to protect sensitive patient data.
- **Mobile App Development:** Create a mobile app for patient self-service and doctor-patient communication.
- **Graphical User Interface(GUI):** GUI to be used to enhance the visual appearance of the system

By continuously evolving and adapting to the changing healthcare landscape, this HMS can contribute to the overall improvement of healthcare delivery.