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Subject: C++
GitHub Link: https://github.com/irenechk/HospitalManagemenet

Hospital Management System using C++

1. Introduction to the Mini Project:

Hospitals deal with a large number of patients every day. Managing patient information, doctor details, and billing manually can lead to errors, data loss, and inefficiency. With the help of computer programming, these tasks can be automated and managed efficiently.

This case study focuses on developing a Hospital Management System using C++, *which helps in maintaining patient records and generating bills using a menu-driven program.*

2. Problem Statement / Case Background (Abstract):

In many small hospitals and clinics, patient records and billing are handled manually. This traditional method is time-consuming and prone to mistakes. There is a need for a simple software system that can store patient details, display records, and calculate hospital bills accurately.

The proposed system uses C++ programming to automate basic hospital operations such as *adding patient details, maintaining a patient file,displaying patient records, and generating bills based on the number of days admitted.*

3. Mini Project Design:

The Hospital Management System is designed as a menu-driven C++ application with the following components:

- ***Patient Class:***
  Stores patient details such as ID, name, age, disease, and assigned doctor.
- ***Billing Class:***
  Calculates the total bill based on the number of days admitted.
- ***Main Function:***
  Controls program flow using a menu and switch-case statements.

Design Features:

- Uses **object-oriented programming**
- Uses **dynamic memory allocation**
- User-friendly menu interface
- Uses Pointers
- Uses File Handling

4. Methods & Algorithms Technology Applied in the Mini Project:

Technologies Used:

- **Programming Language**: C++
- **Concepts Applied**:
  - Classes and Objects
  - Encapsulation
  - Pointers
  - Dynamic Memory Allocation
  - Arrays
  - Control Structures
  - File Handling

Algorithm Used:

1. Display menu options
2. Accept user choice
3. Perform action based on choice:
   - Add patient
   - Display patient records
   - Generate bill
   - Exit program
4. Repeat until exit option is selected

5. Mini Project Implementation Details and Snapshots:

Implementation Details:

- Patient details are stored using a **Patient class**
- Billing calculation is handled by a **Billing class**
- Patient objects are created dynamically using *new*
- Memory is freed using *delete* to avoid memory leaks

Sample Operations:

- Adding patient details
- Displaying all patient records
- Generating hospital bills

```
Hospital Management System
1. Add Patient
2. Display Patient
3. Generate Bill
4. Exit
Enter your choice: 1
Enter Patient ID: 101
Enter Patient Name: Sam
Enter Patient age: 19
Enter Disease: Dengue
Enter doctor Name: Dr.John
Patient added sucessfully!
Hospital Management System
1. Add Patient
2. Display Patient
3. Generate Bill
4. Exit
Enter your choice: 2
Patient1:
Patient ID: 101
Patient Name: Sam
Patient age: 19
Disease: Dengue
Doctor: Dr.John
Hospital Management System
1. Add Patient
2. Display Patient
3. Generate Bill
4. Exit
Enter your choice: 3
Enter Patient ID for billing: 101
Enter number of days admitted: 6
Total Bill for Patient ID: 101 is 9000
Hospital Management System
1. Add Patient
2. Display Patient
3. Generate Bill
4. Exit
Enter your choice: 1
Enter Patient ID: 102
Enter Patient Name: Mark
Enter Patient age: 25
Enter Disease: Fracture
Enter doctor Name: Dr.holt
Patient added sucessfully!
Hospital Management System
1. Add Patient
2. Display Patient
3. Generate Bill
4. Exit
Enter your choice: 3
Enter Patient ID for billing: 102
Enter number of days admitted: 2
Total Bill for Patient ID: 102 is 3000
Hospital Management System
1. Add Patient
2. Display Patient
```

```
101 Sam 19 Dengue Dr.John
102 Mark 25 Fracture Dr.Holt
```

6. Mini Project Results and Conclusion:

Results:

- The system successfully stores and displays patient information.
- Billing is calculated correctly based on the number of days admitted.
- The menu-driven interface makes the system easy to use.

Conclusion:

The Hospital Management System developed using C++ effectively automates basic hospital operations. It demonstrates the practical application of object-oriented programming concepts, pointers, and dynamic memory allocation. This project serves as a strong foundation for understanding real-world software development using C++.

7. References:

1. Let Us C++ by Yashwant Kanetkar
2. C++ Documentation – www.cplusplus.com
3. Lecture Notes and Classroom Materials