**Hostel Pass Management System - Documentation**

**1. Introduction**

The **Hostel Pass Management System** is a C++ program that allows students to apply for passes when they need to leave the hostel and enables the Resident Coordinator (RC) to approve or deny these applications. It uses a **Binary Search Tree (BST)** to manage room allocations and dynamically stores student pass application data.

**2. Features**

* Students can **apply for a pass** by selecting their room and entering their leave & arrival dates.
* A **unique application ID** is generated for each pass request.
* Students can **check the status** of their application.
* The **RC (Resident Coordinator) portal** allows the RC to approve or deny applications.
* Status is displayed in different colors:
  + **Yellow** - Pending
  + **Green** - Approved
  + **Red** - Denied

**3. Data Structures Used**

**3.1. Struct date**

Stores date information.

**3.2. Class Student**

Represents a student applying for a pass.

**3.3. Struct BSTree**

A Binary Search Tree (BST) node that stores **room assignments** and the **students in that room**.

**3.4. Struct sdata**

Stores applied pass data dynamically.

**4. Functions**

**4.1. insertNode()**

Inserts a new room with students into the BST.

**4.2. searchNode()**

Searches for a room in the BST.

**4.3. getData()**

Allows students to apply for a pass by selecting their room and entering leave & arrival dates.

**4.4. printData()**

RC reviews applications and updates status (Approved/Denied).

**4.5. checkStatus()**

Allows students to check their pass status.

**5. Main Program Flow**

1. **Initialize BST** with predefined room and student data.
2. Display the **main menu**:
   * **Student Portal**
     + Apply for a Pass
     + Check Status
   * **RC Portal**
     + Enter password to approve/deny requests.
   * **Exit**

**7. Conclusion**

This program effectively manages hostel pass requests using **BST for room assignments** and **dynamic allocation for pass applications**. With further improvements, it can be scaled into a **full-fledged hostel management system** with a database integration.