**ISP Management System Documentation**

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**Introduction**

This document provides a comprehensive overview of the ISP Management System project. The system allows administrators to manage customer requests, complaints, payments, and network-related operations, while users can register complaints, pay bills, and change their service packages. The system is implemented using Data Structures and Algorithms (DSA) to ensure efficient and effective management.

**Function Overview**

**Admin Menu**

The adminmenu() function displays the options available to the ISP administrator:

1. Accept New Connection Request
2. Block Unpaid Customers
3. View All Customers
4. Process Complaints
5. Set All Customers as Unpaid
6. Shortest Path (Dijkstra)
7. Minimum Spanning Tree (Prim's)
8. View and Update Packages

**User Menu**

The userMenu() function displays the options available to the ISP customers:

1. Register Complain
2. Pay Bills
3. Change Package

**Detailed Function Descriptions**

**Admin Menu Functions**

1. **Accept New Connection Request**:
   * Allows the admin to process and approve new customer connection requests.
2. **Block Unpaid Customers**:
   * Blocks customers who have not paid their bills.
3. **View All Customers**:
   * Displays a list of all customers in the system.
4. **Process Complaints**:
   * Handles and resolves complaints registered by customers.
5. **Set All Customers as Unpaid**:
   * Resets the payment status of all customers to unpaid.
6. **Shortest Path (Dijkstra)**:
   * Uses Dijkstra's algorithm to find the shortest path in the network.
7. **Minimum Spanning Tree (Prim's)**:
   * Uses Prim's algorithm to find the minimum spanning tree of the network.
8. **View and Update Packages**:
   * Allows the admin to view and update the service packages available to customers.

**User Menu Functions**

1. **Register Complain**:
   * Enables users to register complaints about the service.
2. **Pay Bills**:
   * Allows users to pay their outstanding bills.
3. **Change Package**:
   * Enables users to change their current service package.

**Data Structures**

The system utilizes various data structures to manage customer data, connection requests, and network details. Some of the key data structures used are:

* **Priority Queues**:
  + Customers connection requests, complaints
* **Graphs**:
  + Network representation, To find MST and shortest path from Source Node(Dijkstra)
* **AVL TREE**:
  + Customer data stored in AVL for efficient searching and retrieval.

**Algorithms**

**Dijkstra's Algorithm**

Dijkstra's algorithm is used to find the shortest path between nodes in a graph, which represents the network of connections. This is useful for network optimization and troubleshooting.

**Prim's Algorithm**

Prim's algorithm is used to find the minimum spanning tree of a graph, ensuring that all nodes are connected with the minimum total edge weight. This is important for designing efficient and cost-effective networks.

**Conclusion**

The ISP Management System project leverages Data Structures and Algorithms to efficiently manage customer and network operations. By providing separate menus for administrators and users, the system ensures a user-friendly interface and robust functionality. This documentation covers the core components and functionalities of the system, providing a clear understanding of its capabilities and implementation.