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***PRIOJECT***

INTERNET SERVICE PROVIDER SYSTEM

***Subject:***

**dsa**

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**Internet Service Provider System Documentation**

1. **Introduction:**

The Internet Service Provider (ISP) System is a software application designed to manage the operations of an internet service provider company. It provides functionalities for handling customer registrations, managing internet packages, processing billing, resolving customer complaints, and optimizing network connectivity.

1. **Features:**

* Customer Registration: Allows new customers to request an internet connection by providing their name and desired package type (Premium, Business, or Student).
* Package Management: Supports different types of internet packages with varying features and pricing.
* Billing and Payment: Tracks customer payments and allows users to pay their bills, ensuring uninterrupted internet service.
* Complaint Handling: Enables customers to register complaints, prioritizing them based on the package type and resolving them in a timely manner.
* Network Optimization: Uses Prim's algorithm to find the best routes for connecting network locations efficiently, ensuring reliable internet connectivity.
* Customer Management: Maintains a database of customers, their package details, and payment status.
* User Roles: Provides separate interfaces for administrators and customers, each with specific functionalities.

1. **Data Structures and Algorithms:**

The project utilizes three fundamental data structures: Heap Priority Queues, AVL Tree, and Graphs, to achieve this objective. This report provides an overview of the project, discussing the connections, complaints, and the use of these data structures.

* **AVL Tree**: Used to store customer data efficiently, enabling quick retrieval and modification operations.
* **Heap Priority Queues:** Utilized for managing customer connection requests and complaints, prioritizing them based on package type, where Premium package is provided with maximum priority and so on.
* **Prim's Algorithm**: Employed to find the minimum spanning tree of network locations, optimizing network connectivity.

1. **Functionality:**

* Customer Registration: Customers can request a new internet connection by providing their name and preferred package type. The system assigns a unique ID to each customer and adds them to the AVL tree for future reference.
* Package Selection: Customers can choose from various packages (Premium, Business, Student) based on their requirements and budget.
* Billing and Payment: The system keeps track of customer payments. Users can pay their bills, and their payment status is updated accordingly.
* Complaint Registration: Customers can register complaints regarding internet connectivity or service issues. The system prioritizes complaints based on the package type and ensures timely resolution.
* Network Optimization: The system utilizes Prim's algorithm to find the best routes for connecting network locations efficiently. This optimization enhances the overall network performance.
* Customer Management: The AVL tree structure allows efficient retrieval, modification, and deletion of customer records. Administrators can view customer details, including package type and payment status.
* User Roles: The system provides separate interfaces for administrators and customers. Administrators have additional functionalities like managing customer requests, handling complaints, and optimizing the network.

1. **System Workflow:**

* Customers request a new internet connection by providing their details and desired package type.
* The system assigns a unique ID to the customer and adds them to the AVL tree for customer management.
* Administrators review the connection requests and accept them, providing the customer with the assigned ID.
* Customers receive their connection approval and can pay their bills using the system's payment functionality.
* Customers can register complaints regarding internet issues, which are prioritized based on the package type.
* Administrators handle complaints by resolving them in a timely manner, ensuring customer satisfaction.
* The system periodically updates the payment status and marks customers as unpaid when a new month starts.
* Administrators can block unpaid customers, restricting their internet access until payments are made.
* The system optimizes network connectivity using Prim's algorithm, finding the best routes between network locations.

1. **Conclusion:**

The Internet Service Provider (ISP) System provides a comprehensive solution for managing an internet service provider company. It facilitates customer registration, package management, billing, complaint handling, and network optimization. With its efficient data structures and algorithms, the system ensures smooth operations, customer satisfaction, and reliable internet connectivity.