**Project Overview: Shipment Management App**

This project involves the development of a delivery management system for Seneca Polytechnic, focusing on the efficient assignment and routing of shipments across a fleet of trucks. The system integrates several core components and functions, providing a comprehensive solution for handling deliveries within a mapped area.

**Core Functionality:**

1. **Truck and Route Initialization**:
   * The system initializes a fleet of trucks, each assigned to a specific route (Blue, Yellow, Green). The trucks are prepared with default capacities and ready to receive shipments.
2. **Shipment Assignment**:
   * A central function, assignShipmentToTruck, determines the best truck for each shipment based on proximity to the destination and available capacity. The function ensures that the trucks are utilized optimally, considering factors such as distance and load.
3. **Route Mapping and Diversions**:
   * Routes are carefully managed and updated as new shipments are assigned. If a direct route is unavailable, the system calculates the best diversion route to the destination, ensuring that deliveries are completed efficiently.
4. **Validation and User Input**:
   * The project includes robust validation functions to ensure that shipments meet the required criteria (e.g., weight, size, and destination). This ensures that only valid shipments are processed, reducing errors in delivery operations.
5. **Customer Interaction**:
   * The system prompts users (customers) to input shipment details, which are then validated and processed. The user receives feedback on whether the shipment can be handled by the available trucks.
6. **Capacity Management**:
   * The system dynamically updates the trucks' capacities as shipments are added, ensuring that no truck is overloaded. It also considers both weight and volume constraints, making informed decisions about whether a shipment can fit.
7. **Efficiency Optimization**:
   * The system includes a feature to find the nearest truck to a pickup location, optimizing the routing process. This minimizes travel distance and time, improving overall delivery efficiency.

**Conclusion:**

This project demonstrates a thorough approach to managing a fleet of delivery trucks, focusing on optimal shipment assignment, route management, and customer interaction. The system's ability to handle diversions, validate input, and manage capacity effectively ensures reliable and efficient delivery operations.