UC Name	*Inventory Forecasting and Replenishment*
Summary	Predicting future demand for car models and variants based on historical data and initiating replenishment orders to maintain optimal inventory levels.
Dependency	*Derived from Real-Time Inventory Management.*
Actors	Administrators/Managers
Preconditions	- Real-Time Inventory Management system is active and accurately tracking inventory. - Availability of historical sales data and inventory records. - Stable network infrastructure for data retrieval and communication with suppliers.
Description of the Main Sequence	**1. Data Analysis and Forecasting:** **- The system analyzes historical sales data, customer trends, and market demand.** **- Utilizes statistical methods or machine learning algorithms to forecast future demand for car models and variants.** **2. Replenishment Planning:** **- Based on demand forecasts, the system generates replenishment plans to restock inventory.** **- Considers factors such as lead times from suppliers, storage capacity, and budget constraints.** **3. Replenishment Order Generation:** **- The system automatically generates replenishment orders for items that are forecasted to be in high demand or are running low in stock.** **- Orders include details such as quantities, preferred suppliers, and delivery schedules.** **4. Supplier Interaction:** **- Replenishment orders are sent to suppliers through predefined communication channels (e.g., email, API).** **- Suppliers acknowledge receipt of orders and provide confirmation of expected delivery dates.** **5. Inventory Update:** **- Upon confirmation from suppliers, the system updates inventory status to reflect expected arrival dates and quantities of restocked items.** **- Adjusts stock levels accordingly to maintain optimal inventory levels.**
Description of the Alternative Sequence	*1. Inaccurate Forecasting:* *- If demand forecasting results in inaccuracies:* *- The system triggers a review process to analyze the reasons for discrepancies.* *- Adjusts forecasting models or parameters based on new data or insights.*
Nonfunctional requirements	*- Forecasting Accuracy: Ensure accurate prediction of demand to prevent overstocking or stockouts.* *- Replenishment Efficiency: Ensure timely generation and processing of replenishment orders.*

	- Scalability: Ensure the system can handle large volumes of data for accurate forecasting and efficient replenishment.
Postconditions	*Optimal inventory levels are maintained, ensuring availability of car models and variants to meet customer demand while minimizing excess inventory costs.*