S&E'S TECHNOLOGY SUPERSTORE DATA WAREHOUSE

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Data Types

Store:

Attribute	Data Type	Nullable
storeNumber	Integer	Not Null
phoneNumber	Integer	Null
streetAddress	String	Null

Manager:

Attribute	Data Type	Nullable
managerName	String	Not Null
managerEmail	String	Not Null

City:

Attribute	Data Type	Nullable
cityName	String	Not Null
State	String	Null
population	Integer	Null

Product:

Attribute	Data Type	Nullable
productId	Integer	Not Null
retailPrice	Float	Not Null
productName	String	Null

Manufacturer:

Attribute	Data Type	Nullable
manufatuererName	String	Not Null
manufacMaxDiscount	Float	Not Null

Category:

Attribute	Data Type	Nullable
categoryName	String	Not Null

Sale:

Attribute	Data Type	Nullable
saleDate	Date	Not Null
percentageDiscount	Integer	Not Null
holidayName	String	Null
quantityPurchased	Integer	Not Null

Business Logic Constraints

Product:

- All products are available and sold at all stores.

Sale:

- The data warehouse should disallow sale prices that are higher than retail prices.
- Retail prices is the product price unless there is a sale.
- If a product is on sale for multiple days in a row, then a record is stored in the data warehouse for each day of the sale.
- It is possible that the same product goes on sale multiple times (i.e., different days) with different sale prices.
- A manufacturer can set a maximum discount for their product that applies to all retailers
- Discount cannot be more that 90 percent of the product's retail price.
- A sale price for a given item is applicable to all the stores. Store specific sale prices for a given item are not allowed.
- A day is considered a holiday if there is a not null entry in the holidayName attribute

Main Menu / Navigation Bar

Task Decomp

Lock Types: all are Read-only.

Number of Locks: Single

Enabling Conditions: Trigger by successful login.

Frequency: User Detail and Menu Options have the same frequency.
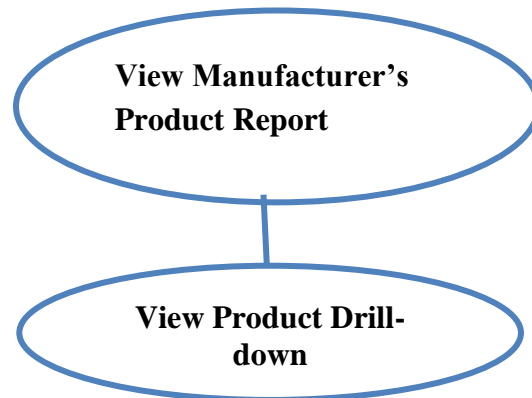
Consistency (ACID): not critical, order is not critical.

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code

- Show "**View Manufacturer's Product Report**", "**View Category Report**", "**View Actual versus Predicted Revenue for GPS units**", "**View Store Revenue by Year by State**", "**View Air Conditioners Sale on Groundhog Day**", "**View State with Highest Volume for each Category**", "**View Revenue by Population**" tabs, and "**Settings Form**".
- Click *View Manufacturer's Product Report* button- Jump to the **View Manufacturer's Product Report** task.
- Click *View Category Report* button- Jump to **View Category Report** task.
- Click *View Actual versus Predicted Revenue for GPS unit's* button- Jump to **View Actual versus Predicted Revenue for GPS unit's** task.
- Click *View Store Revenue by Year by State* button- Jump to the **View Store Revenue by Year by State** task.
- Click *View Air Conditioners Sale on Groundhog Day* button- Jump to **View Air Conditioners Sale on Groundhog Day** task.
- Click *View State with Highest Volume for each Category* button- Jump to **View State with Highest Volume for each Category** task.
- Click *View Settings Form* button- Jump to **Settings Form** task.

View Manufacturer's Product Report

Task Decomp

Lock Types: Read only on Manufacturer, Product

Number of Locks: Single

Enabling Conditions: None

Frequency: Unlimited

Consistency (ACID): is not critical

Subtasks: Mother Task is required to coordinate drill- down details subtask.

Abstract Code

- User clicked on *View Manufacturer's Product Report* button from User Login Screen:
- Run the **View Manufacturer's Product Report** task: query for information about the manufacturer and their products - manufacturer's ID, name, and total number of products offered by the manufacturer, average retail price of all the manufacturer's products, minimum retail price, and maximum retail price.

- Sort the results by average price with the highest average price appearing first, for only the top 100 manufacturers based on average price.
- User clicks the ***Manufacturer' id*** button:
- Run the **View product drill-down** task. Drill down will query the details of manufacturer and its product - the manufacturer's details (name and maximum discount), the summary information from the parent report, and lists for each of the manufacturer's products' its product ID, name, category (or categories), and price, ordered by price descending (high to low).
- When ready, the user selects next action from choices in **Main Menu**.

View Category Report

Task Decomp

Lock Types: Read only on Product, Category, Manufacturer

Number of Locks: Single

Enabling Conditions: None

Frequency: Unlimited

Consistency (ACID): is not critical

Subtasks: Mother Task is not required. No decomposition needed.

View Category
Report

Abstract Code

- User clicked on ***View Category Report*** button from user Login Screen:
- Run the **View Category Report** task: query for information about the category - category name, total number of products in that category, total number of unique manufacturers offering products in that category, and the average retail price (not including sale days) of all the products in that category.
- Sort the results by category name ascending.
- When ready, the user selects next action from choices in **Main Menu**.

View Actual versus Predicted Revenue for GPS units

Task Decomp

Lock Types: Read only for Product, Sale Instance, Store

Number of Locks: Single

Enabling Conditions: None

Frequency: Unlimited

Consistency (ACID): is not critical
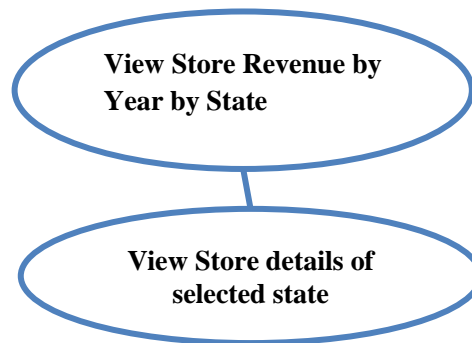
Subtasks: Mother task is not required

View Actual versus Predicted Revenue for GPS units

Abstract Code

- User clicked on **_View Actual versus Predicted Revenue for GPS units_** button from user Login Screen:
- Run the **View Actual vs Predicted Revenue** task: For each product in the GPS category, it returns the product ID, the name of the product, the product's retail price, the total number of units ever sold, the total number of units sold at a discount, the total number of units sold at retail price, the actual revenue collected from all the sales of the product, the predicted revenue had the product never been put on sale (based on 75% volume selling at retail price), and the difference between the actual revenue and the predicted revenue.
- Only predicted revenue differences greater than $5000 (positive or negative) will be displayed and sorted in descending order.
- When ready, the user selects next action from choices in **Main Menu**.

View Store Revenue by Year by State

Task Decomp

Lock Types: Read only on Store, City, Date/Instance of Sale

Number of Locks: Single

Enabling Conditions: None

Frequency: Unlimited

Consistency (ACID): is not critical

Subtasks: Mother Task is required to coordinate drill- down details subtask.

Abstract Code

- User clicked on ***View Store Revenue by Year by State*** button from user Login Screen:
- Run the **View Store Revenue by Year by State** task: Display all the states in the Drop-down box.
- Upon selection of the specified state:
- Display store ID, store address, city name, sales year, and total revenue for all stores in the selected state
- Revenue calculation must take into account items that were sold at a discount.

- Sort the report first by year in ascending order and then by revenue in descending order.
- When ready, the user selects next action from choices in **<u>Main Menu</u>**.

View Air Conditioners Sale on GroundHog Day

Task Decomp

Lock Types: Read only on Sale Instance, Product

Number of Locks: Single

Enabling Conditions: None

Frequency: Unlimited

Consistency (ACID): is not critical
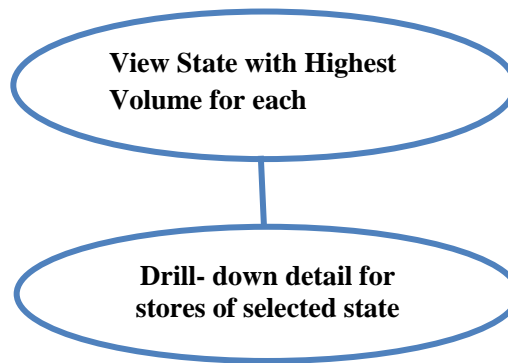
Subtasks: Mother Task is not required.

View Air Conditioners
Sale on Groundhog Day

Abstract Code

- User clicked on *View Air Conditioners Sale on GroundHog Day* button from user Login Screen:
- Run the **View Air Conditioners Sale on GroundHog Day** task: Display the year, the total number of items sold that year in the air conditioning category, the average number of units sold per day, and the total number of units sold on Groundhog Day (February 2) of that year.
- Sort the report on the year in ascending order.
- When ready, the user selects next action from choices in **Main Menu**.

View State with Highest Volume for each Category

Task Decomp

Lock Types: Read only on City, Store, Sale Instance, Product, Category

Number of Locks: Single

Enabling Conditions: None

Frequency: Unlimited

Consistency (ACID): is not critical

Subtasks: Mother Task is required to coordinate drill- down details subtask.

Abstract Code

- User clicked on ***View State with Highest Volume for each Category*** button from user Login Screen:
- Select a year and month from the available dates in the database.
- Run the **State with Highest Volume for each Category** task: For each category: the category name, the state that sold the highest number of units in that category (i.e., include items sold by all stores in the state), and the number of units that were sold by stores in that state.

- This output shall be sorted by category name ascending. Note that each category will only be listed once unless two or more states tied for selling the highest number of units in that category.
- User clicks ***drill-down detail*** button for category:
- Drop-down detail for each row uses the criteria of state, category, and year/month to provide the IDs, names, and cities of all the stores and their managers names and email addresses so that they can be recognized for their efforts.
- This sub report is ordered by store ID ascending and the header includes the original criteria from the parent report (category, year/month, state).
- If there is more than one manager, it is displayed as multiple rows.
- When ready, the user selects next action from choices in **Main Menu**.

View Revenue by Population

Task Decomp

Lock Types: Read only on City, Sale Instance, Product, Store

Number of Locks: Single

Enabling Conditions: None

Frequency: Unlimited

Consistency (ACID): is not critical
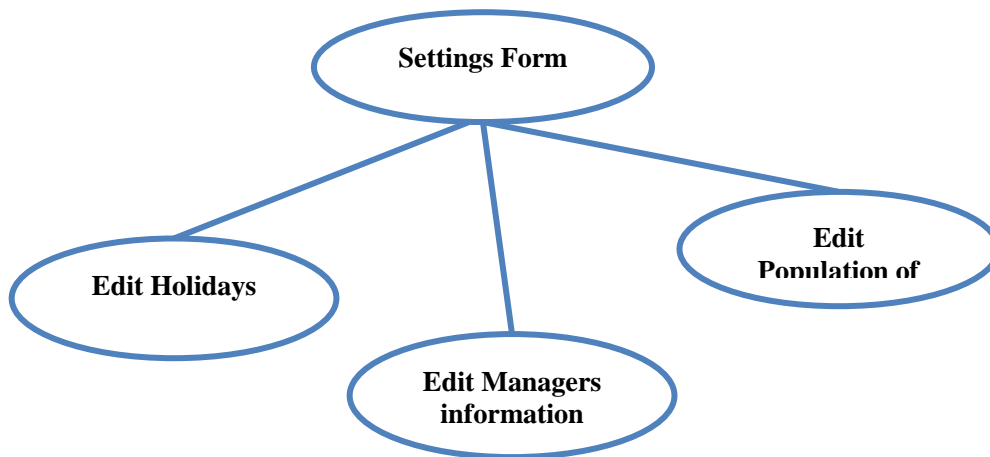
Subtasks: Mother Task is not required.

View Revenue by Population

Abstract Code

- User clicked on "**View Revenue by Population**" button from user Login Screen:
- Run the View Revenue by Population task: Display a pivot table with years or city category as columns or as rows, with both attributes arranged in ascending order (oldest to newest for years, smallest to largest for city size).
- When ready, the user selects next action from choices in **<u>Main Menu</u>**.

Settings Form

Task Decomp

Lock Types: Read and Write Access for Sale Instance, Manager, City

Number of Locks: Single

Enabling Conditions: None

Frequency: Unlimited

Consistency (ACID): is not critical

Subtasks: Mother Task is required to coordinate drill- down details subtask.

Abstract Code

- User clicked on *Settings Form* button from user Login Screen:
- **Settings** form displays. Show "Edit Holidays", "Edit Manager's Information", and "Edit Population of Cities" tabs. Upon:
- Click *Edit Holidays* button- Jump to the Edit Holidays task.
- Click *Edit Manager's Information* button- Jump to Edit Manager's Information task.
- Click *Edit Population of Cities* button- Jump to Edit Population of Cities task.