Phase 1 Report CS6400- Team 0041

Data types

USER

Attribute	Data type	Nullable	Key
UID	Integer	Not Null	Primary Key
Password	String	Not Null	
CORPORATE USER	Boolean	Null	
STORE MANAGER	Boolean	Null	
MARKETING USER	Boolean	Null	

STORE

Attribute	Data type	Nullable	Key
Store_Number	Integer	Not Null	Primary Key
Phone No.	String	Not Null	
Street Address	String	Not Null	

PRODUCT

Attribute	Data type	Nullable	Key
PID	Integer	Not Null	Primary Key

SHOWCASE STORE

Attribute	Data type	Nullable	Key
In-Store Demo	Boolean	Null	
Delivery/Assembly Services	Boolean	Null	

CITY

Attribute	Data type	Nullable	Key
City_Name	String	Not Null	Primary Key

STATE

Attribute	Data type	Nullable	Key
State_Name	String	Not Null	Primary Key

SALES

Attribute	Data type	Nullable	Key
Date_of_Sale	Date	Not Null	Primary Key
Quantity	Integer	Not Null	
Total Sales	Integer	Null	

DISCOUNT PRICE

Attribute	Data type	Nullable	Key
Discount_price	Integer	Not Null	

RETAIL PRICE

Attribute	Data type	Nullable	Key
Retail_price	Integer	Not Null	

DATE

Attribute	Data type	Nullable	Key
Calendar Date	Date	Not Null	Primary Key

SALES DATE

Attribute	Data type	Nullable	Key
Special Saving Date	Date	Not Null	

DISCOUNT DATE

Attribute	Data type	Nullable	Key
Discount_ Date	Date	Not Null	Primary Key

CATEGORY

Attribute	Data type	Nullable	Key
Category_Name	String	Not Null	Primary Key

MANUFACTURER

Attribute	Data type	Nullable	Key
Unique_Name	String	Not Null	Primary Key

Business Constraints

USER

- Read - only corporate users - view only for all stores
- Store manager - view data for the stores or stores they manage
- Marketing users - view reports for all stores to change certain values in the system

Category

- N/A

City

- N/A

Manufacturer

- N/A

Product

- Products that have manufacturers that have a maximum discount of percentage of 0% can not be on sale.

Sales

- Sale prices of products can not be higher than the retail price.
- Sale price discounts of products can not exceed the maximum discount percentage of the product's manufacturer.
- Pricing errors may occur and should not be corrected.

Store

- Stores are not allowed to hold sales independently.

Date

- N/A

Task Decomposition & Abstract Code

Display Statistics for Main Menu

Task Decomp

Lock Types: 4 Read-only lookups on count of products, stores, manufacturers, and memberships
Number of Locks: Several different schema constructs are needed
Enabling Conditions: None
Frequency: Frequent
Consistency (ACID): Not critical
Subtasks: Tasks may be done in parallel, and order is not necessary, a mother task is required to coordinate subtasks

Abstract Code

- Run the ***Display Statistics*** task
    - Count and display the number of stores
    - Count and display the number of manufacturers
    - Count and display the number of products
    - Count and display the number of Grand Showcase store
- Upon:
    - Click ***Manufacturer report*** button – jump to the **Return manufacturers' summary** task
    - Click ***Category report*** button – jump to the **Return category summary** task
    - Click ***Predicted vs actuals report*** button – jump to the **Return ACTL vs PRED sales** task
    - Click ***Store revenue report*** button – jump to the **Return revenue by store** task & **Return states list** task
    - Click ***Groundhog day report*** button – jump to the **Return AC sales** task
    - Click ***Highest vol. per category report*** button – jump to the **Return year & month list** task & **Return category/state volumes** task
    - Click ***Revenue by population report*** button – jump to the **Return trend by city size** task
    - Click ***Grand Showcase*** button – jump to the **Show *Grand Showcase* by year** task & **Show non-*Grand Showcase* by year** & **categories/products** task
    - Click ***View/update Special saving form*** button – jump to the **View/add special saving date** task
      jump to the **View/add special saving date** task
    - Click ***Update city population form*** button – jump to the **Update city population** task

View/Update Grand Showcase

Task Decomp

Lock Types: 2 types of locks needed, lookup and insert
Number of Locks: Single

Enabling Conditions: User clicks on Click ***View/update Grand Showcase form*** button; user clicks update button
Frequency: Infrequent
Consistency (ACID): Not critical
Subtasks: Lookup task should be done first, then if needed the update task, thus, decomposition needed

Abstract Code

- Run the **View/Add Grand Showcase** task
  - Subtask 1: **Retrieve and display list of Grand Showcase** by product ID and product name
  - Upon clicking Update button:
    - Subtask 2: **Update Grand Showcase table** to compare Grand Showcase QTY and Regular Qty
    - Refresh list of top five and bottom five

Update City Population

Task Decomp

Lock Types: 1 lock needed for insert
Number of Locks: Single
Enabling Conditions: User clicks ***Update city population form*** button; user clicks update button
Frequency: Infrequent
Consistency (ACID): Not critical
Subtasks: Mother task is not needed. No decomposition needed.

Abstract Code

- Upon clicking Update button:
  - Run the **Update city population** task
    - Update city population table with population information for a given city entered by the user

Report 1 – Manufacturer's Product Report

Task Decomp

Lock Types: 1 lock needed for read-only
Number of Locks: Single
Enabling Conditions: User clicks ***Manufacturer report*** button from main menu
Frequency: Frequent
Consistency (ACID): Not critical
Subtasks: Mother task is not needed. No decomposition needed.

Abstract Code

- Run the **Return manufactures' summary** task

- For each manufacture:
    - For sale days the products not discounted
        - Return manufacturer's name
        - Count total number of products
        - Return minimum/maximum retail price across all products in that manufacture
        - Calculate the average retail price across all products in that manufacture
- Sort by average retail price descending from top manufacture

Report 2 – Category Report

Task Decomp

Lock Types: 1 lock needed for read-only
Number of Locks: Single
Enabling Conditions: User clicks ***Category report*** button from main menu
Frequency: Frequent
Consistency (ACID): Not critical
Subtasks: Mother task is not needed. No decomposition needed.

Abstract Code

- Run the **Return category summary** task
    - For each category name:
        - Count total number of products
        - Count total unique manufacturers offering products in that category
        - Calculate the average retail price across all products in that category
    - sort by category name ascending

Report 3 – Actual versus Predicted Revenue for Couches and Sofas

Task Decomp

Lock Types: 1 lock needed for read-only
Number of Locks: Several different schema constructs are needed
Enabling Conditions: User clicks Predicted ***vs actuals report*** button from main menu
Frequency: Frequent
Consistency (ACID): Not critical
Subtasks: Order matters, need to populate actual revenue first based on discount, then populate predicted revenue based on retail price with 75% volume to get the differences between actual revenue and predicted revenue

Abstract Code

- Run the **Return ACTL** vs. **PRED** sales task
    - For each product in "Couches and Sofas" category:

  - Return Product ID
  - Return the name of the product
  - Return the retail price of the product
  - Return the total number of units sold of that product
  - Distinguish between on-sale date and others
    - Use 0.75 adjustment factor only calculated on sale days
    - Sum both predicted revenue and actual revenue with the rest days without sales
    - Calculate the difference between actual revenue and predicted revenue.
    - Display the differences between actual revenue and predicted revenue > $5000 (positive or negative)

- Sort by the difference between actual revenue and predicted revenue descending

Report 4 – Store Revenue by Year by State

Task Decomp

Lock Types: 1 lock needed for read-only

Number of Locks: Several different schema constructs are needed

Enabling Conditions: User clicks Store revenue report button from main menu

Frequency: Frequent

Consistency (ACID): Not critical

Subtasks: Order matters, need to populate state drop down box first, then populate report with revenue by store by year for the given state

Abstract Code

- Run the **Return revenue by store** task
  - Run the **populate state dropdown** subtask
    - Fetch unique states from database
  - Run the **return revenue for each state by year subtask**
    - For the selected states:
      - For each store in state:
        - Lookup store ID, address, city name
        - For each year:
          - Sum revenue collected

  - Sort by year ascending

- Sort by the difference between actual revenue and predicted revenue descending

Report 5 – Outdoor Furniture on Groundhog Groundhog Day?

Task Decomp

Lock Types: 1 lock needed for read-only

Number of Locks: Single

Enabling Conditions: User clicks outdoor furniture on Groundhog Day report button from main menu

Frequency: Annually

Consistency (ACID): Not critical

Subtasks: No additional subtasks required.

Abstract Code

- Run the **Return outdoor furniture *on Groundhog Day's* summary** task
  - Group transactions of outdoor furniture categorized product transactions by year:
    - Return Year.
    - Return sum of quantity of product units under the outdoor furniture category that were sold that year.
      - Return daily average number of products units under the outdoor furniture category that were sold by dividing the annual total by 365.
    - Return quantity of product units under the outdoor furniture category that were sold on Groundhog day (February 2).
  - Sort by year in ascending order

Report 6 – State with Highest Volume for each Category

Task Decomp

Lock Types: 1 lock needed for read-only

Number of Locks: Several different schema constructs are needed

Enabling Conditions: User clicks State with Highest Volume for each report button from main menu

Frequency: monthly

Consistency (ACID): Not critical

Subtasks: Order matters, need to populate the month and year from the available dates in the database. Then populate the report with the category name, the state that sold the highest number of units in that category and the number of units that were sold by stores in that state.

Abstract Code

- Run ***state with highest volume*** task
  - Run the **populate available month and year dropdowns** subtask
    - Fetch unique available dates
  - Run the **get category max sales for state** subtask:
    - For the selected date :
      - For each state in state within time range:
        - For each category:
          - Sum volume sold
          - return state with max(volume)
  - Sort by category name ascending

Report 7 – Revenue by Population

Task Decomp

Lock Types: 1 lock needed for read-only

Number of Locks: Several different schema constructs are needed

Enabling Conditions: User clicks ***Revenue by Population*** for each report button from main menu

Frequency: Frequent

Consistency (ACID): Not critical

Subtasks: OrderMatters, need to first populate the city population category. Then we will need to first calculate revenue by year. Then for each city calculate the revenue. Then apply categories to only include cities within that population category.

Abstract Code

- Run **calculate revenue by year** task
  - Run the **calculate revenue for each city** subtask
    - Fetch each city revenue on an annual basis
  - Run the **display population category state** subtask:
    - For the selected category :
      - For each city in city within population range:
        - City Size broken down:
          - Small (population < 3,700,000)
          - Medium (population >= 3,700,000 and < 6,700,000)
          - Large (population > = 6,700,000 and < 9,000,000)
          - Extra Large(population >=9,000,000)
        - Sum revenue sold
  - Sort by city size ascending, sort ascending year

Report 8 – Grand Showcase Store Revenues Comparison

Task Decomp

Lock Types: 1 lock needed for read-only

Number of Locks: Several different schema constructs are needed

Enabling Conditions: User clicks ***Revenue of Grand Showcase*** for each report button from main menu

Frequency: Frequent

Consistency (ACID): Not critical

Subtasks: Order Matters, need to first populate the Grand Showcase stores/normal Will-Mart stores. Then we will need to first calculate revenue by year. Then for the Grand Showcase stores/normal Will-Mart stores calculate the revenue including minimum, average and maximum and total revenues, count the number of Grand Showcase stores/normal Will-Mart stores. Finally calculate the minimum, average, total revenue of the Grand Showcase stores/normal Will-Mart stores.

Abstract Code

- Run **calculate the Grand Showcase stores/normal Will-Mart revenue by year** task
  - Run the **calculate counts** subtask
    - Count the total number of Grand Showcase stores
    - Count the total number of Will-Mart stores
  - Run the **display Grand Showcase stores/normal Will-Mart revenue** subtask
    - Calculate the minimum, average, maximum and total revenue of all Grand Showcase stores.
    - Calculate the minimum, average, maximum and total revenue of all Will-Mart stores.
  - Sort by ascending year

Report 9 – Grand Showcase Store Category Comparison

Task Decomp

Lock Types: 1 lock needed for read-only
Number of Locks: Single
Enabling Conditions: User clicks ***Grand Showcase Store Category Comparison report*** button from main menu
Frequency: Frequent
Consistency (ACID): Not critical
Subtasks: Mother task is not needed. No decomposition needed.

Abstract Code

- Run **Grand Showcase Store Category Comparison *report*** task

- For each product:
    - Display Product ID
    - Display Product Name
    - Count the number of each product sold by Grand Showcase stores
    - Count the number of each product sold by Will-Mart stores
    - Subtract the numbers of each product sold by Grand Showcase stores from the numbers of each product sold by Will-Mart stores to obtain the differences
- Run **Show Grand Showcase Store Category Comparison drill down** subtask:
    - Display top five of Product ID, Product Name, Grand Showcase Qty, Regular Qty and Difference
    - Display bottom five of Product ID, Product Name, Grand Showcase Qty, Regular Qty and Difference
- Sort by difference in descending order, product ID in ascending order