Internship

Assessment

Tasks

Part-1

MS Excel Task

Use **“sales.csv”** and **“return_table.csv”** files to complete the following tasks in Microsoft Excel.

Task – 1

- Load those 2 files in Excel. Do necessary transformation by Power Query, if needed.
- Create the following dimension tables from ***“sales”*** table using power query:
  - **Location** (Reference Primary Key from *“sales [City]”*) – You must include city, state, country, and continent names in this table.
  - **Product** (Reference Primary Key from *“sales [Product ID]”*) – You must include product id, name, category and subcategory names in this table.
  - **Date** (Reference Primary Key from *“sales [Order Date]”*) – You must include start of month, month name, start of week, Day Name, and Year.
- Perform Data Modelling between dimension tables (*return_table, location, product, Date*) and fact table (*sales*) using Power Pivot.
- Create 4 new pivot tables from data model to perform ***Task-2*** to ***Task-5***.

Task – 2

a) Rename the new sheet as ***“Product Analysis”***
b) Use DAX measure to find out the “***Total Order Quantity***”
c) Use DAX measure to find out the “***Total Returned Order Quantities***”
d) Use stacked bar chart or two column chart to plot both findings from **(b)** & **(c)**, for different product subcategories. You must use the subcategory names from the “Product” table.

Task – 3

a) Rename the new sheet as ***“Regional Sales”***
b) Find out the following DAX measures:
   i. Total Costs *(should consider all types of cost)*
   ii. Total Revenues *(should minimize the discounted price from actual price)*
   iii. Total Profits
   iv. Profit Margin %
   v. Average Order Value
b) Show the values of all KPIs in **(b) (**like card visuals in Power BI)

c) Create a map visual to present total orders placed by different countries
d) Create a Continent slicer. Make sure that the slicer can filter all the visuals in this page.

Task – 4

a) Rename the new sheet to **"Logistics Insights"**.
b) Create a DAX measure named "Average Shipping Days"
    - Create a Pivot Table showing Average Shipping Days and Profit Margin (%) by Shipping Mode and Product Category.
    - Apply conditional formatting to the Pivot Table values for better visual interpretation.
c) Create another DAX measure named **"**Correlation (Revenue vs. Shipping Days)**".** (*Use Mathematical formula to calculate it*)
d) Visualize the correlation by **Country Hierarchy (*Country, State, City*)** using a pivot table. Put conditional formatting on it (*Green color for >0, Red color for <0, and Yello color for =0*)
e) Use a Continent slicer to filter both tables.

Task – 5

a) Rename the new sheet as ***"Time-series Analysis"***
b) Based on the sales measure created in **Task-3**, create the following measures:
    i. Cumulative profit (Running total) by order dates
    ii. Weekly Order Growth %
    iii. Monthly Rolling Revenue
c) Create an Area chart for the measure **b(i)** by Start of Week
d) Create a Waterfall chart for the measure **b(ii)** by Start of Month
e) Create a Treemap for the measure **b(iii)** by Quarters (put quarter name as Q1, Q2, Q3, Q4 for a whole year). Keep only *values* as data lebel.
f) Create a slicer on Year-Quarter (Example: *2022-Q3*) to only filter visual **(c) and (d)**.
g) Create a Year slicer to only filter visual **(e)**.

(After completing all the tasks, you must submit the Output Excel file in the reply of your mail)

Part-2

Power BI Task

Task – 01

Load 2 datasets ***"sales.csv"*** and ***"return_table.csv"*** in Power BI.

Task – 02

Create the following Dimension Tables from ***"sales"*** fact table :

- **Date** (Reference Primary Key from *"Sales [Order Date]"*)
- **Region** (Reference Primary Key from *"Sales [City]"*)
- **Product** (Reference Primary Key from *"Sales [Product ID]"*)
- **Product Sub-Category** (Reference Primary Key from *"Sales [Sub-Category]"*)
- **Product Category** (Reference Primary Key from *"Sales [Category]"*)

Task – 03

Create a data model in Power BI Model View via following Rules:

- Create a "Star Schema" model using tables ***"Date"***, ***"Region"***, & ***"Return"*** with the fact table ***"Sales".***
- Create a "Snowflake Schema" model using tables ***"Product"***, ***"Product Sub-Category"***, & ***"Product Category"*** with the fact table ***"Sales".***

Task – 04

Create the following calculated columns in ***"Sales"*** table:

- Cost (Total Product & Shipping Cost)
- Revenue (Product price without the discounted price)
- Profit (Difference between Cost & Revenue)

Task – 05

Create a Power BI report with 4 report pages.

Page-1: Homepage

1. Create a text/shape visual to highlight the title of this report. The title should be **"E-commerce Sales Analysis"**.

2. Create 3 different page navigation button visuals, so that user can navigate the other 3 pages from this page.

Page-2: Executive Page

1. Use card visuals to show the following KPIs:
    a. Total Orders
    b. Total Order Quantities
    c. Total Products
    d. Total Revenues
    e. Total Profits

2. Create the following 2 Donut Charts & make sure data labels (values & percentages) are visible in both charts:
    a. Different shipping mode based on total revenues
    b. Different customer segment based on total orders

3. Create a column chart for different continents based on total profits. Use tooltips to show the total number of countries and cities in each continent column.

4. Create a summary table of *total products*, *total orders*, *total order quantities*, *total costs*, *total revenues*, and *total profits* for each product sub-category.

5. Create a date slicer containing all the available order dates, keep the slicer style "Between", and make sure that all other visuals on this page should only be filterable by this slicer.

Page-3: Regional Order Page

1. Create a Donut chart for different order priorities based on total orders.

2. Create a map visual by following rules:
    a. The bubble size of the map should be varied by the amount of order quantities.
    b. Set up the map location in such a way that user can drill down to following orders: *country -> state -> city*.
    c. Put total revenues in the tooltips.

3. Create a bar chart that displays the top 5 cities with the highest order quantities. Include tooltips for each bar to show the percentage of order quantities for that city in relation to the overall order quantities.

4. Create a slicer containing all the continents in this dataset. Make sure that all other visuals on this page should only be filterable by this slicer.

Page-4: Sales Page

1. Use card visuals to show the following KPIs:
    a. Total Costs
    b. Total Costs Returned
    c. Total Revenues
    d. Total Revenues Returned
    e. Total Profits
    f. Total Profits Returned
    g. Profit Margin %

    (**Hint:** Use *"Return"* table to calculate all returned transactions)

2. Create a summary table using these KPIs for each start of month. Use Data bars in each KPI column.

3. Create an area chart representing total revenues for all the available dates in the dataset. Make sure that user can drill down the visual or any point in the chart to following orders: *Start of Month -> Start of Week -> Date*.

4. Create a slicer containing all the product names in this dataset. Make sure that all other visuals on this page should only be filterable by this slicer.

Task – 06

Add two buttons in each of the last 3 pages (*Executive Page*, *Regional Order Page*, *Sales Page*):

- First button is for returning to the Homepage (Page-1)

- Second button is for returning to the default view of that page (when user click on this button, he/she should see the default view of that page without any slicer filtering).

[After completing all the tasks, you must submit the output Power BI (.pbix) file in the reply of your mail]

Part-3

SQL Task

Task – 01: *Data Ingestion and Normalization*

- Load the ***sales.csv*** data using ***infile*** method.
- Normalize and populate data into ***dimensional models*** via ***stored procedure***.
  - Create ***dimension tables*** (dim_location, dim_product, dim_category, dim_sub_category).
  - Create the ***fact_transaction*** table with foreign key references.
- Task-3: Load the ***return_table.csv*** data using the ***table data import wizard*** method.

Task – 02: *Business Questions*

Please read the following questions carefully and answers them using **MySQL**:

1. What is the total gross revenue?
2. What is the total net revenue?
3. What is the total profit?
4. How many orders were placed by each customer segment?
5. What are the top 5 best-selling products by quantity?
6. What is the monthly gross revenue trend for 2015?
7. Which sub-category has the highest profit margin?
8. Which continents experience the most product returns as a percentage of total products sold?
9. Which products have a negative profit?
10. How does discount percentage correlate with order volume?
11. What is the return rate by product category?
12. Which shipping mode is most profitable?

13. What percentage of orders are high priority?
14. Which city generates the highest revenue per order?
15. What is the average profit per customer segment?
16. What is the year-over-year (YoY) revenue growth by category?
17. Which products are frequently purchased together?
18. What percentage of orders contain multiple products?
19. Which orders have abnormally high shipping costs?
20. How are orders distributed by value segments (Low/Medium/High)?

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After completing all the tasks, you must submit the following files in the reply of your mail:

- The SQL file (.sql), for **Task-1**
- A doc file with your codes and output screenshots, for **Task-2**

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