CREATING A COMPREHENSIVE EXPLORATORY DATA ANALYSIS (EDA) REPORT FOR GLOBAL ELECTRONICS

OBJECTIVE

To uncover insights into customer demographics, purchasing behaviours, product performance, store operations, and the impact of currency fluctuations on sales. Highlight the ultimate goal of leveraging these insights to inform marketing strategies, inventory management, sales forecasting, product development, and store operations.

DATA CLEANING

1. Handling missing values

Sales Dataset

a) Dropped **'Delivery_Date'** column since 79% of the data were missing

Stores Dataset

a) '**Square Meters**' column has one missing value for **'online'** stores, for which having **'Square Meters'** doesn't makes sense so replaced it with **'0'**

Customers Dataset

a) The column **'State Code'** having '**NA'** as State code for the state '**Napoli**' Which was mistaken as '**Nan'** while reading the csv file into the jupyter notebook

b) Thus imputed the null values with string "NA"

DATATYPE COVERSIONS

Sales Dataset

Converted **'Order_date'** column to date format

Stores Dataset

Converted **'Open_date'** column to date format

Customers Dataset

Calculated **'Age'** column from birthday column

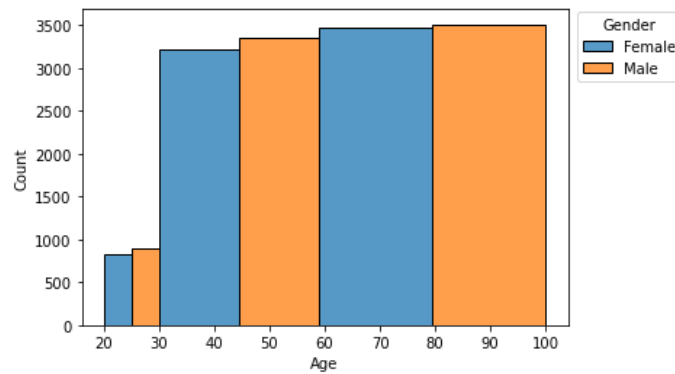#### Product dataset
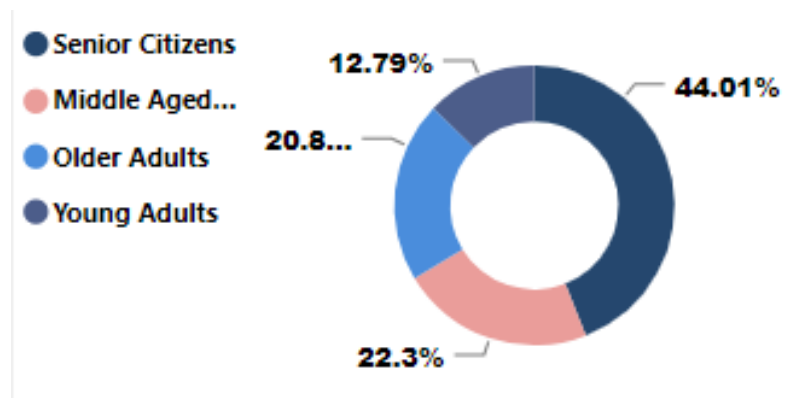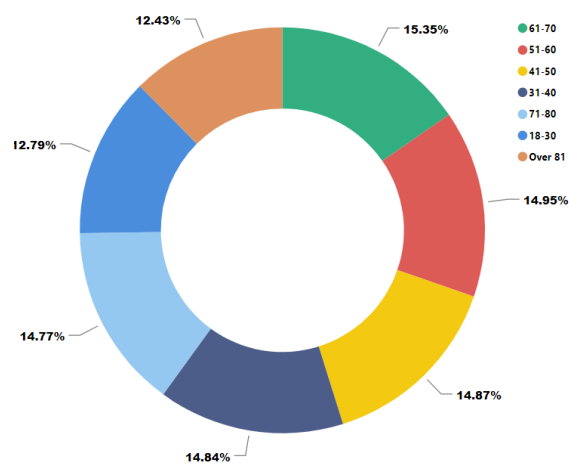
Converted Unit_Cost_USD and Unit_Price_USD to numeric

CUSTOMER ANALYSIS

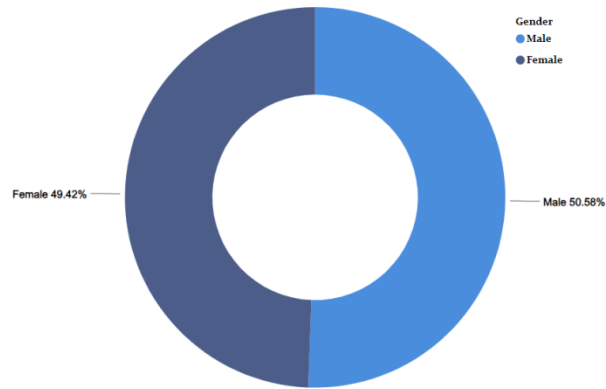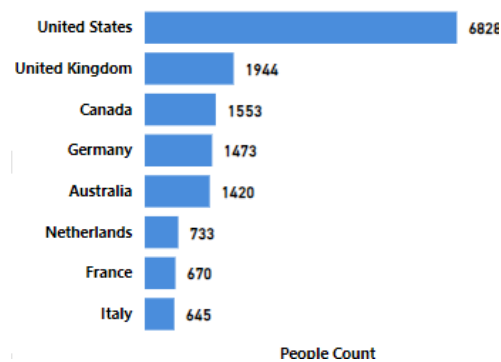### a) Customer distribution Based on Age and Gender :

Using Histogram

Using Pie-chart

Gender
- Male
- Female

Female 49.42%

Male 50.58%

DISTRIBUTION OF CUSTOMERS BASED ON LOCATION

Location	People Count
United States	6828
United Kingdom	1944
Canada	1553
Germany	1473
Australia	1420
Netherlands	733
France	670
Italy	645

b) **Purchasing pattern**

Average order value (yearly)
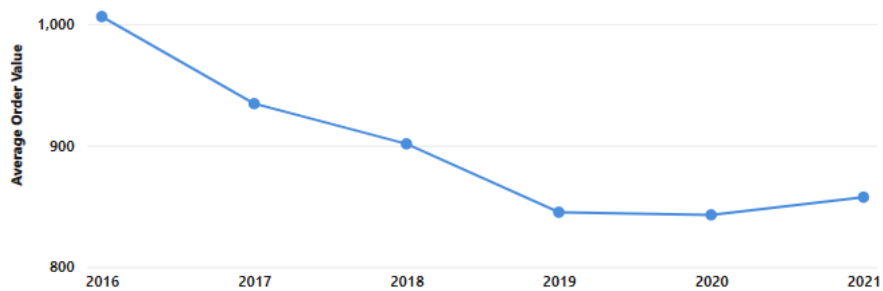
Average order value (monthly)

AVERAGE ORDER VALUE BASED ON AGESEGMENTATION

● Adults ● older Adults ● Young Adults
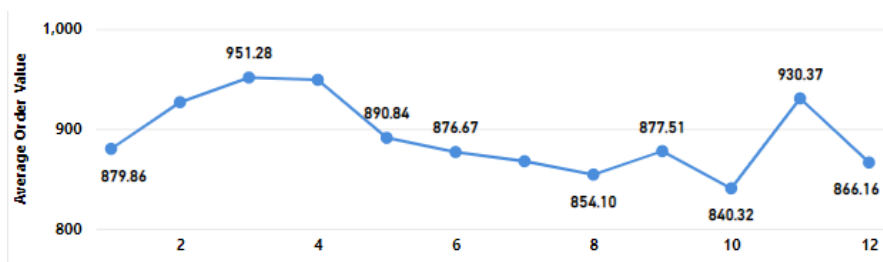

874.20   886.75   890.33

Average Order Value
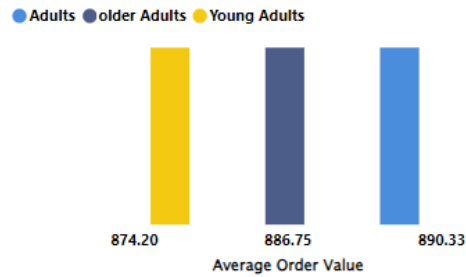
PURCHASE FREQUENCY OF CUSTOMERS EVERY YEAR
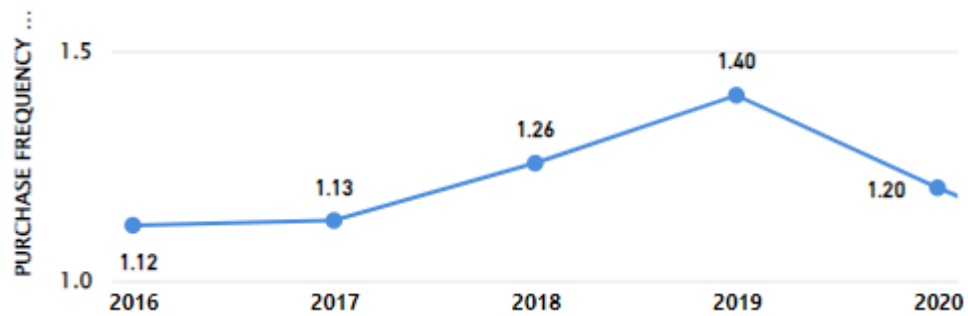
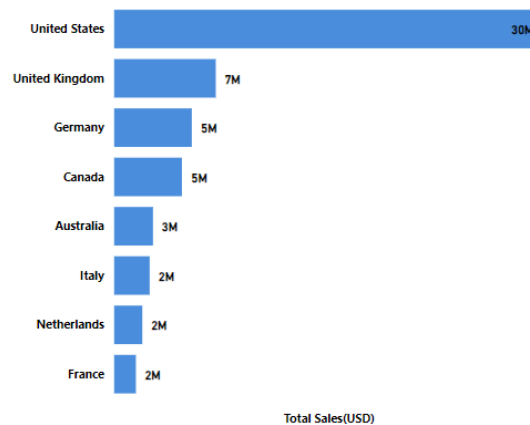| NAME	PURCHASE FREQUENCY	Sum of year(Order_date)
Aaron Hughes	3	2020
Aaron Taylor	3	2019
Abby Plowman	3	2019
Abigail Parker	3	2018
Adam Šimon	3	2018
Adam Cook	3	2020
Adam Holyman	5	2019
Adina Lindholm	3	2018
Al James	4	2019
Alannah McAuley	3	2019
Albert Pickney	3	2019
Alex Nixon	3	2019
Alex Stewart	4	2019
Alexander Eberhart	3	2018
Alexander Kelynack	3	2019
Alfonsina Piazza	5	2019
Ali Mahlum	3	2017
Alice Coleman	3	2018
Alice Patton	4	2018
Alice Potts	3	2018
Alicia Stewart	3	2019
Alton Perkins	3	2019
Amanda Davis	3	2019
Amanda Schou	3	2019
Amanda Tobin	3	2019
Ambretta Gallo	3	2019
Amos Carter	3	2019
Andrea McMurray	4	2019
Total	2603	1617022

SALES ANALYSIS

TOP PRODUCTS IN TERMS OF QUANTITY SOLD AND REVENUE GENERATED

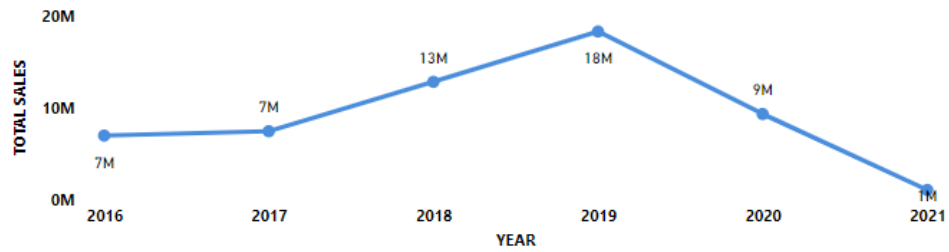| Product_Name	Sum of Quantity
WWI Desktop PC2.33 X2330 Black	550
WWI Desktop PC1.80 E1800 White	538
Adventure Works Desktop PC1.60 ED160 Black	521
Adventure Works Desktop PC2.30 MD230 White	521
Adventure Works Desktop PC1.80 ED180 Black	520
Adventure Works Desktop PC2.30 MD230 Black	514
WWI Desktop PC1.60 E1600 Black	509
WWI Desktop PC1.60 E1600 Silver	507
Adventure Works Desktop PC1.60 ED160 White	505
WWI Desktop PC1.80 E1801 Black	505

TOP PRODUCTS BASED ON PROFIT MARGIN

PROFIT MARGIN OF EACH PRODUCT

Product_Name	Sum of profit_margin in USD
WWI Desktop PC2.33 X2330 Black	0.34M
Adventure Works Desktop PC2.33 XD233 Silver	0.31M
Adventure Works Desktop PC2.33 XD233 Brown	0.31M
Adventure Works Desktop PC2.33 XD233 Black	0.3M
Adventure Works Desktop PC2.33 XD233 White	0.29M
WWI Desktop PC2.33 X2330 White	0.28M
WWI Desktop PC2.33 X2330 Brown	0.28M
Adventure Works 52" LCD HDTV X590 White	0.26M
Adventure Works 52" LCD HDTV X590 Black	0.25M
WWI Desktop PC2.33 X2330 Silver	0.24M

TOTAL SALES FOR EACH LOCATION

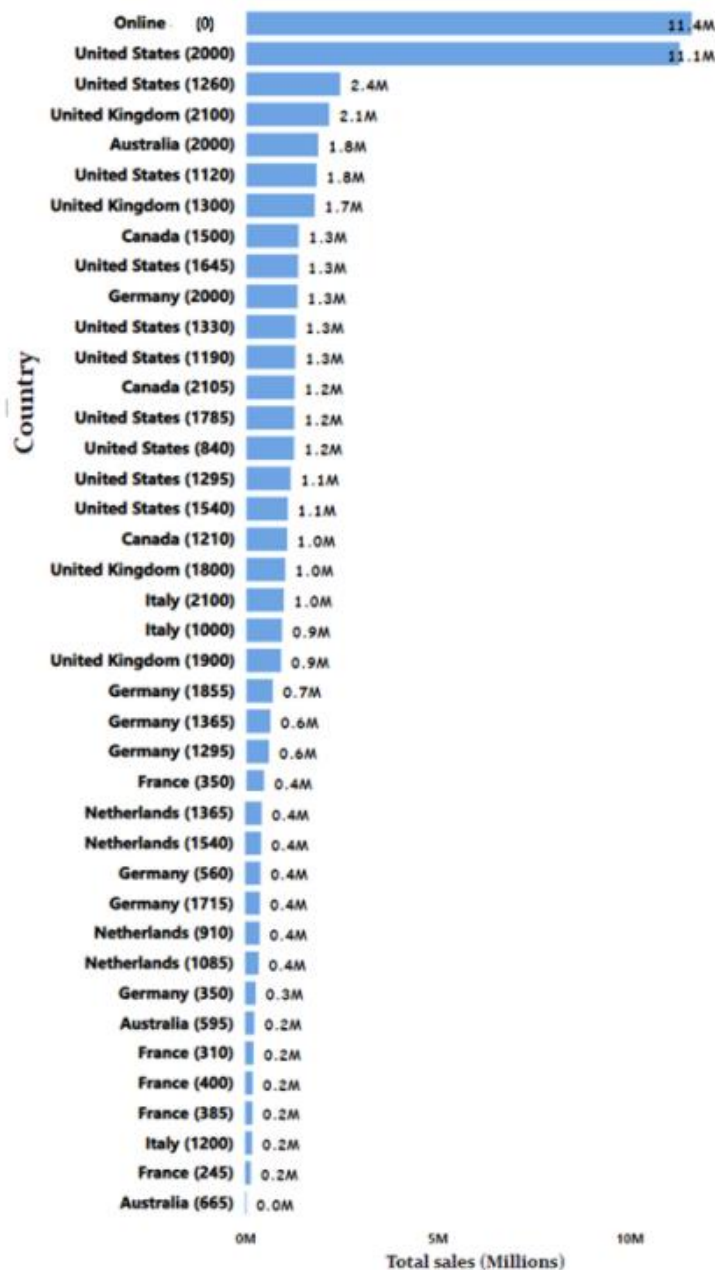| Location	Total Sales(USD)
United States	30M
United Kingdom	7M
Germany	5M
Canada	5M
Australia	3M
Italy	2M
Netherlands	2M
France	2M

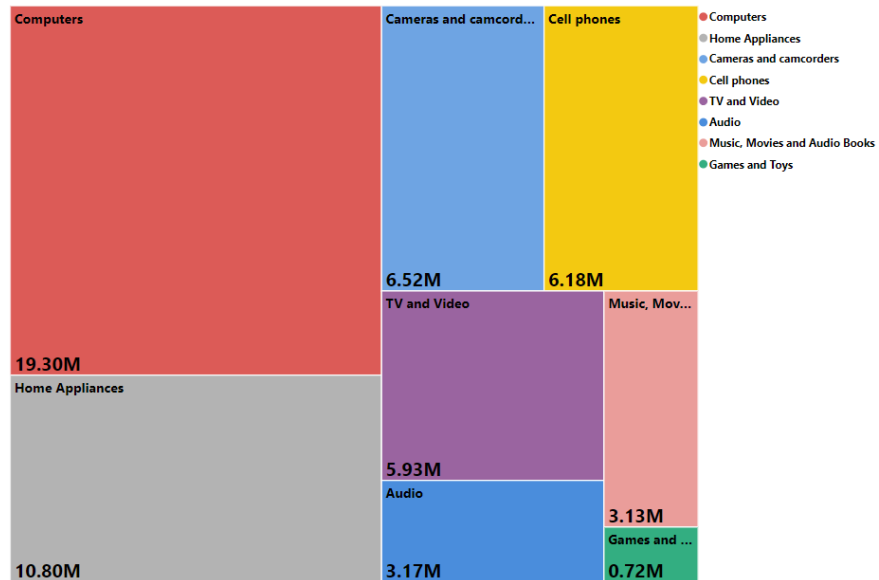# SALES OVER TIME

STORE ANALYSIS

a) STORE PERFORMANCE

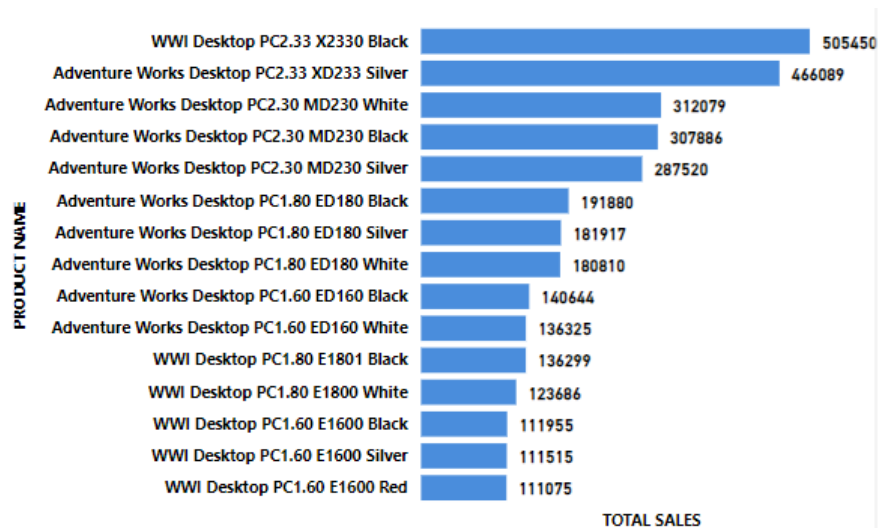### High performing stores with respect to location and size

PRODUCT ANALYSIS

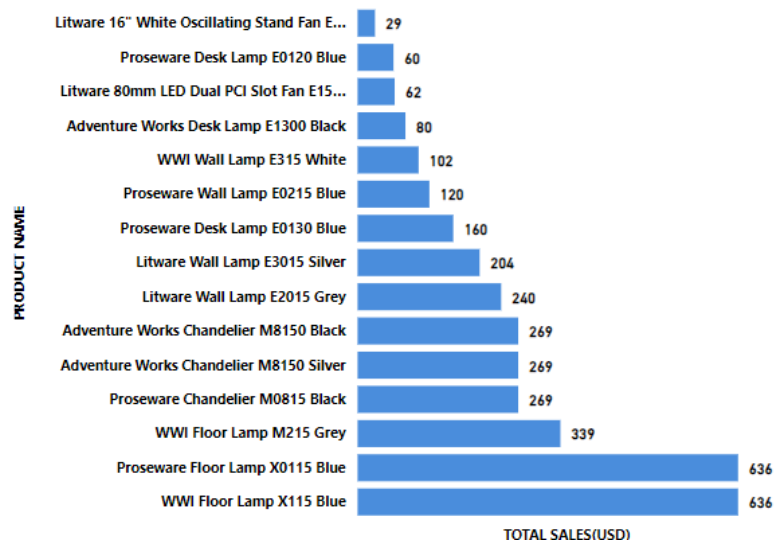## A) SALES PERFORMANCE ACROSS DIFFERENT PRODUCT CATEGORIES
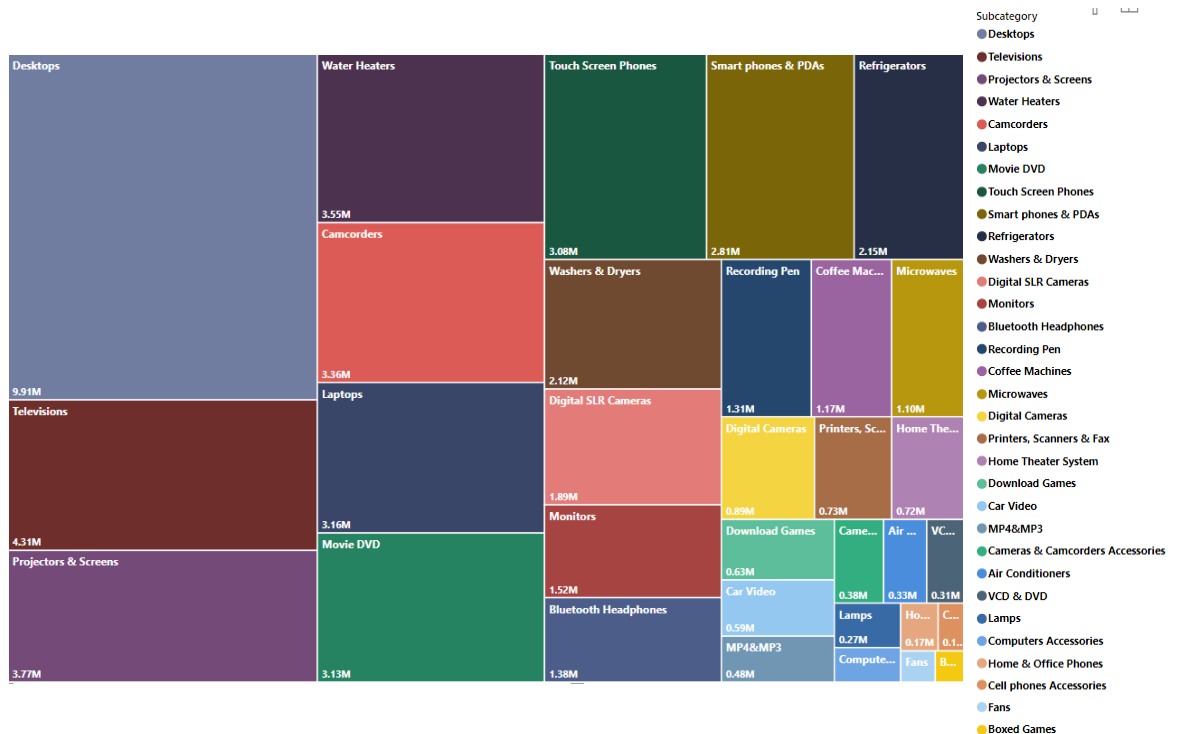

B) POPULAR PRODUCTS BASED ON SALES DATA

C) LEAST POPULAR PRODUCTS BASED ON SALES DATA

D) SALES PERFORMANCE ACROSS DIFFERENT PRODUCT SUB-CATEGORIES

KEY INSIGHTS

1. ### CUSTOMER DEMOGRAPHICS

    i. Gender is normally distributed

    ii. Age is also slightly normally distributed with people above the **age 59** being the major contributor **(44%)** to the sales

    iii. Customers from United States are the major group and from France are the minimal group

2. ### PURCHASING PATTERN

    i. There is a **upward** trend on the sales **till 2019** (2016,2017,2018) then there's a drastic **drop** in sales from **2019** to **2021**

    ii. The average amount of money spent per order by all age groups monthly over the years is around **850 USD**

    iii. On an average the purchase frequency of customers for every year is 1
    iv. The country **United states** is the major contributor to the revenue

3. ### PRODUCT PERFORMANCE

    i. Categories such as **Computers** and **Home appliances** are the major contributors to the revenue

    ii. Sub-categories such as **Desktops** are the major contributor to the revenue. Sub-categories such as **Televisions, Projectors & Screens, Water Heaters, Camcorders, Laptops, Movie DVD, Touch Screen Phones** are the second major contributor to the revenue.

    iii. Popular products in terms of quantity sold and total sales are
        a) WWI Desktop PC2.33 X2330 **(Black)**
        b) Adventure Works Desktop PC2.33 XD233 **(Silver)**
        c) Adventure Works Desktop PC2.30 MD230 (**White, Black, Silver**)
        d) Adventure Works Desktop PC1.80 ED180 (**Black, Silver, White**)
        e) Adventure Works Desktop PC1.60 ED160 (**Black, White**)
        f) WWI Desktop PC1.80 E1801 (**Black**)
        g) WWI Desktop PC1.80 E1800 (**White**)
        h) WWI Desktop PC1.60 E1600 (**Black, Silver, Red**)

4. ### STORE OPERATIONS

    i. Store in **United States** with square meters **2000** and **Online** stores are the high performing stores in terms of revenue earned
    ii. **Australia** with square meters (**2000**) has decent performance whereas **Australia** with square meters (**665,595**) is under-performing
    iii. **France** is the **least** performing stores compared to other stores also having square meters less than **500**

ACTIONABLE RECOMMENDATIONS

1. MARKETING STRATEGIES

a) To increase Frequent purchase

- Reward customers with discounts, reward points
- Create personalized offers and communications for high valued customers
- SMS and Email Marketing

b) Inventory Management

- Optimize stock levels for top-selling products especially for Stores in United states, United Kingdom

c) Store Expansion

- Expand the stores in United states and Australia with 2000 square meters

d) Increase average order value

- Bundle products that are popular
- Create Free shipping and other gifts for high valued customers