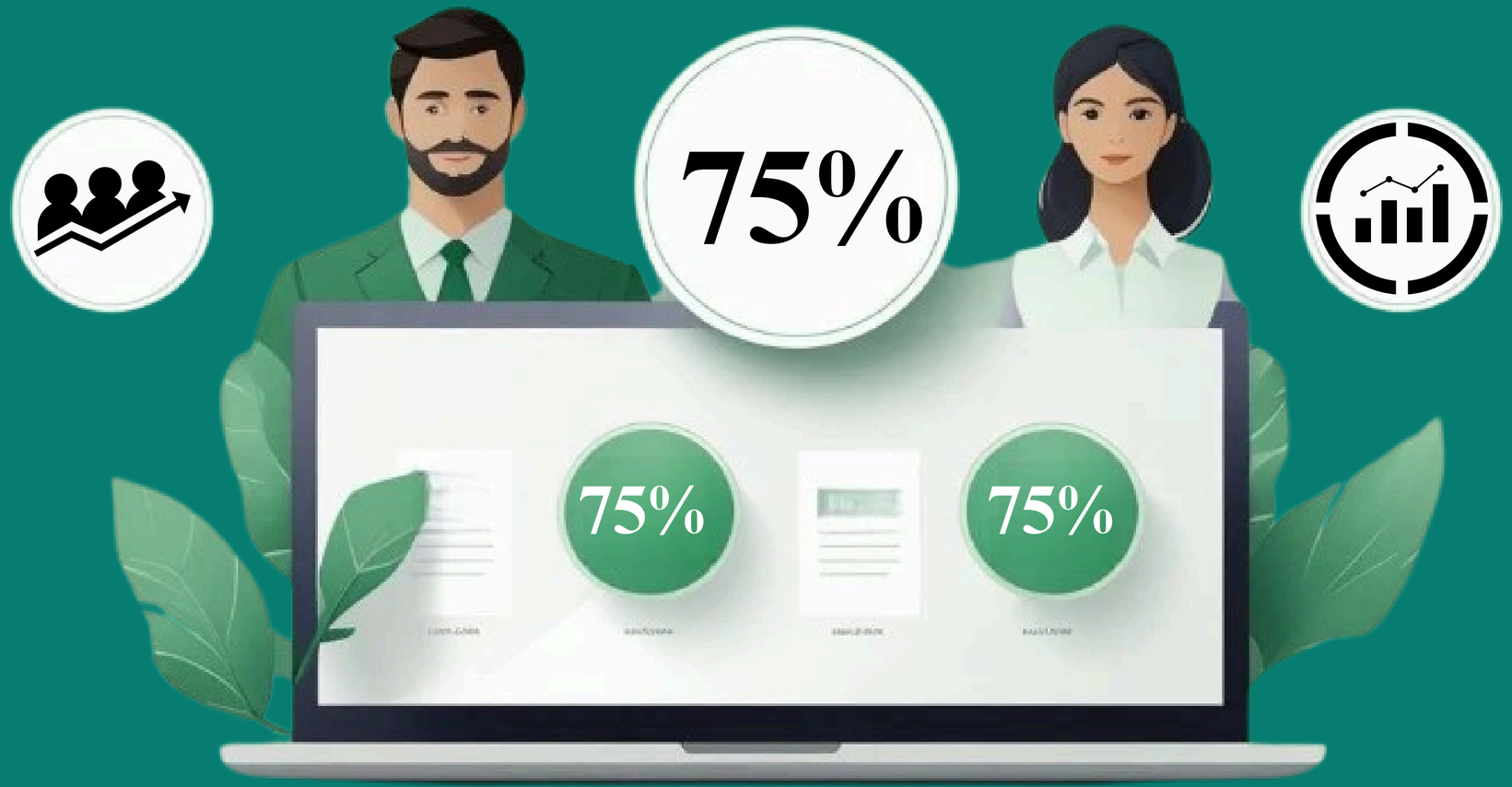
Household Income Analysis

A Data-Driven Look at Socioeconomic Patterns



Household Income Analysis

Project Overview

This project aims to analyze a household income dataset using SQL and Excel to identify the key demographic and socioeconomic factors influencing income. The insights derived can be used to inform policy decisions, financial strategies, and better understand income disparities across different population groups.

Objective

To explore how factors such as education, occupation, household size, gender, experience, and location type impact household income levels and per capita income.

Tools Used

SQL (MySQL) – Data extraction and advanced analysis
Microsoft Excel – Data cleaning, calculated columns, KPI visualization, pivot charts, dashboards

Key Performance Indicators (KPIs)

- Average Household Income ₹827,523.27
- Homeownership Status Own: ₹761,271.60 Rent: ₹925,153.39
- Gender Pay Gap Male: ₹858,274.93 Female: ₹794,932.25

Household Income Analysis

Which age group earns the highest income?

```sql
SELECT
    CASE
        WHEN Age BETWEEN 18 AND 29  THEN 'Young Adults (18-29)'
        WHEN Age BETWEEN 30 AND 39  THEN 'Young Professionals (30-39)'
        WHEN Age BETWEEN 40 AND 49  THEN 'Mid-Career Professionals(40-49)'
        WHEN Age BETWEEN 50 AND 59  THEN 'Established Adults (50-59)'
        WHEN Age BETWEEN 60 AND 70  THEN 'Seniors (60-70)'
        ELSE 'Out of Range'
    END AS Age_Group,
    COUNT(*) AS Total_People,
    ROUND(AVG(Income), 2) AS `Average_Income`
FROM `data`
WHERE `Is_Anomaly` = 'No'
GROUP BY Age_Group
ORDER BY Total_People;
```

AGE GROUP	TOTAL PEOPLE	AVERAGE INCOME
Young Adults (18-29)	344	869,992.42
Young Professionals (30-39)	539	795,128.43
Mid-Career Professionals (40)	865	808,972.87
Established Adults (50-59)	1,142	845,986.33
Seniors (60-70)	1,518	826,082.36

Household Income Analysis

Is there a gender pay gap in household income?

```sql
SELECT
    `Gender`,
    COUNT(*) AS Total_Individuals,
    ROUND(AVG(Income), 2) AS Avg_Income
FROM `data`
WHERE `Is_Anomaly` = 'No'
GROUP BY `Gender`;
```

GENDER	TOTAL INDIVIDUALS	AVG. INCOME
Male	2,268	858,274.93
Female	2,140	794,932.25

Household Income Analysis

How does education level impact income?

```sql
SELECT
    `Education_Level`,
    ROUND(AVG(income), 2) AS `Average_Income`
FROM `data`
WHERE `Is_Anomaly` = 'No'
GROUP BY `Education_Level`;
```

EDUCATION LEVEL	AVERAGE INCOME
Master's	828,098.75
High School	923,699.06
Bachelor's	792,801.06
Doctorate	551,443.78

Household Income Analysis

Do full-time employees earn significantly more than others?

```sql
SELECT
    `Employment_Status`,
    ROUND(AVG(Income), 2) AS `Average_Income`
FROM `data`
WHERE `Is_Anomaly` = 'No'
GROUP BY `Employment_Status`;
```

EMPLOYMENT STATUS	AVERAGE INCOME
Full-time	763,152.07
Self-employed	792,253.25
Part-time	961,357.07

Household Income Analysis

Are renters earning more than homeowners?

```sql
SELECT
    `Homeownership_Status`,
    ROUND(AVG(Income), 2) AS `Average_Income`
FROM `data`
WHERE `Is_Anomaly` = 'No'
GROUP BY `Homeownership_Status`;
```

HOUSEOWNERSHIP STATUS	AVERAGE INCOME
Own	761,271.60
Rent	925,153.39

Household Income Analysis

Which occupations are the most lucrative?

```sql
SELECT Occupation, ROUND(AVG(Income), 2) AS `Average_Income`
FROM `data`
WHERE `Is_Anomaly` = 'No'
GROUP BY `Occupation`
ORDER BY AVG(Income) DESC;
```

OCCUPATION	AVERAGE INCOME
Education	958,681.72
Technology	898,227.04
Others	866,985.15
Healthcare	751,350.14
Finance	699,961.38

Household Income Analysis

What is the income distribution across different household sizes?

```sql
SELECT
    `Household_Size`,
    COUNT(*) AS Total_Households,
    ROUND(AVG(Income), 2) AS `Average_Income`
FROM `data`
WHERE `Is_Anomaly` = 'No'
GROUP BY `Household_Size`
ORDER BY `Household_Size`;
```

HOUSEHOLD SIZE	TOTAL HOUSEHOLDS	AVERAGE INCOME
1	275	713,990.65
2	398	840,764.71
3	568	856,589.41
4	660	866,615.69
5	817	870,096.29
6	825	762,622.21
7	865	830,300.16

Household Income Analysis

How does income vary across Urban, Suburban, and Rural households?

```sql
SELECT
    `Location`,
    COUNT(*) AS Total_Individuals,
    ROUND(AVG(Income), 2) AS `Average_Income`
FROM `data`
WHERE `Is_Anomaly` = 'No'
GROUP BY `Location`;
```

LOCATION	TOTAL INDIVIDUALS	AVERAGE INCOME
Urban	3,083	784,874.92
Rural	463	966,733.18
Suburban	862	905,285.07

Household Income Analysis

Does income increase with years of work experience?

```sql
SELECT
    CASE
        WHEN Work_Experience BETWEEN 0 AND 5  THEN '0-5 yrs'
        WHEN Work_Experience BETWEEN 6 AND 10  THEN '6-10 yrs'
        WHEN Work_Experience BETWEEN 11 AND 15  THEN '11-15 yrs'
        WHEN Work_Experience > 15 THEN '16 + yrs'
        ELSE 'Unknown'
    END AS Experience_Group,
    COUNT(*) AS Total_Individuals,
    ROUND(AVG(Income), 2) AS `Average_Income`
FROM `data`
WHERE `Is_Anomaly` = 'No'
GROUP BY Experience_Group
ORDER BY Experience_Group;
```

EXPERIENCE GROUP	TOTAL INDIVIDUALS	AVERAGE INCOME
0-5 yrs	881	735,300.09
6-10 yrs	668	955,892.33
11-15 yrs	580	857,212.61
16+ yrs	2,279	817,992.01

Household Income Analysis

What is the per capita income across different household sizes?

```sql
SELECT
    `Household_Size`,
    COUNT(*) AS Total_Households,
    ROUND(AVG(Income / Household_Size),2) AS Avg_Per_Capita_Income
FROM `data`
WHERE `Is_Anomaly` = 'No'
GROUP BY `Household_Size`
ORDER BY `Household_Size`;
```

HOUSEHOLD SIZE	TOTAL HOUSEHOLDS	AVG. PER CAPITA INCOME
1	275	713,990.65
2	398	420,382.36
3	568	285,529.80
4	660	216,653.92
5	817	174,019.26
6	825	127,103.70
7	865	118,614.31

Household Income Analysis

◆ Anomaly Detection (Flagged Rows)

As part of the data quality check and preprocessing step, we identified anomalies in the dataset — rows that had unrealistic or out-of-range values, which could distort the analysis. These anomalies were flagged for review or exclusion.

◆ **Key Insights**

- Households that rent have higher average income than those who own.
- Education and Technology occupations yield the highest incomes.
- Income rises steadily with age and peaks in the 46–60 age group.
- There is a noticeable gender pay gap of ₹63,342.
- Urban households earn more than rural or suburban ones.
- Per capita income decreases with increasing household size.

◆ **Conclusion**

The analysis reveals significant disparities in income based on education, occupation, location, and household dynamics. These findings highlight the importance of targeted socioeconomic policies and individual planning strategies. Excel dashboards offer interactive and accessible ways to present these insights visually.