



Midterm Skills Examination

# CENSUS .

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- BSCPE22S3



# Census Income

Donated on 4/30/1996

Predict whether income exceeds \$50K/yr based on census data. Also known as Adult dataset.

## Dataset Characteristics

Multivariate

## Feature Type

Categorical, Integer

## Subject Area

Social Science

## # Instances

48842

## Associated Tasks

Classification

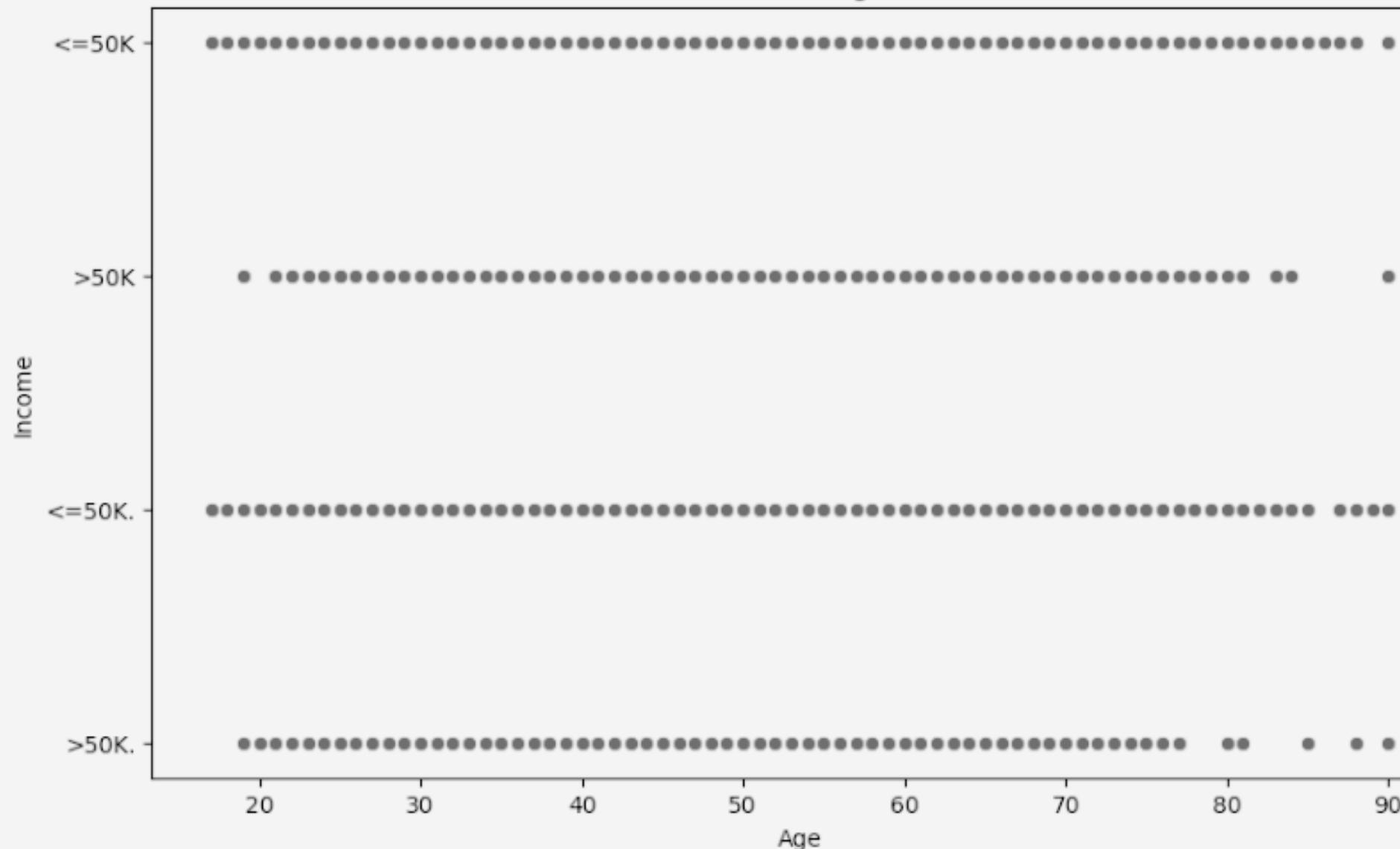
## # Features

14

# Census Income

Kohavi, Ron. (1996). Census Income. UCI Machine Learning Repository. <https://doi.org/10.24432/C5GP7S>.

Correlation between Age and Income



# Age and Income Analysis:

Based on the graph, it appears that individuals ranging from late teens to mid-80s typically earn less than \$50,000 annually. Additionally, the graph suggests a consistent workforce participation among older age groups. Notably, there is a significant decline in earnings after the age of 70, indicating a trend likely associated with retirement.



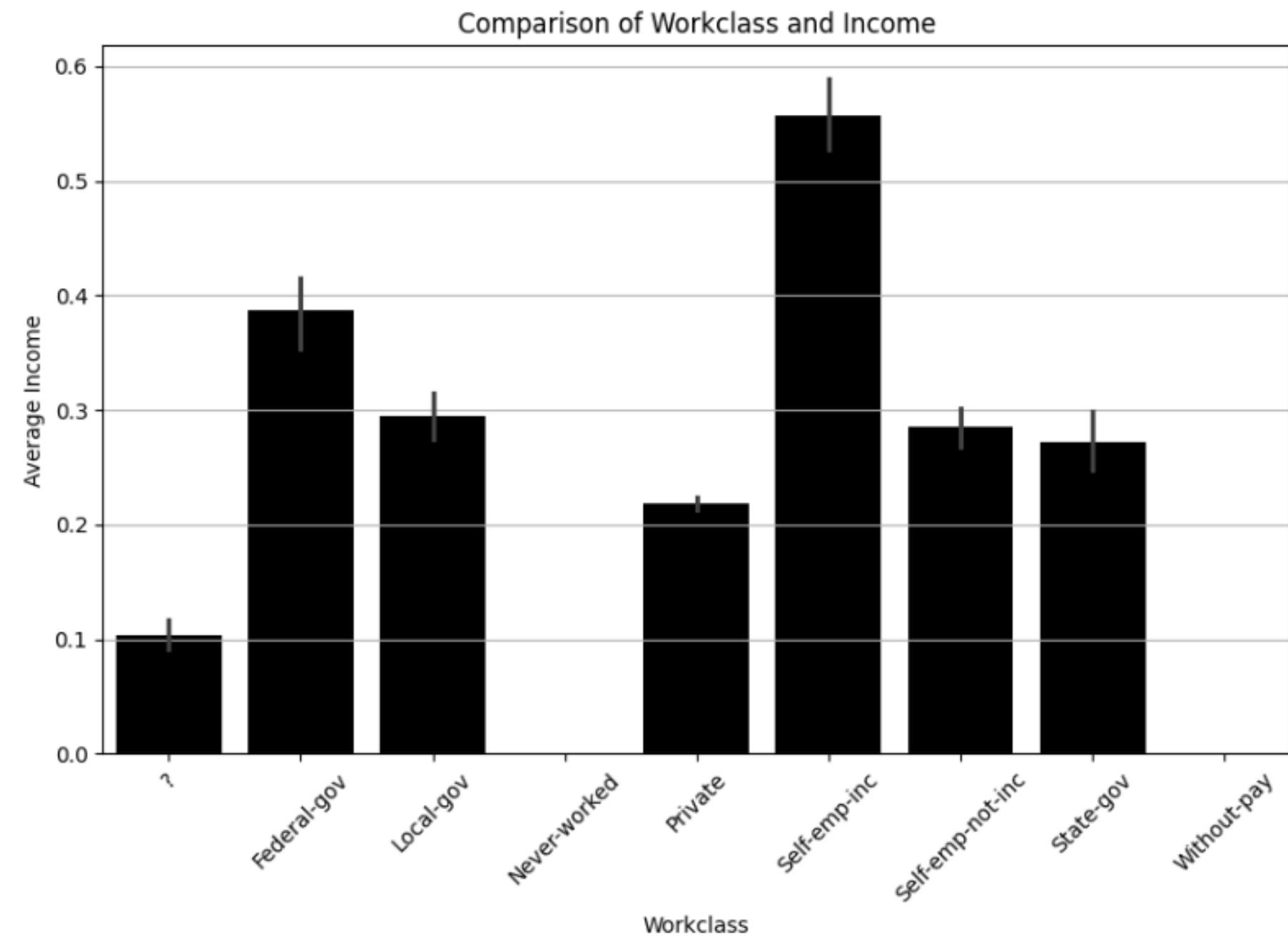
## Description

This comparison explores how age correlates with income levels. It can reveal whether there is a trend of increasing or decreasing income with age, which is important for understanding age-related income dynamics, workforce participation, and retirement planning.

# Workclass vs. Income:

The graph clearly illustrates a significant income disparity between the self-employed, including entrepreneurs, and other working classes, with a distinct margin above 0.5. This margin is further highlighted by a 0.1 difference, suggesting a substantial gap in earnings. Following the self-employed category, Federal Government income ranks next, trailed by Local Government earnings.

Between work-class categories and income levels. It helps to understand how different types of employment, such as private sector, government, or self-employment, influence income.

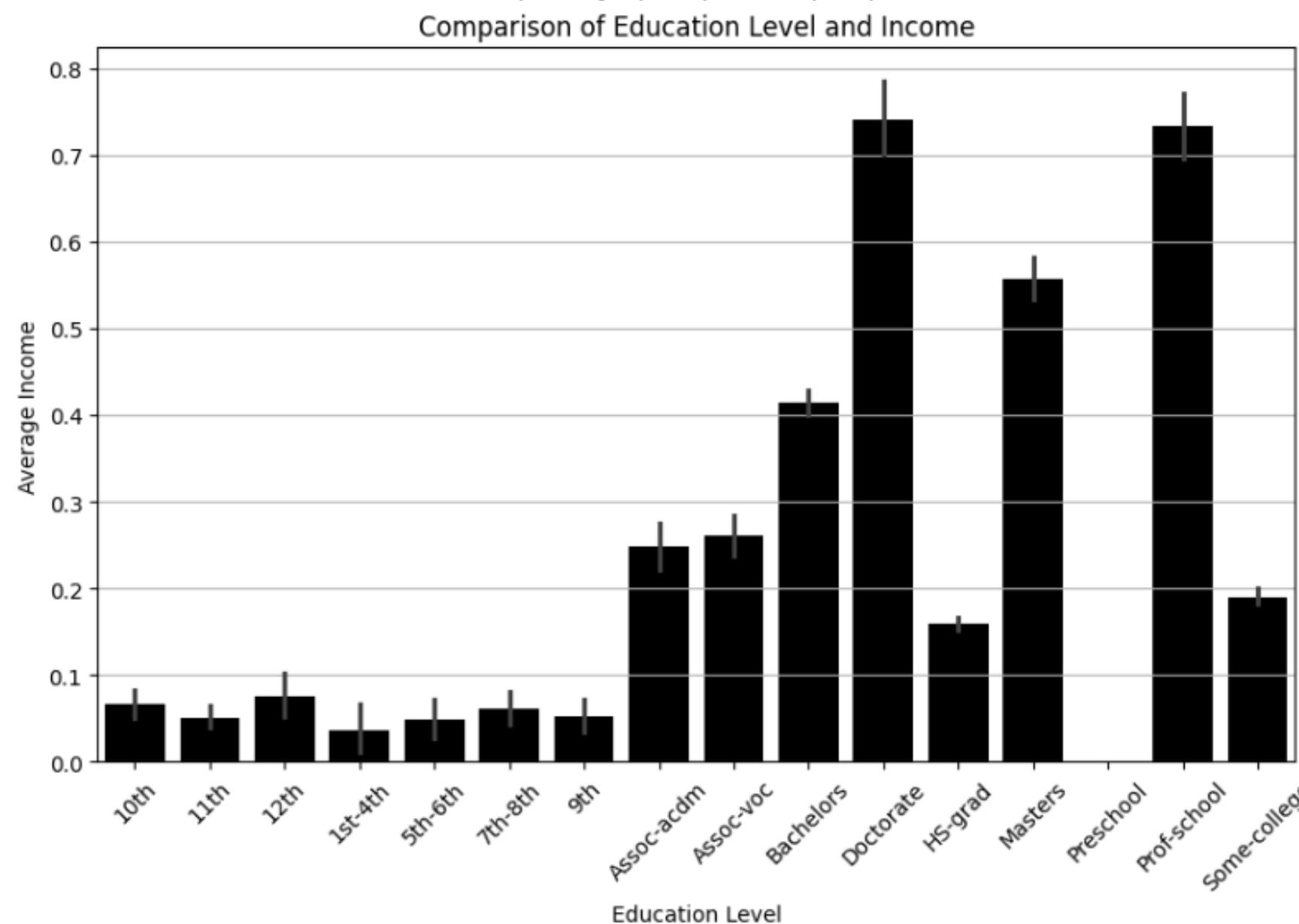




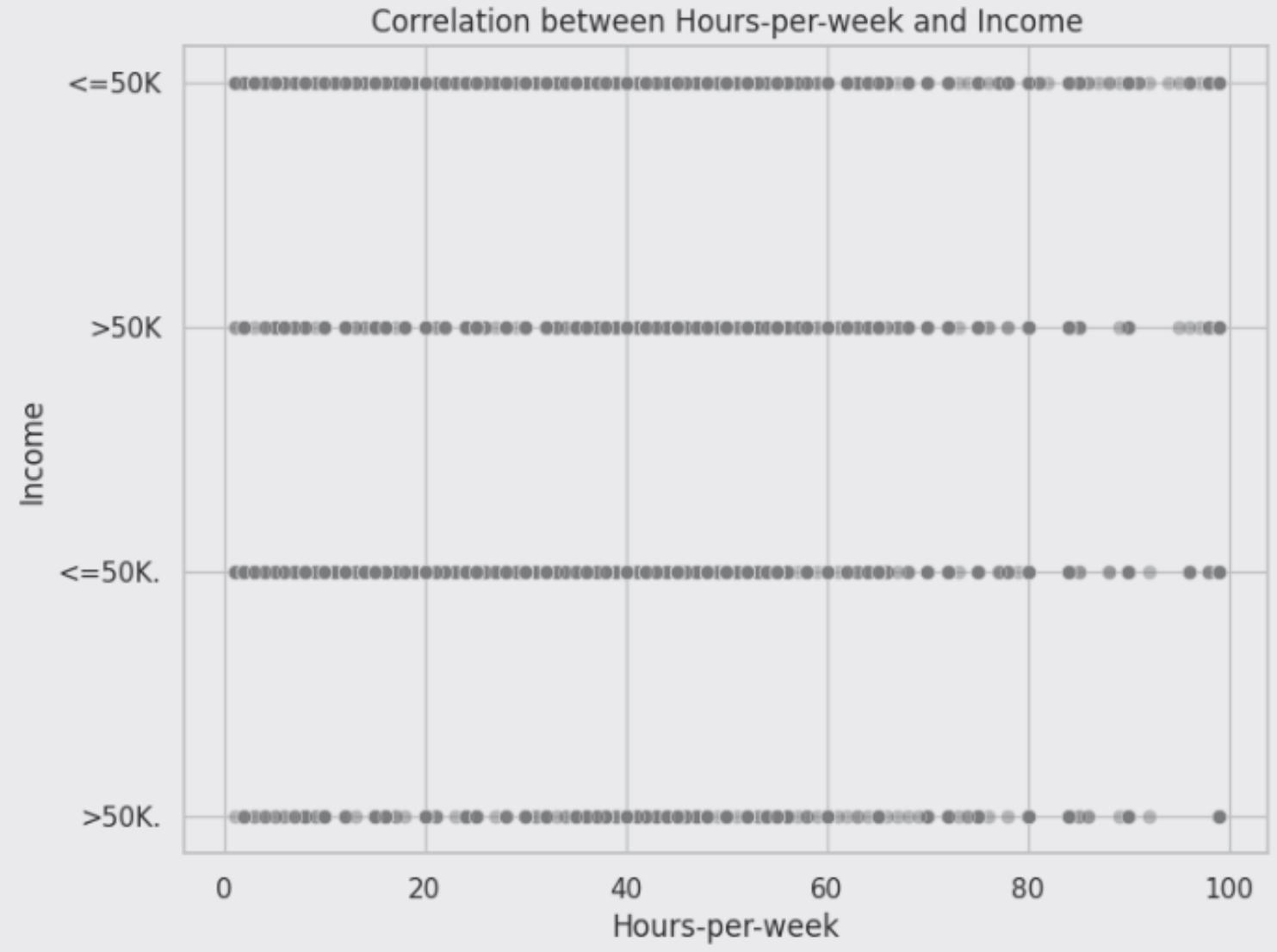
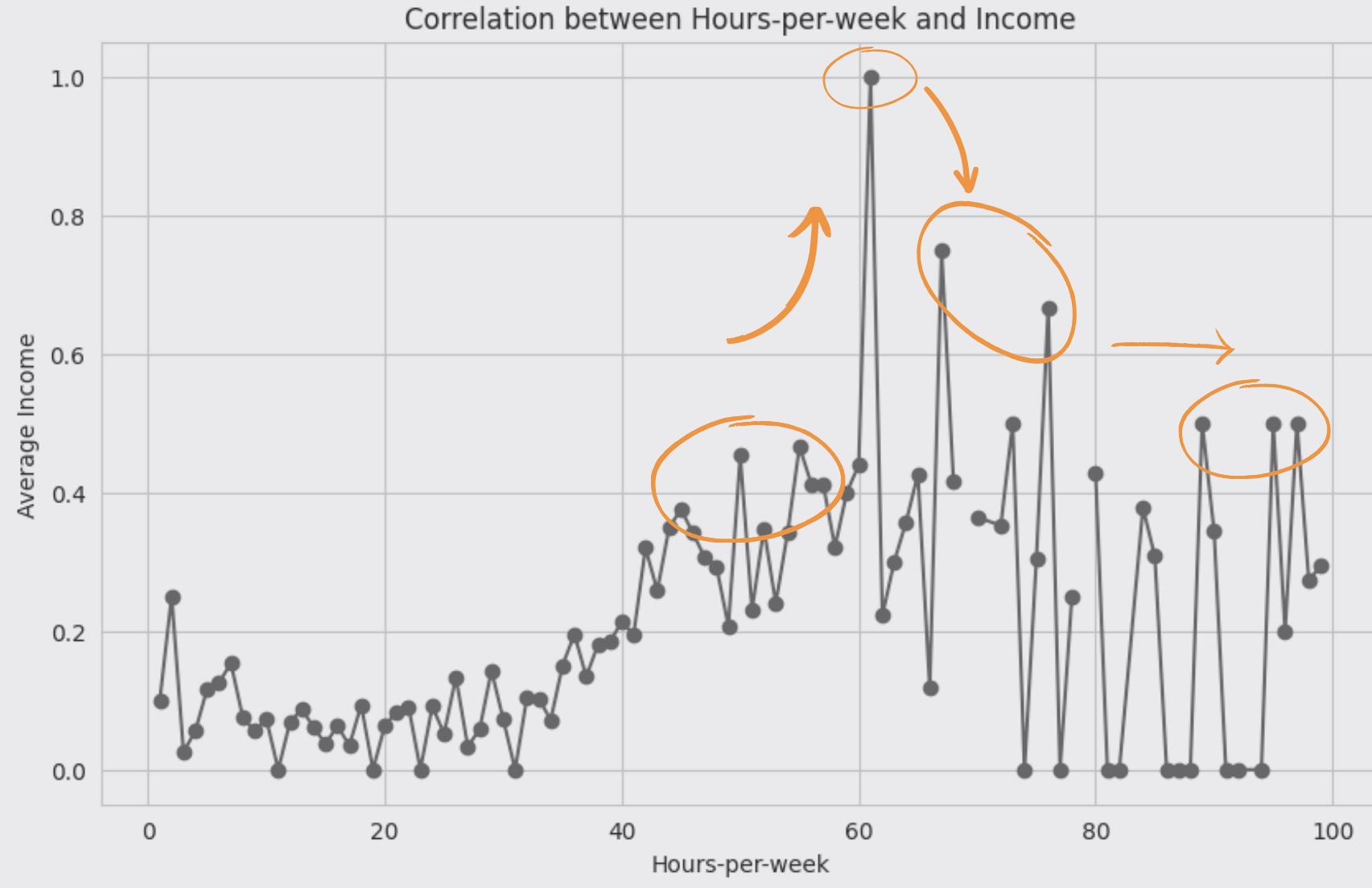
## Description

This analysis examines if higher education relates to higher income, impacting policy, careers, and socioeconomic mobility.

# Education Impact on Income:



The graph demonstrates a strong correlation between higher education levels and higher salaries, with individuals holding doctorate degrees earning above a 0.7 rating, followed by those with master's degrees, and then other educational attainments. This relationship underscores how advanced degrees typically equip individuals with specialized skills and qualifications that lead to higher-paying job opportunities.



# Income level per work hours

The graph illustrates a gradual increase in income rating from 20 to 40 hours per week, followed by a notable rise with consistent income ratings from 40 to 60 hours. Surprisingly, there's a sharp increase of 0.2 to 0.3 in income rating around the 60 to 80-hour mark. However, individuals working even longer hours than 80 show lower income ratings, though still consistently higher than those working 20 to 60 hours per week.

Description

Examines how the number of hours worked per week correlates with income levels. It helps to understand whether working longer hours is associated with higher income and provides insights into labor market dynamics and wage structures.

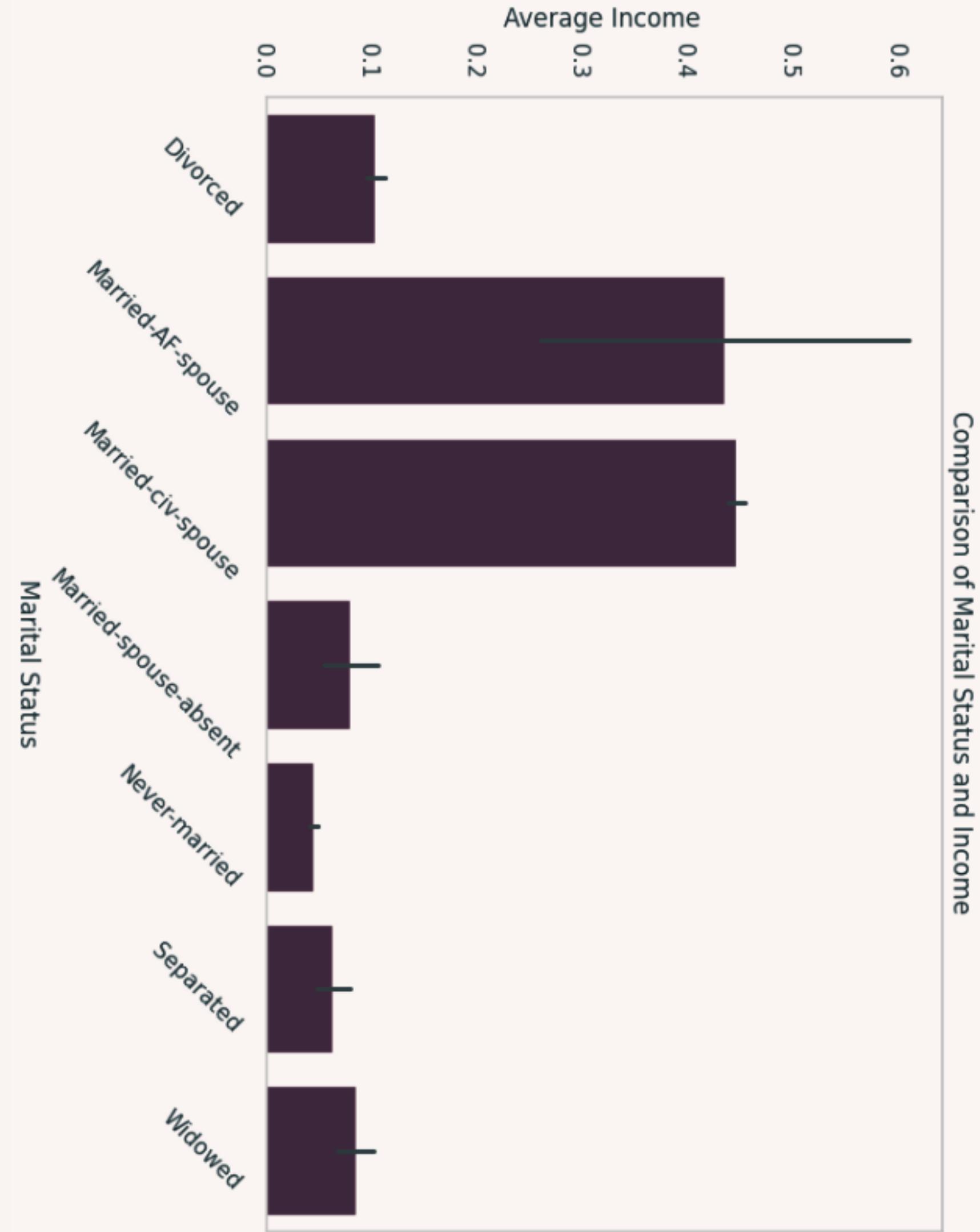
# Income per marital status

Based on the graph, it appears that married individuals, particularly those married to either a **civilian** or a member of the **Armed Forces (AF)**, tend to have higher incomes compared to unmarried individuals. However, the graph also suggests that separated married couples experience a significant decline in income, potentially indicating financial strain or instability associated with marital separation.

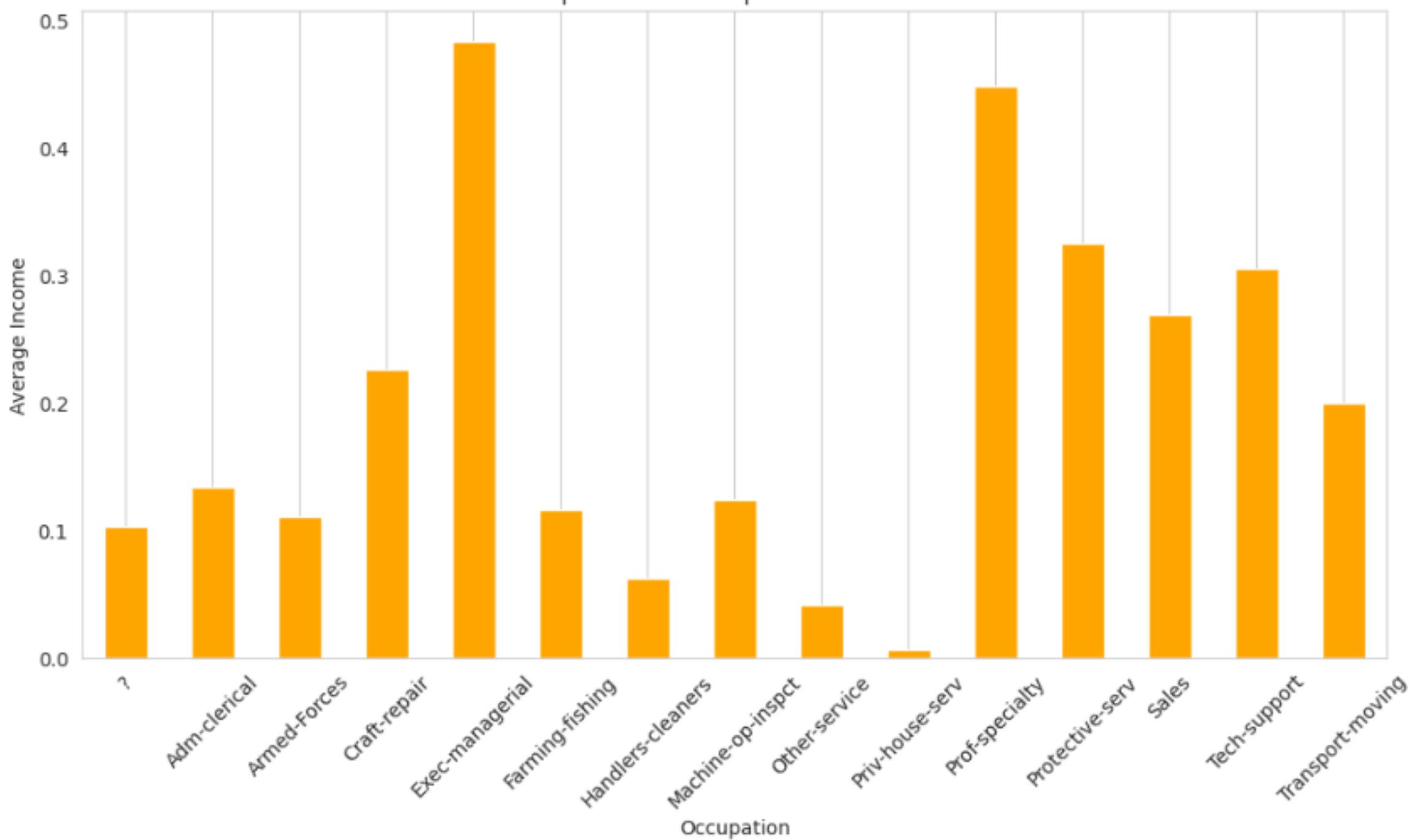


## Description

This comparison explores how marital status correlates with income levels. It can shed light on whether married individuals tend to have higher incomes compared to unmarried individuals, and it may highlight potential socioeconomic factors influencing income disparities between marital statuses.



# Comparison of Occupation and Income



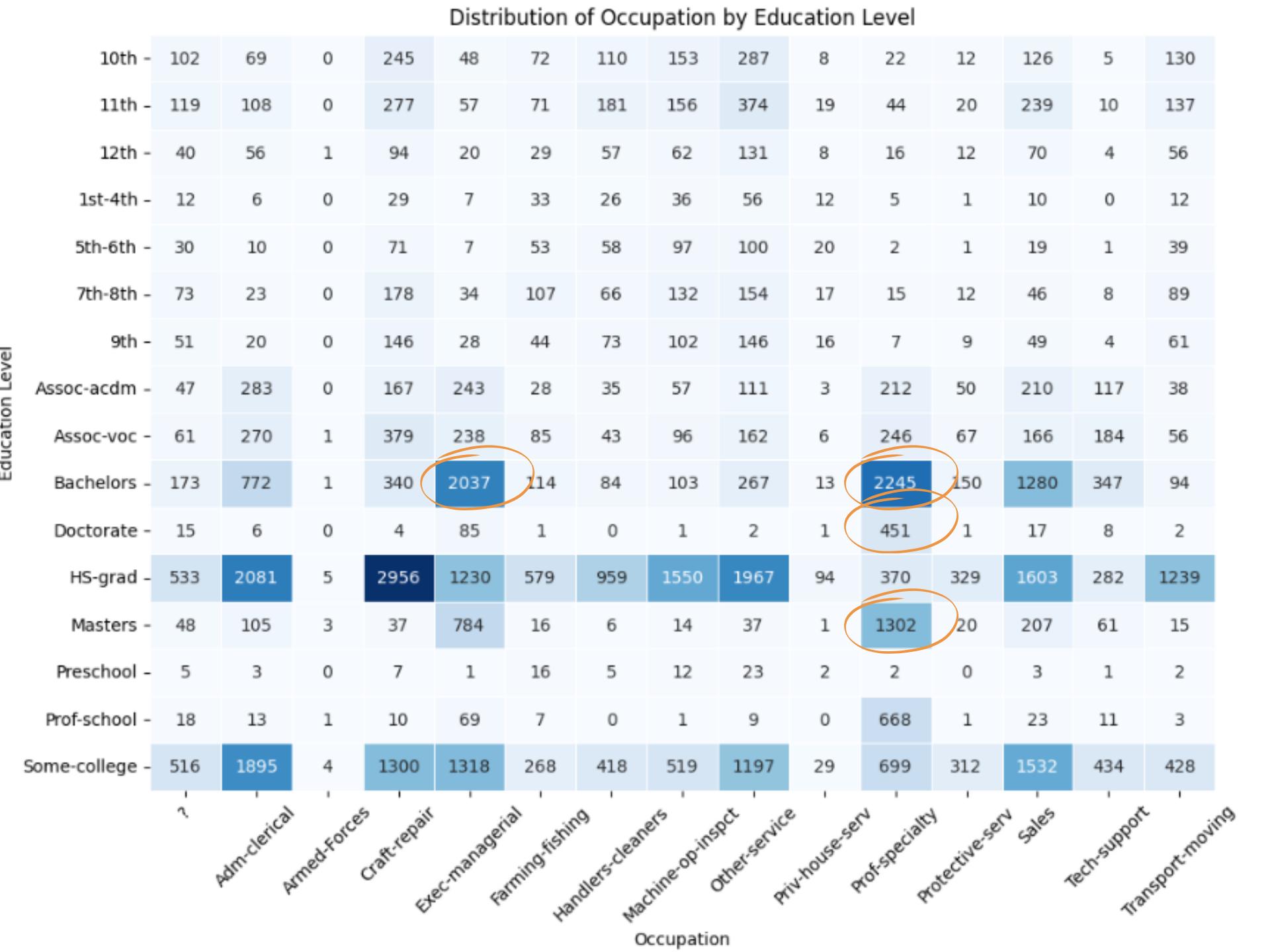
## Description

This comparison examines the income disparities across various occupations. It helps to identify occupations that typically offer higher salaries and those that may have lower income levels. Understanding these income differences can inform career choices, workforce development strategies, and policies aimed at reducing income inequality.

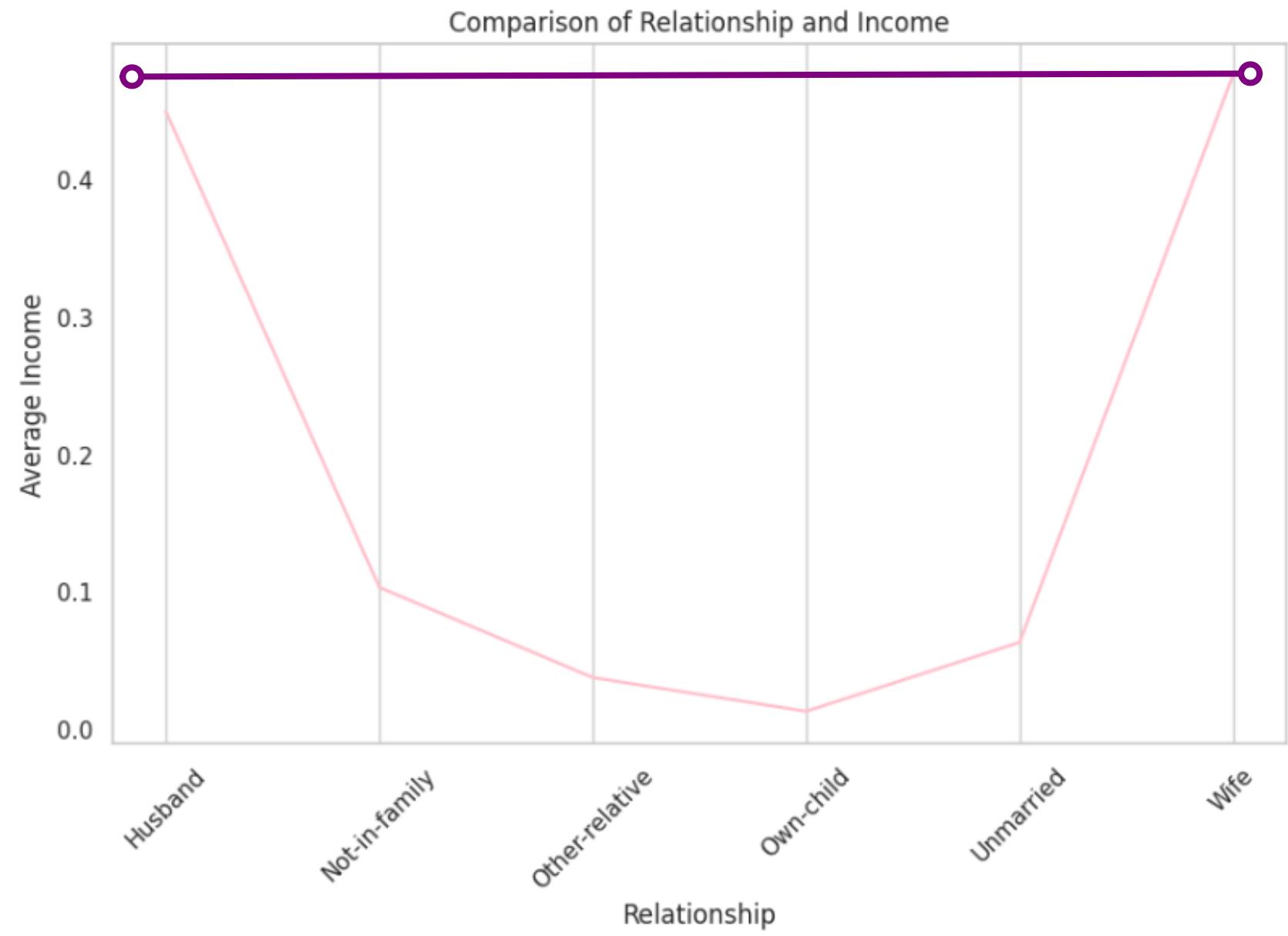
The graph reveals that individuals in executive, managerial and professional-specialty occupations have the highest salaries, followed by those in protective service, sales, tech-support, and transportation and moving occupations. This suggests that the choice of occupation is closely linked to educational attainment and significantly impacts individuals' salaries. Higher levels of education often lead to access to higher-paying professions, contributing to variations in income across different occupational categories.

# Distribution of Occupation by education level

By analyzing the heatmap, it becomes evident that individuals in executive managerial and professional specialty occupations have the highest incomes, consistent with the previous slide where individuals with bachelor's, master's, and doctorate degrees predominantly occupied these roles. This observation suggests a direct correlation between education level and income, implying that higher levels of education often lead to higher incomes in these particular professions.

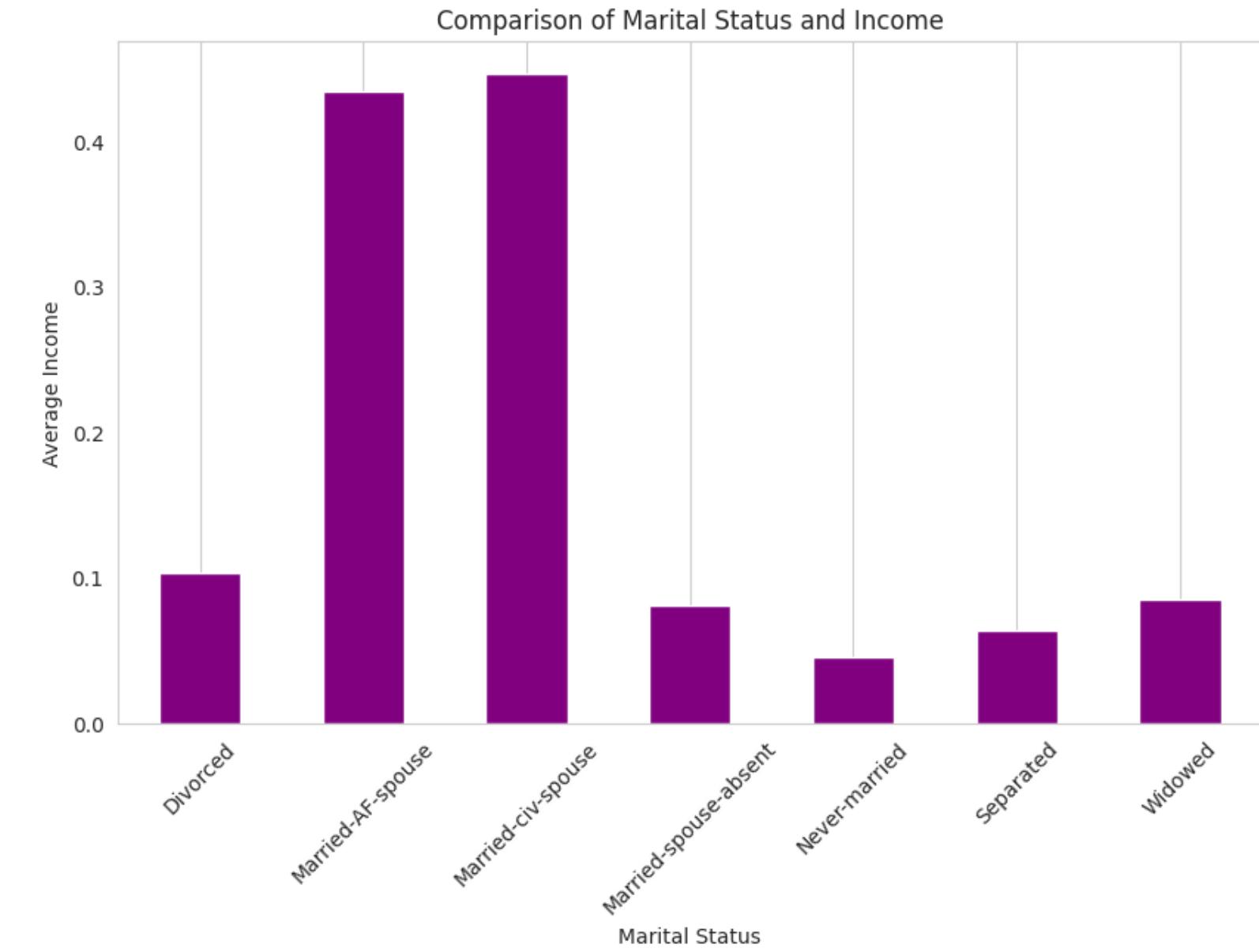


**Description**   
The heatmap provides insights into the relationship between educational attainment and occupational choices, highlighting how education influences career paths and job opportunities.



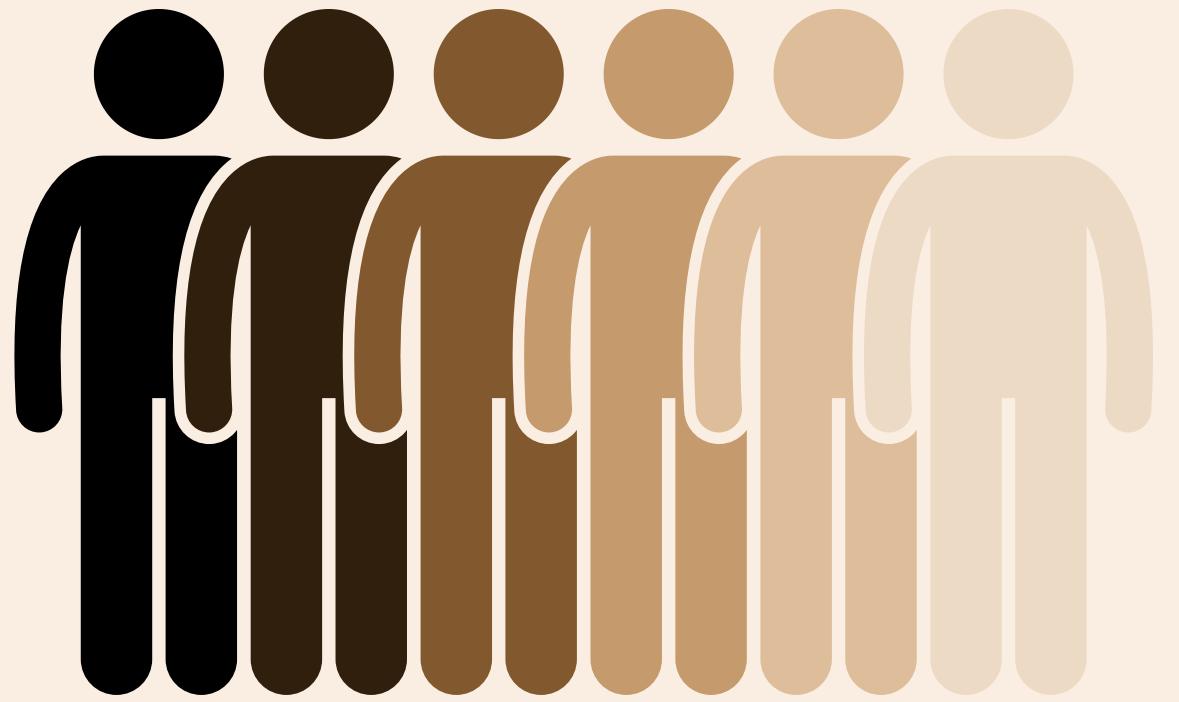
# Relationship and Income

This closer examination of the previous graph comparing marital status and income reveals that both husbands and wives individually earn decent salaries. However, when their incomes are combined, it's evident that married couples tend to have higher total household incomes compared to individuals who are single. This suggests that the combined income of married partners often exceeds the income of single individuals.



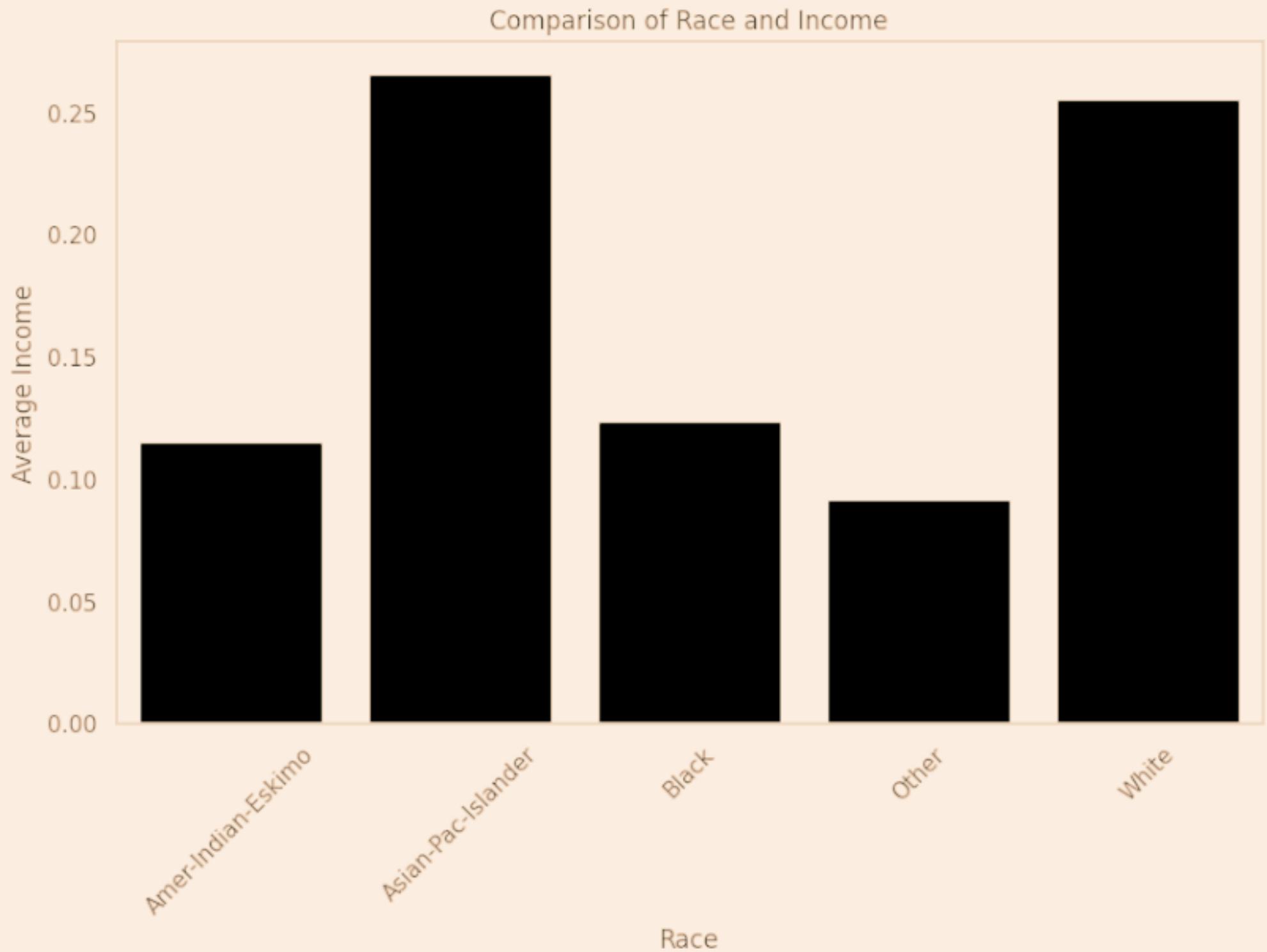
## Description

This comparison examines the correlation between relationship status and income levels. It helps to understand whether factors such as being married, single, or in other relationship statuses impact income, providing insights into household dynamics and financial well-being.



## EQ Description

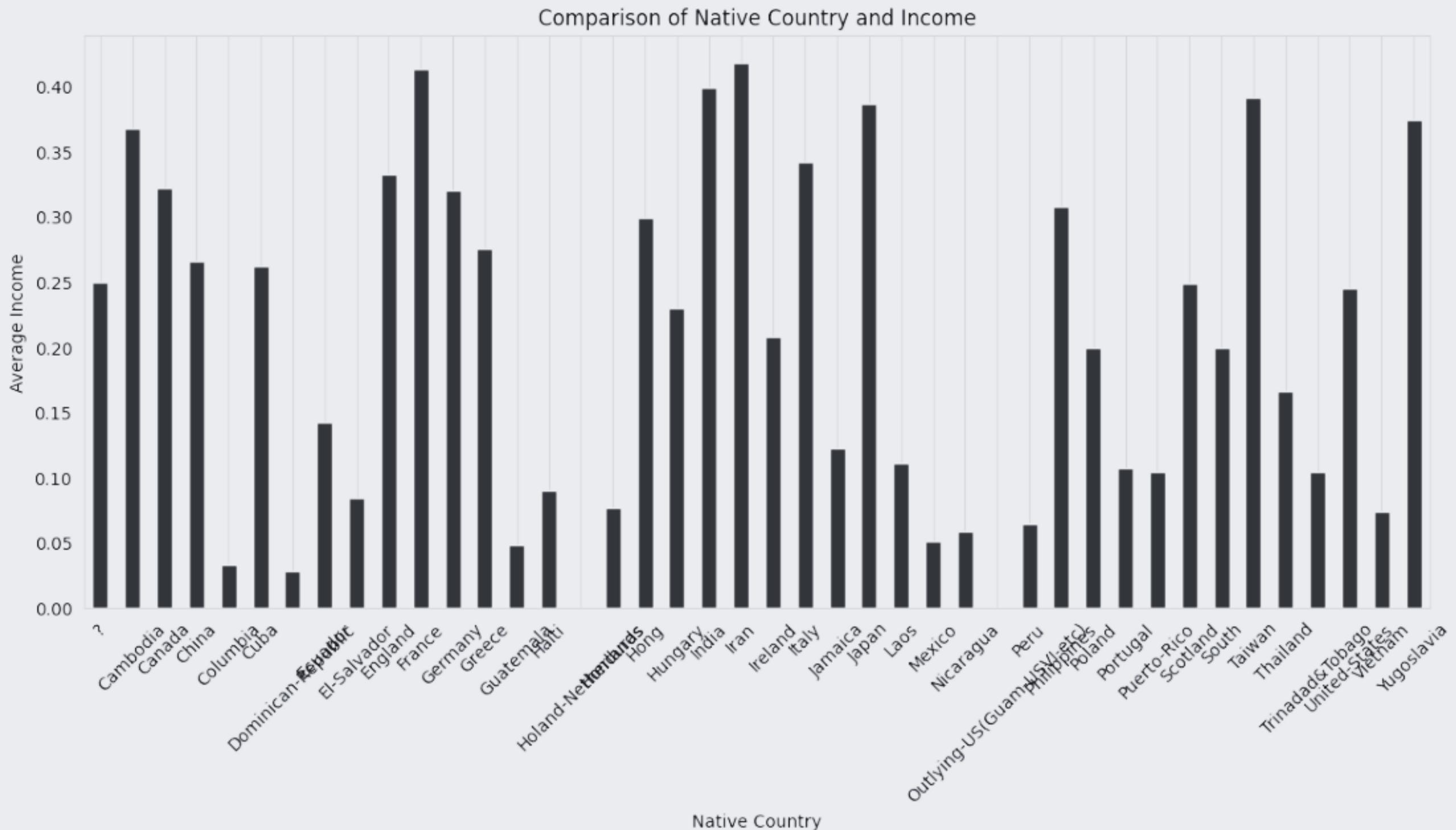
Income disparities across different racial groups. It helps to identify whether certain racial demographics tend to have higher or lower incomes, highlighting potential disparities and informing efforts to promote equity and inclusion.

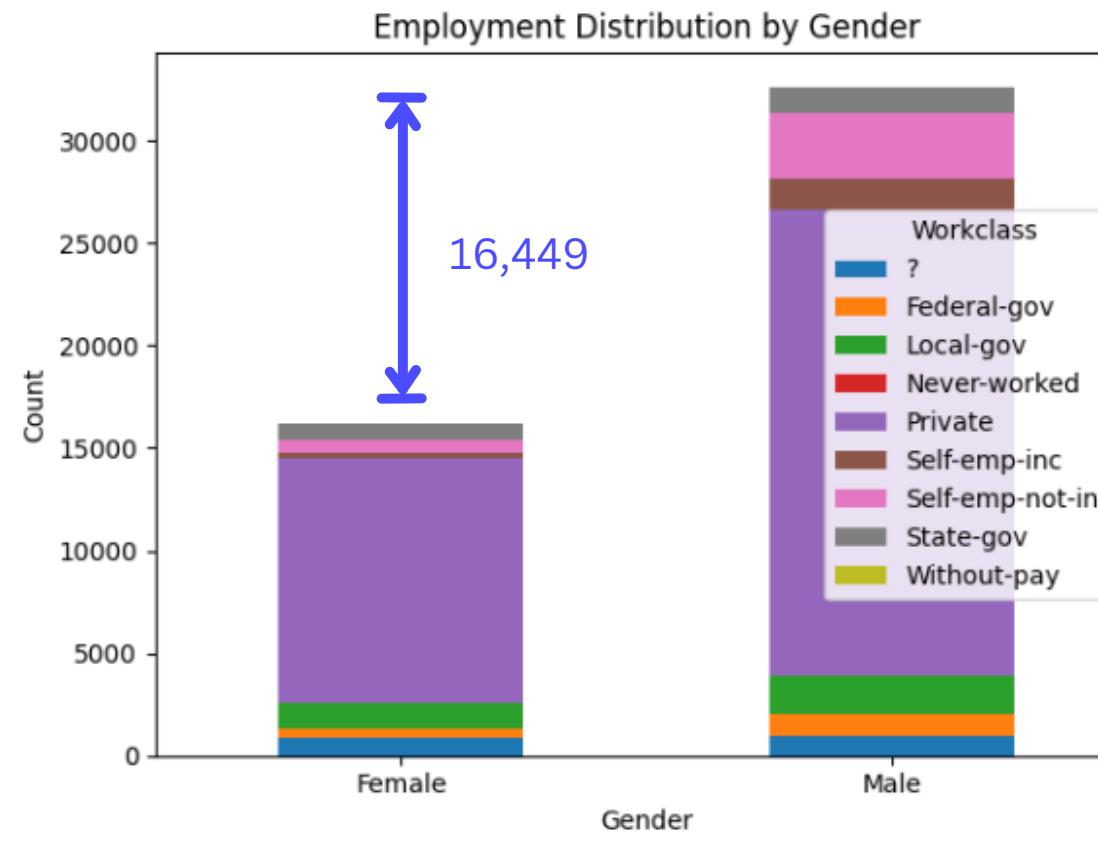
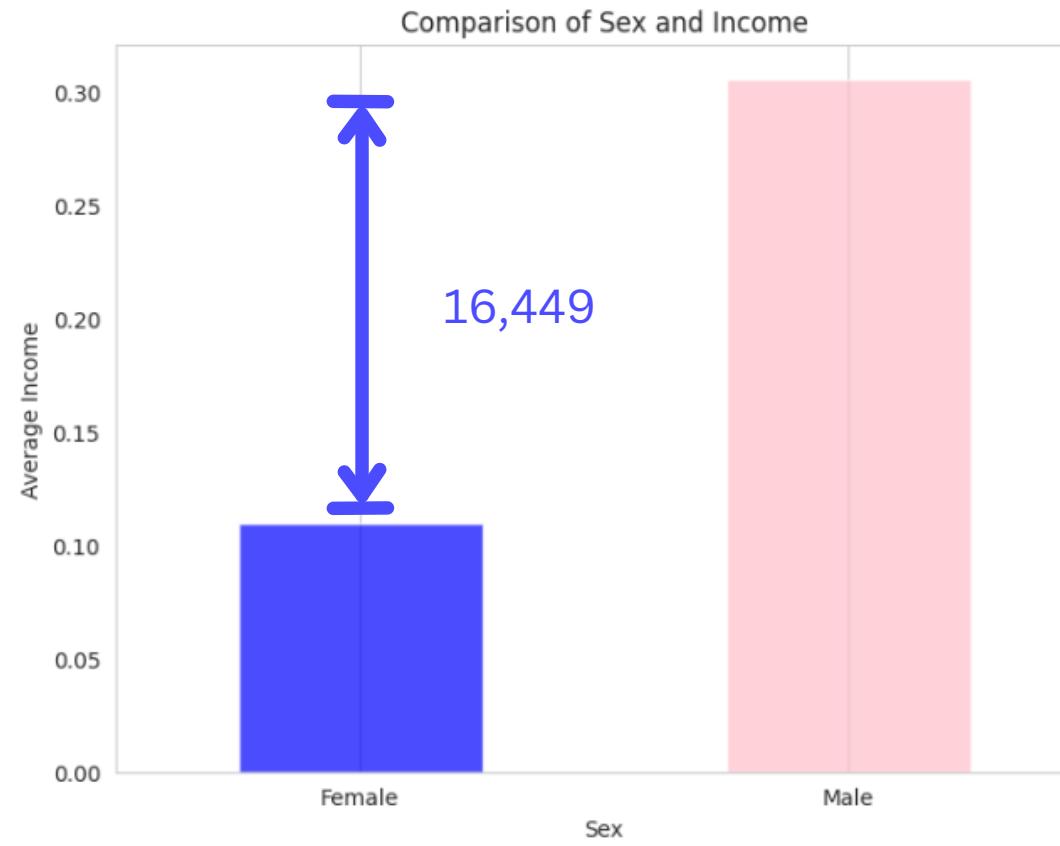




## Description

This comparison examines income disparities across different native countries. It helps to identify whether individuals from certain countries tend to have higher or lower incomes, highlighting potential socioeconomic factors influencing income levels.





```
1 total_employment = gender_workclass_pivot.sum(axis=1)
2
3 print("Total Employment Count for Each Gender:")
4 print(total_employment)
5
```

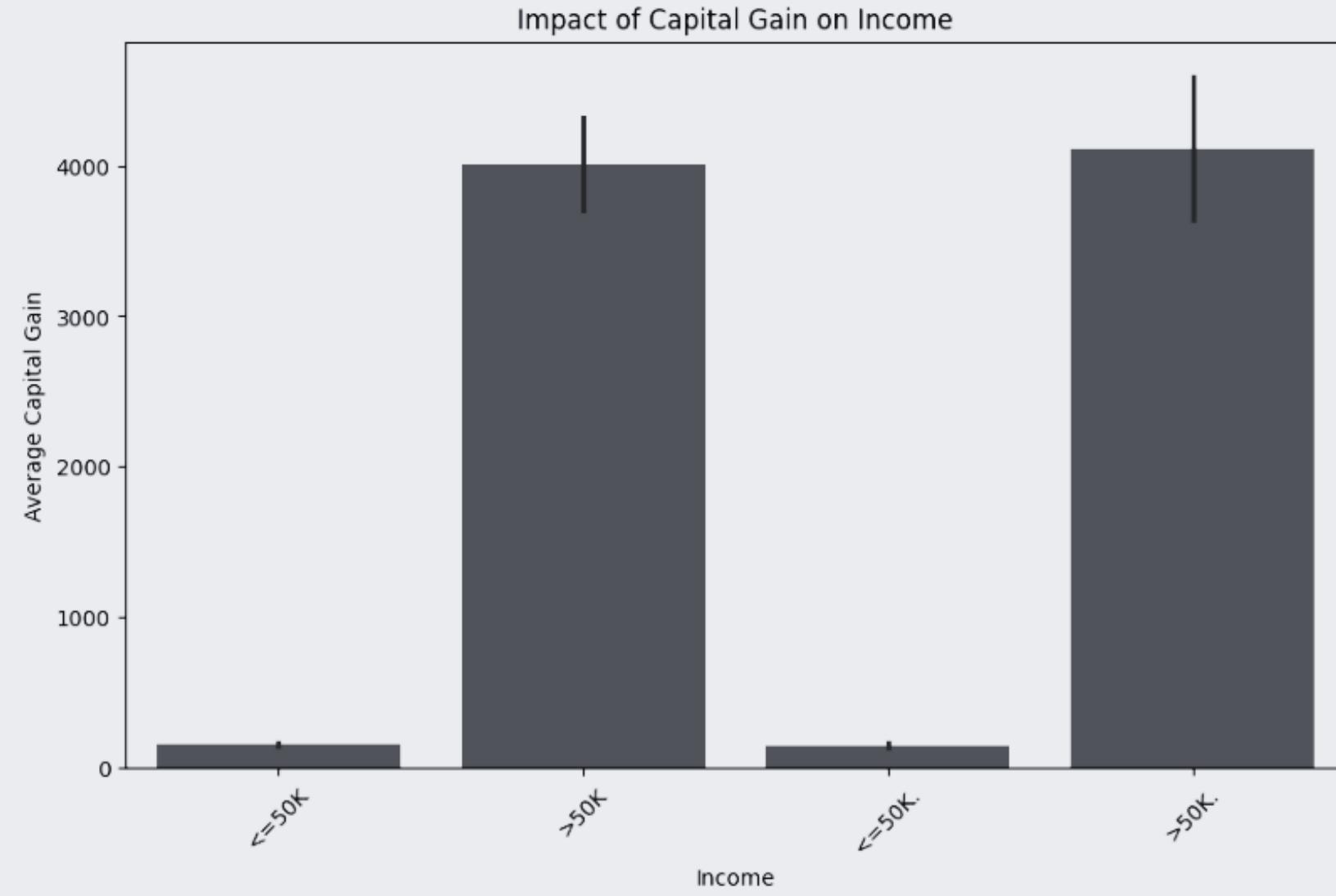
Total Employment Count for Each Gender:

sex	total_employment
Female	16182
Male	32631

dtype: int64

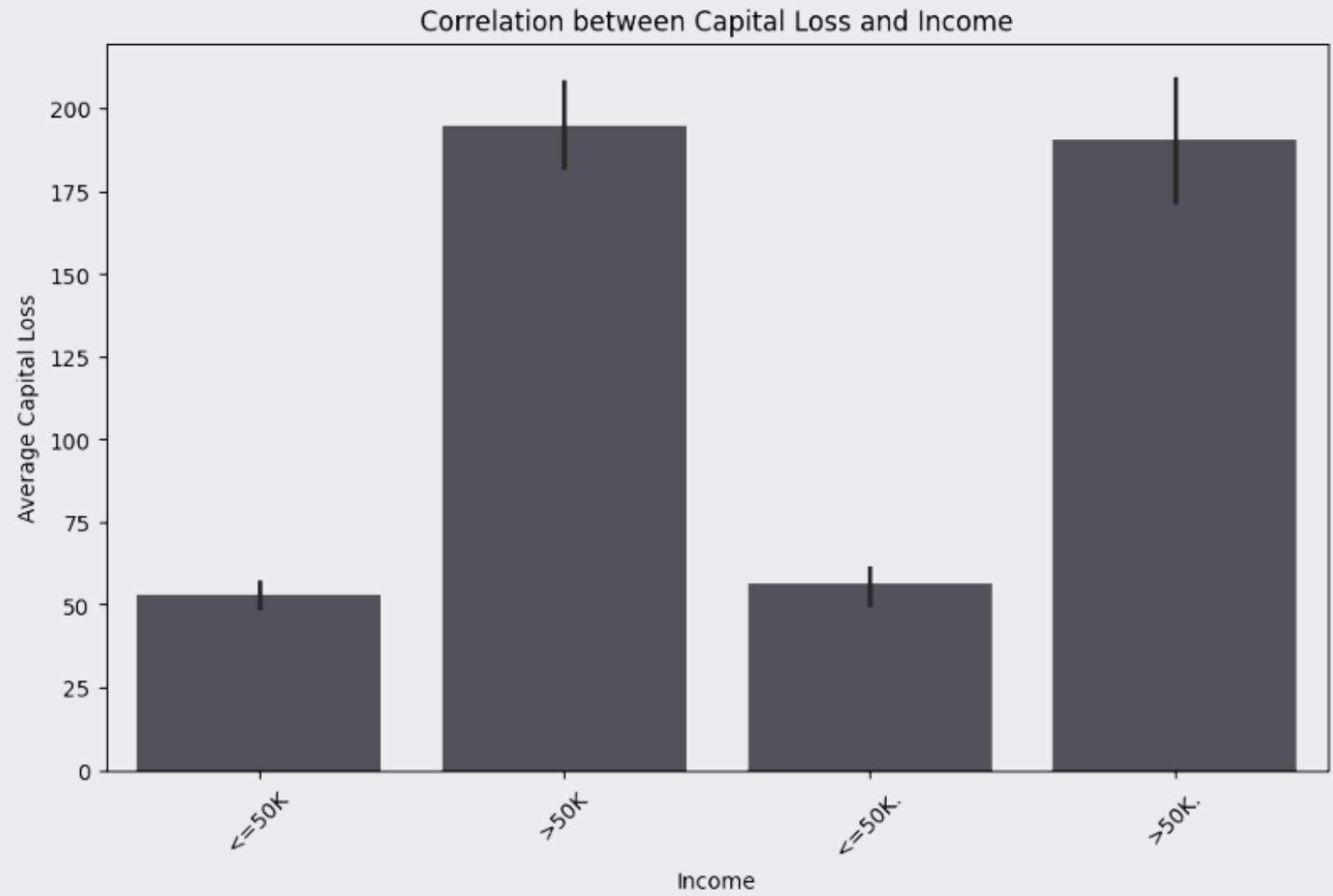
# Gender Disparities in Employment and Income Across Occupations

This comparison examines the total employment count for each gender, revealing 16,182 females and 32,631 males. With a total difference of 16,449, it sheds light on potential income disparities between genders, offering insights into the presence of a gender wage gap and the influence of gender identity on income levels. This data contributes to discussions on gender equality and workplace diversity by highlighting the significant difference in employment numbers between males and females.



## Impact of Capital Gain on Income:

capital losses correlate with income levels. It helps to understand the impact of investment losses on overall income and financial stability, providing insights into risk management and investment decision-making.



## Correlation between Capital Loss and Income:

The relationship between capital gains and income levels. It helps to understand how investment income impacts overall income levels and wealth accumulation, providing insights into investment strategies and financial planning.



## DATA ANALYSIS SUMMARY

The following Data set "**Census Income**" encompasses various aspects of demographic and income data analysis. Initial observations reveal trends such as the correlation between education level and income, differences in income based on marital status, disparities in income across occupations, and variations in employment counts between genders. For instance, higher education levels generally correspond to higher incomes, while married individuals tend to have higher combined household incomes compared to singles. Additionally, certain occupations, such as executive managerial and professional specialties, command higher salaries, and there are notable differences in employment counts between males and females.

# CONCLUSION

Analyzing demographic and income data provides valuable insights into socioeconomic trends and disparities. The data suggest that education plays a significant role in determining income levels, with higher educational attainment generally leading to higher salaries. Furthermore, marital status appears to influence income, with married couples often enjoying higher combined incomes compared to single individuals. Occupation also plays a crucial role, as certain professions command higher salaries than others. Additionally, disparities between genders in terms of employment counts highlight ongoing discussions surrounding gender equality and workplace diversity. Overall, this analysis underscores the importance of addressing socioeconomic inequalities and promoting equal opportunities for all individuals in the workforce.



# THANK YOU

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