AUSTO MOTOR COMPANY PROJECT REPORT

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AUSTO AUTOMOBILES

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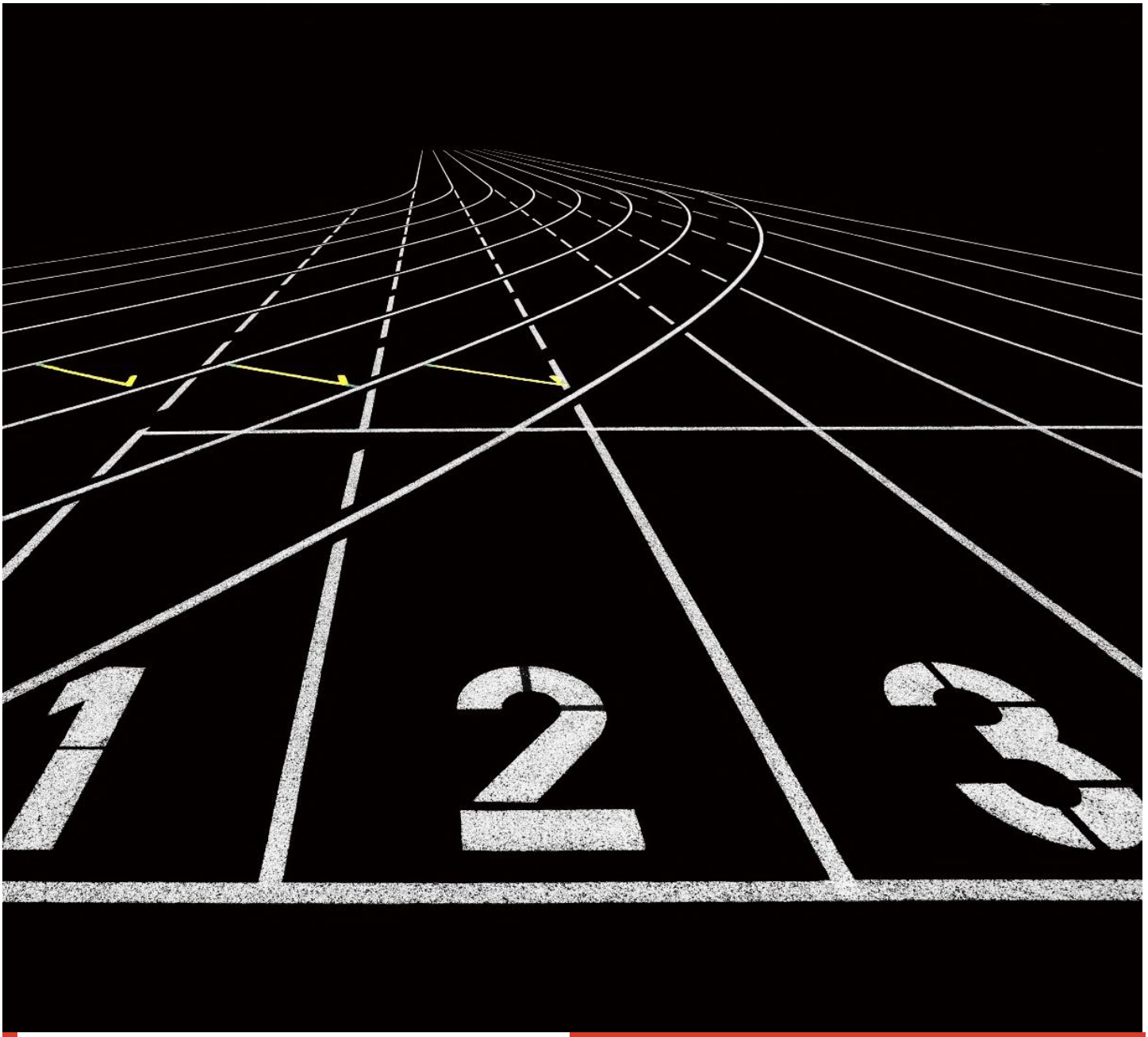


1.OBJECTIVE

Austo Motor Company is a leading car manufacturer specializing in SUV, Sedan, and Hatchback models. In its recent board meeting, concerns were raised by the members on the efficiency of the marketing campaign currently being used. The board decides to rope in an analytics professional to improve the existing campaign. The Company want to analyze the data to get a fair idea about the demand of customers which will help them in enhancing their customer experience.

1.2. key questions:

- Do men tend to prefer SUVs more compared to women?
- What is the likelihood of a salaried person buying a Sedan?
- What evidence or data supports Sheldon Cooper's claim that a salaried male is an easier target for a SUV sale over a Sedan sale?
- How does the amount spent on purchasing automobiles vary by gender?
- How much money was spent on purchasing automobiles by individuals who took a personal loan?
- How does having a working partner influence the purchase of higher-priced cars?

2. Data Description

Variable	Description
Age	The age of the individual in years.
Gender	The gender of the individual, categorized as Male or Female.
Profession	The occupation or profession of the individual.
Marital Status	The marital status of the individual, such as Married or Single.
Education	The educational qualification of the individual – Graduate or Post Graduate.
No of Dependents	The number of dependents (e.g., children, elderly parents) that the individual supports financially.
Personal Loan	A binary variable indicating whether the individual has taken a personal loan – "Yes" or "No".
House Loan	A binary variable indicating whether the individual has taken a housing loan – "Yes" or "No".
Partner Working	A binary variable indicating whether the individual's partner is employed – "Yes" or "No".
Salary	The individual's salary or income.
Partner Salary	The salary or income of the individual's partner, if applicable.
Total Salary	The total combined salary of the individual and their partner (if applicable).
Price	The price of a product or service.
Make	The type of the automobile.

2.1 Dataset Insights and Cleaning Summary:

- The dataset comprises 1,581 rows and 14 columns.
- No duplicate records were found in the dataset.

Gender Column

- 53 missing values were identified.
- Two incorrect entries — "Femal" and "Femle" — were corrected to "Female".
- The 53 null values were imputed with "Male" based on contextual assumptions.

Partner Salary Column

- 106 entries were missing.
- For entries where the partner is not employed, the partner salary was set to 0.
- For 16 cases where the partner is employed but salary was missing, the partner's salary was computed as: Partner Salary = Total Salary – Individual Salary

3. Univariate Analysis

3.1. Individual salary

- Most customers earn between $50,000 and $70,000. Median salary is around $60,000.
- The peak salary group is around $58,000 to $60,000 — this range has the highest number of people.
- The salary distribution is normal. The boxplot shows no outliers, so the salary data is clean and consistent.

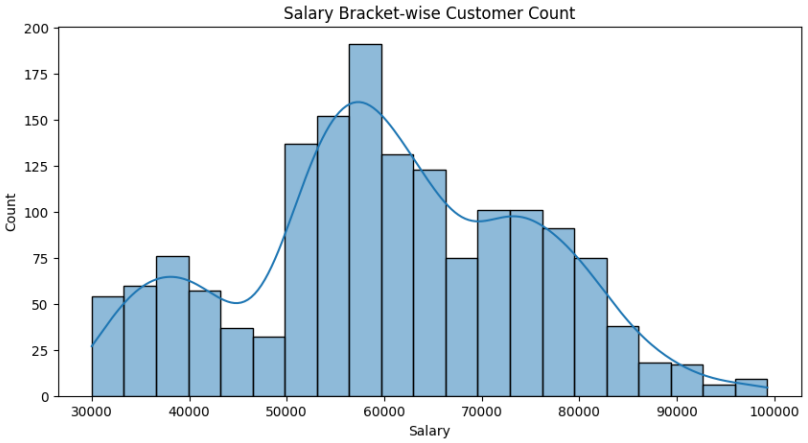


Figure 1

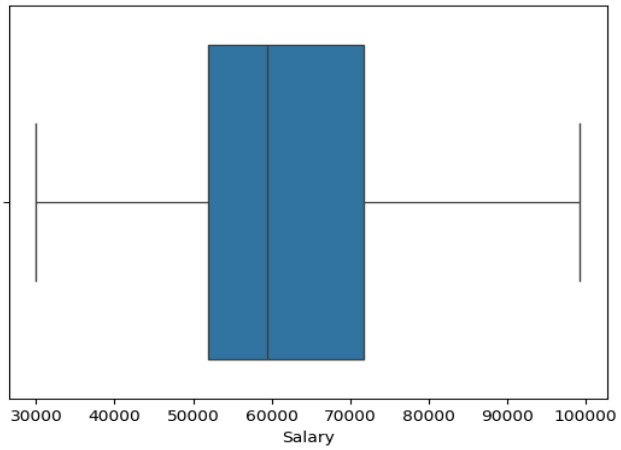


Figure 2

3.2 Partner's salary

- Most partners have low or no income. very few partners have high salaries.
- The distribution is right-skewed.
- High partner salary is less common but impactful.

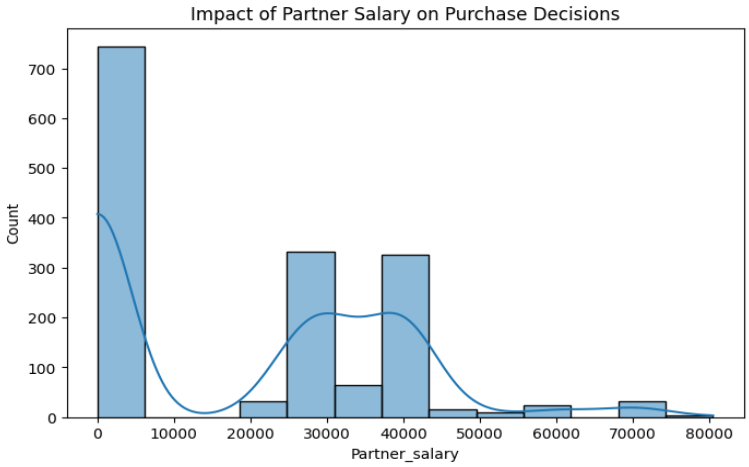


Figure 3

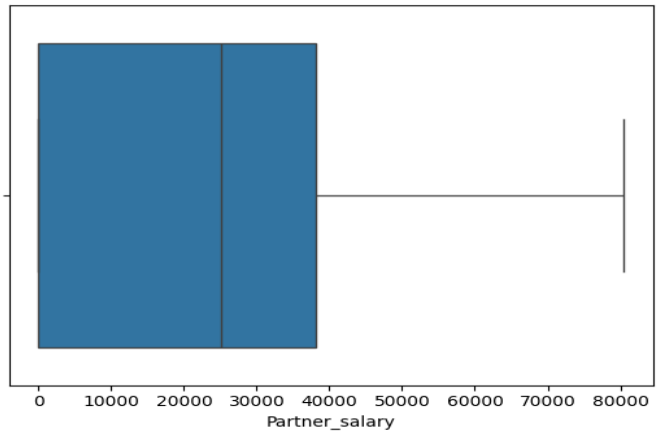


Figure 4

3.4 Total Salary

There is lot of outliers present in total salary data. These Outliers in total salary are likely due to high individual and partner salaries, while most values remain within a normal range.

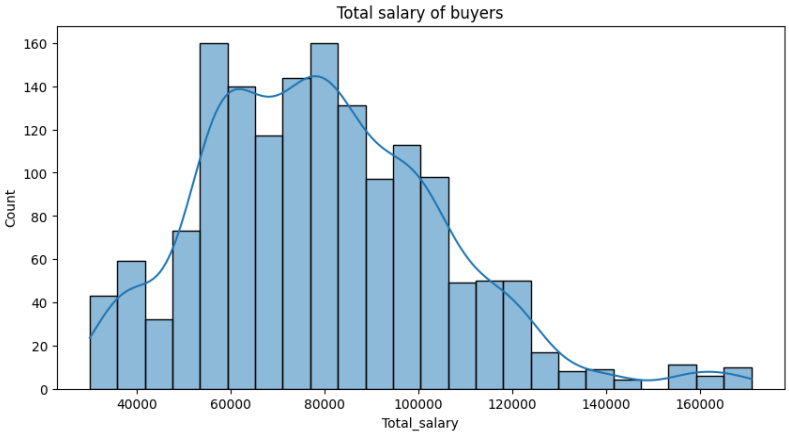


Figure 5

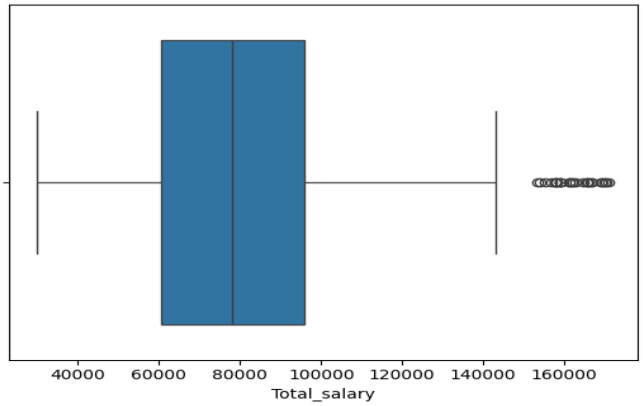


Figure 6

3.4 Car price

The median price point is $31,000. The price distribution is right-skewed. the car price varies depends on model SUV, Sedan, Hatchback versions.

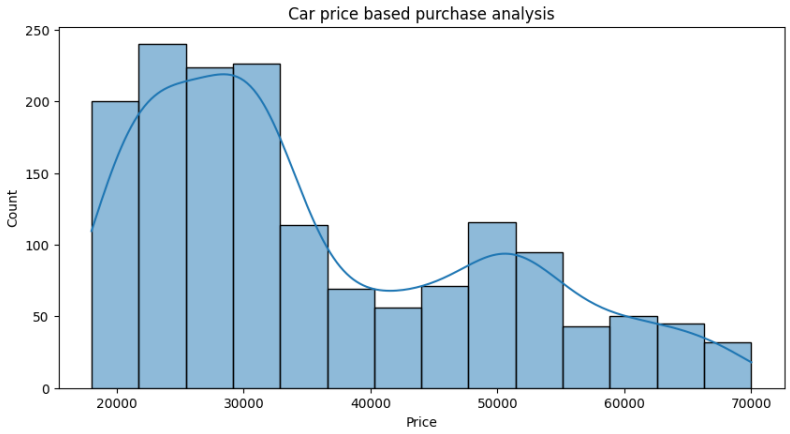


Figure 7

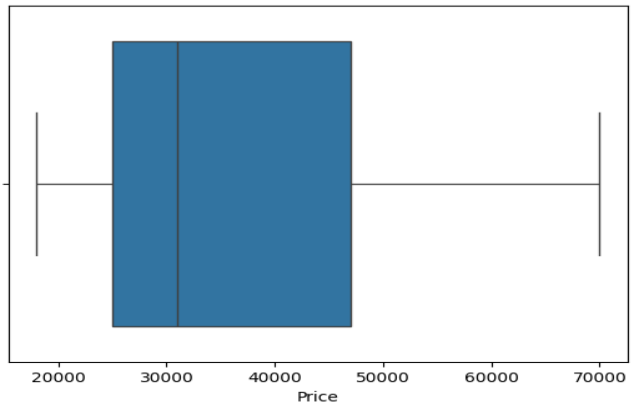


Figure 8

4. Bivariate Analysis

4.1 Correlation Matrix

Key Observations from the Heatmap:

- Price shows a positive correlation with Age, Partner Salary, and Total Salary, indicating that older individuals and those with higher household income tend to spend more on cars.
- Total Salary is strongly correlated with Individual Salary, as expected. However, Partner Salary demonstrates a slightly stronger influence on Total Salary, highlighting the impact of dual-income households.
- A negative correlation exists between Age and Number of Dependents. as individuals grow older, the number of financial dependents tends to decline.

Figure 9

4.2 EDA-Car purchasing analysis

4.2.1 Gender based purchase decision

- Male individuals mostly prefer Hatchbacks, followed closely by Sedans.
- Female individuals strongly prefer SUVs, with Sedans being the second choice.
- Their purchasing trends are clearly distinct, showing different priorities and preferences between genders.

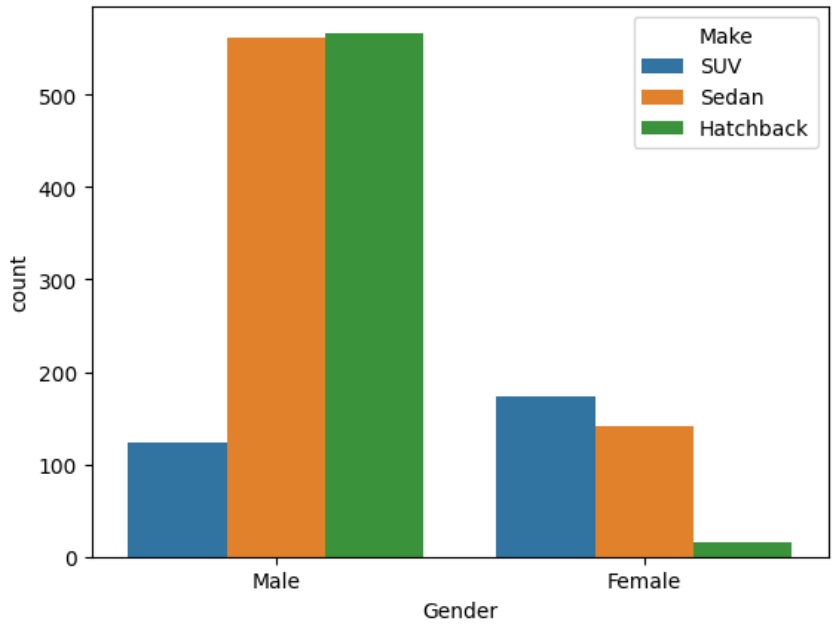


Figure 10

4.2.2 Profession Based car purchase decision

- Salaried individuals tend to prefer Sedans over SUVs when purchasing a car.
- Business individuals mostly prefer Sedans, followed by Hatchbacks in their purchase choices.

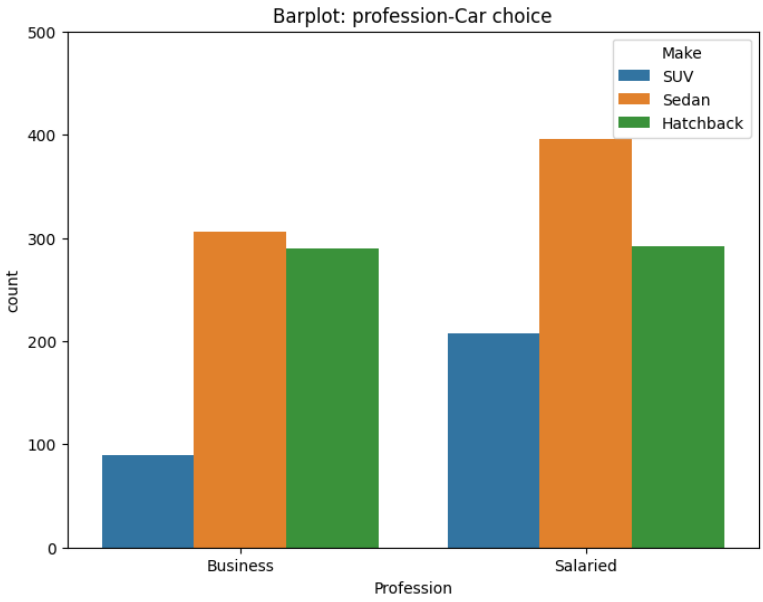


Figure 11

4.2.3 Profession-Gender based purchase analysis

- Businesswomen and salaried women mostly prefer SUVs, followed by Sedans.
- Male business professionals show a stronger preference for Hatchbacks.
- Salaried male individuals tend to prefer Sedan models than other.
- As per analysis, the likelihood of a salaried individual purchasing a Sedan is 44.20%.

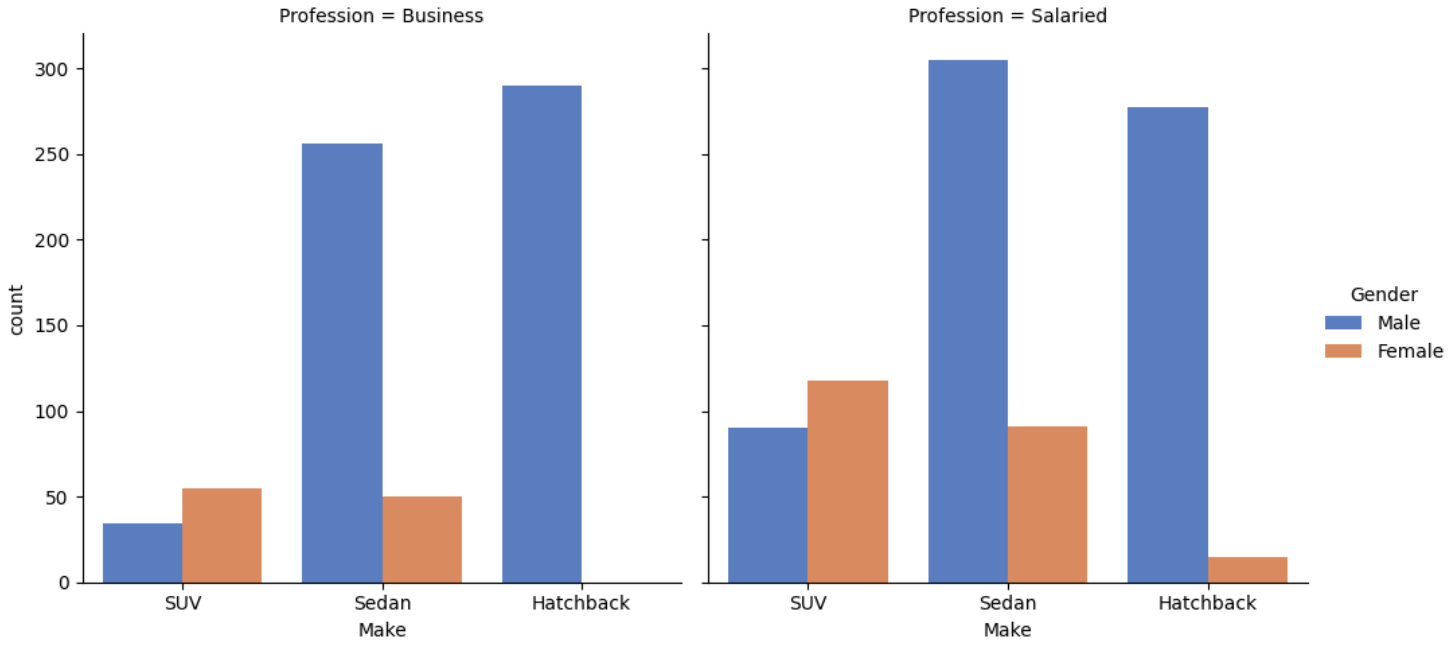


Figure 12

4.2.4 Gender-Price Analysis

Females tend to spend more on cars compared to males.
About 75% of male purchases are below $37,000, while 75% of female purchases are $38,000 and above.
Outliers are seen in male spending, showing a few spend much more.

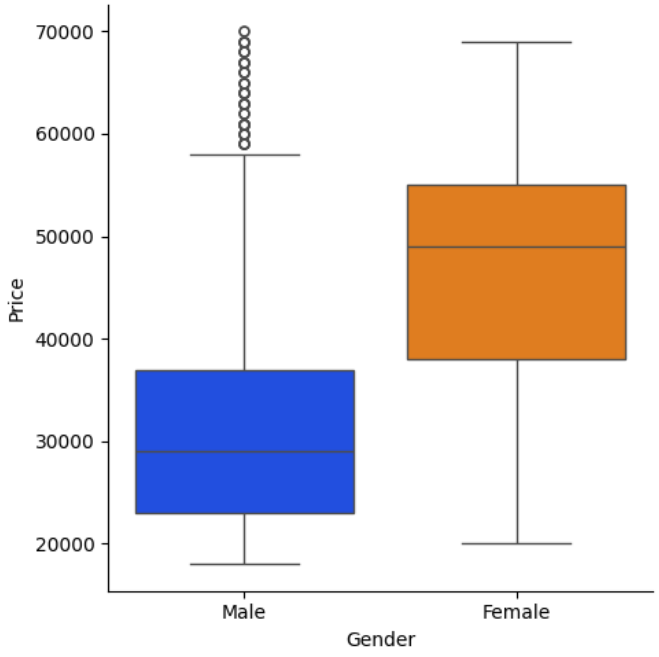


Figure 13

4.3 Purchase analysis based on car model price

SUVs and Sedans are generally priced higher than Hatchbacks.

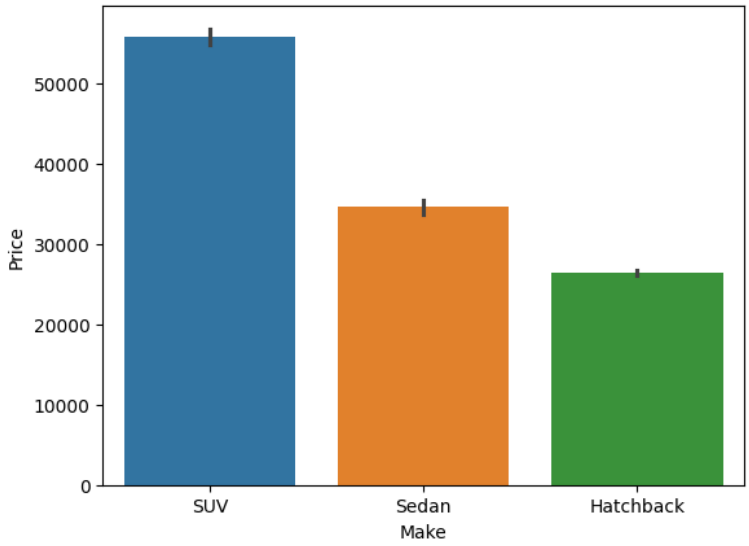


Figure 14

4.4 Purchasing pattern for female with respect to model

- Female buyers show a strong preference for SUVs, which are costlier.
- They also lean toward Sedans especially higher-priced variants, showing a trend of spending more per vehicle.

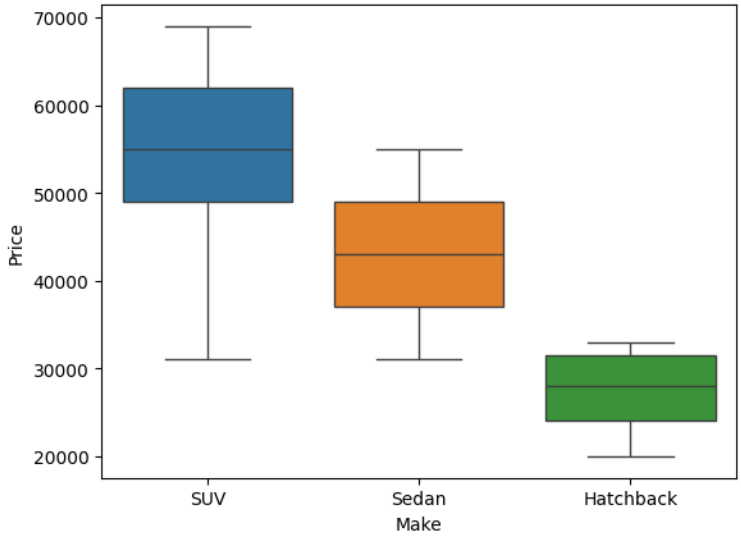


Figure 15

4.5 Purchasing pattern for male with respect to model

- Male buyers mostly prefer Hatchbacks, followed closely by Sedans. but they generally pick lower-priced Sedan models (mean ≈ $33,639).
- Few male buyers go for SUVs, and even when they do, it's less frequent, though the high SUV prices cause outliers in their purchase data.

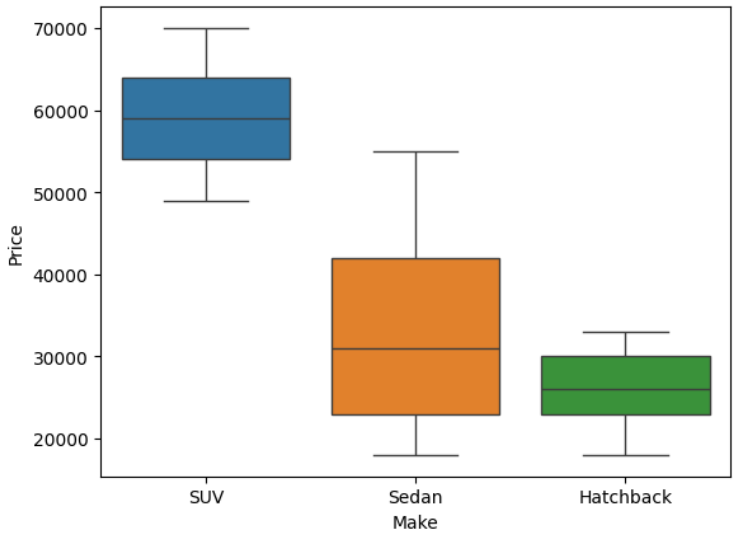


Figure 16

4.6 Impact of Financial Loans on Vehicle Purchase Decisions

- **Personal Loans Have Limited Impact:** People who have personal loans don't seem to spend much differently on cars. Nearly 75% of them buy vehicles priced under $45,000, and the usual spending range stays around $31,000 to $32,000, which is pretty close to those who don't have personal loans.
- **House Loans Influence Car Buying Decisions**: On the other hand, home loans seem to affect how much people spend. About 75% of buyers with home loans go for cars under $36,000, and the average spending drops to around $31,777.61, which is clearly lower than those without home loans.
- **Why It Matters:** This shows that having a house loan might limit how much someone is willing or able to spend on a car, pushing them towards more budget-friendly options.

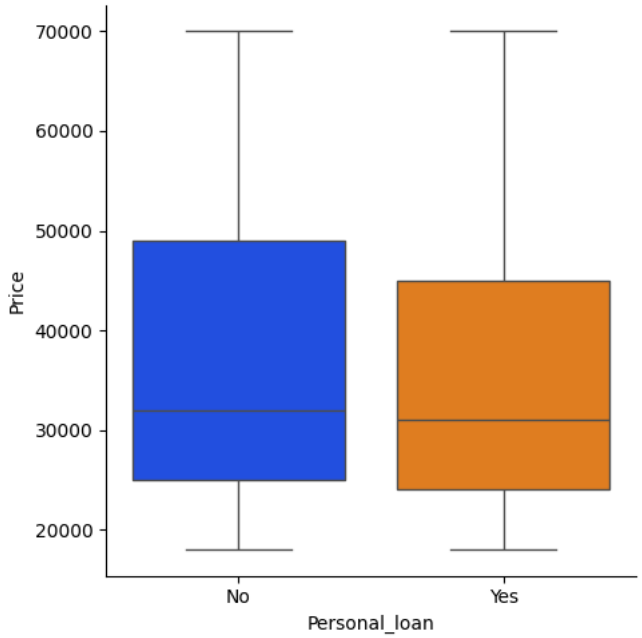


Figure 17

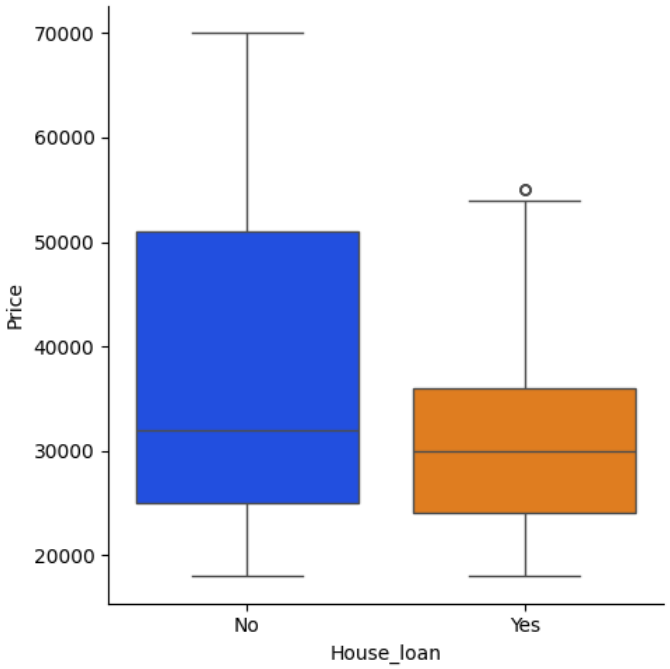


Figure 18

4.7 Partner Working analysis on car purchase

There's no significant difference in buying behavior based on whether the partner is employed or not. Purchase patterns remain largely similar, regardless of the partner's working status.

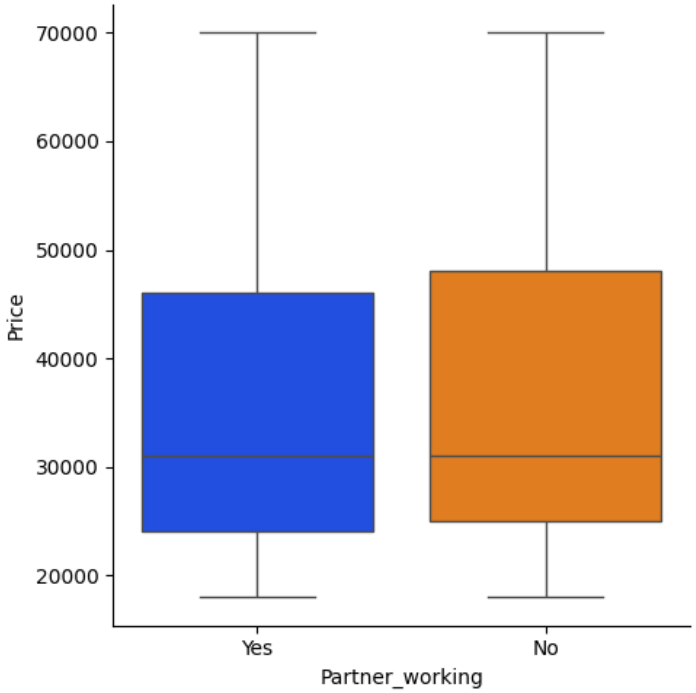


Figure 19

5. Q & A

1. Do men tend to prefer SUVs more compared to women?

A: No, Female prefers SUV than male

2. What is the likelihood of a salaried person buying a Sedan?

A: The likelihood of a salaried individual purchasing a Sedan is 44.20%.

3. What evidence or data supports Sheldon Cooper's claim that a salaried male is an easier target for a SUV sale over a Sedan sale?

A: The data strongly contradicts Sheldon Cooper's claim, salaried male individuals predominantly prefer sedan models over other vehicle types.

4. How does the amount spent on purchasing automobiles vary by gender?

A: There is a clear difference in spending between male and female individuals. Female buyers spend more on average ($47,705.17) compared to male buyers ($32,416.13). Most female buyers go for SUVs (173 counts, avg. $53,479.77), followed by Sedans (141 counts, avg. $42,773.05), and very few prefer Hatchbacks (15 counts, avg. $27,466.67).

On the other side, male buyers mostly choose Hatchbacks (567 counts, avg. $26,447.97), then Sedans (561 counts, avg. $32,550.80), and lastly SUVs (124 counts, but with the highest avg. $59,096.77).

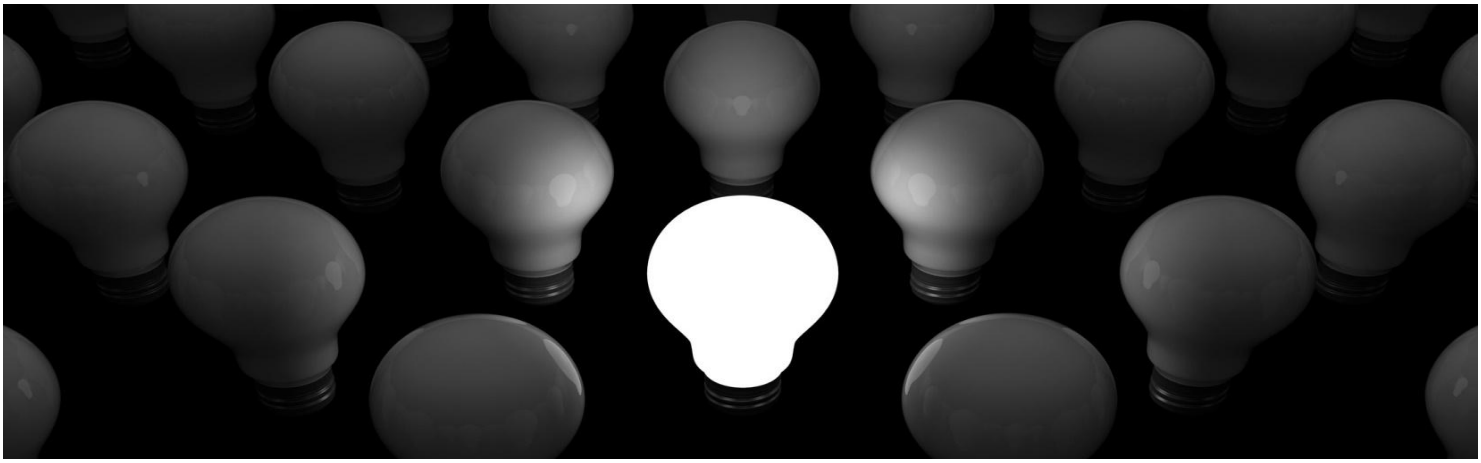
So, females prefer high-end models like SUVs, while males prefer budget-friendly models like Hatchbacks and Sedans.

5. How much money was spent on purchasing automobiles by individuals who took a personal loan?

A: Individuals who took a personal loan spent an average of $34,457.07 on automobiles. The maximum amount spent was $70,000, and the minimum was $18,000.

6. How does having a working partner influence the purchase of higher-priced cars?

A: There’s no significant difference in buying behavior based on whether the partner is employed or not. Purchase patterns remain largely similar, regardless of the partner’s working status.



6. Actionable Insights

- **Car Preferences Vary by Gender:** Male customers mostly prefer Hatchbacks, followed by Sedans. Female customers strongly prefer SUVs, then Sedans.
- **Spending Difference Between Genders:** Females spend more on average ($47,705.17) than males ($32,416.13). The higher spend is due to SUV preference.
- **Model and Price Relation:** SUVs and Sedans are priced higher than Hatchbacks. These two models contribute more to total revenue.
- **Profession-Based Buying Pattern:** Salaried individuals have a 44.2% chance of buying Sedans. Business individuals also prefer Sedans, followed by Hatchbacks.
- **Age vs. Spending:** As age increases, spending also increases. Older customers are more likely to go for higher-priced cars.
- **Loan Impact on Spending:** Personal loans don’t make much difference — buyers still spend around $31,000 to $32,000. House loan holders mostly buy cars under $36,000. Their average spend drops to $31,777.61.
- **Partner Working Status:** Whether the partner is working or not doesn’t affect purchase decisions much. Spending patterns are similar in both cases.



7. Business Recommendations:

1. **Segment-Based Marketing Campaigns**
Develop distinct marketing content for male and female customers:
Men-focused ads: Emphasize fuel efficiency, sporty design, and tech features in Hatchbacks and Sedans. Use direct, performance-driven messaging.
Women-focused ads: Highlight safety, spacious interiors, and premium comfort in SUVs and Sedans. Use lifestyle-based messaging to match their purchase behavior.

2. Expand the Sedan Lineup
Sedans are the most commonly chosen model across both salaried and business segments.
Introduce new Sedan variants with flexible pricing tiers.
Focus on modern styling, comfort, and mileage, which are common decision factors.

3. Gender-Based Offers to Boost Conversion
Female customers spend more on average.
Design exclusive offers or festive discounts for women buyers.
Bundle perks like priority delivery, free insurance, or accessories to increase value.

4. **Age-Specific Luxury Marketing**
As age rises, so does average spending.
Launch luxury upgrade programs targeting 35+ age groups.
Campaigns should showcase elegance, status, and long-term value of premium models.

5. Loan-Friendly Promotions
Spending patterns shift slightly based on loan types:
For house loan holders, introduce low-down-payment and EMI holiday schemes.
For general loan holders, offer finance bundles tied to mid-range models to improve affordability.
No special offers needed for personal loan customers, as their spending is normal.

6. Couple & Family-Centric Campaigns
No major difference based on partner's work status, but:
Create packages like "Family First Offers" with add-ons (e.g., kids' safety seats, extended warranty).
Target households as a unit, focusing on joint decision-making.

7. Leverage SUV Preferences Among Women
Since women lean toward SUVs:
Identify top-rated SUV features (like height, boot space, safety tech).
Highlight these aspects in female-centric promotions – both online and in showroom banners.

8. Boost Online Visibility & Offers
Use the company website to market car models aligned with buyer preferences.
Introduce online-only discounts, exchange offers, and real-time availability to attract digital-first customers.