

# Capstone Project

Laptop purchase behaviour  
Price & Quality

## GROUP MEMBERS

Gurpreet Singh	(301346925)
Sourav	(301417782)
Pankaj	(301418786)
Chandan Suhruth	(301322272)
Abhishek Kulkarni	(301369504)



Vision research

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# Executive Summary



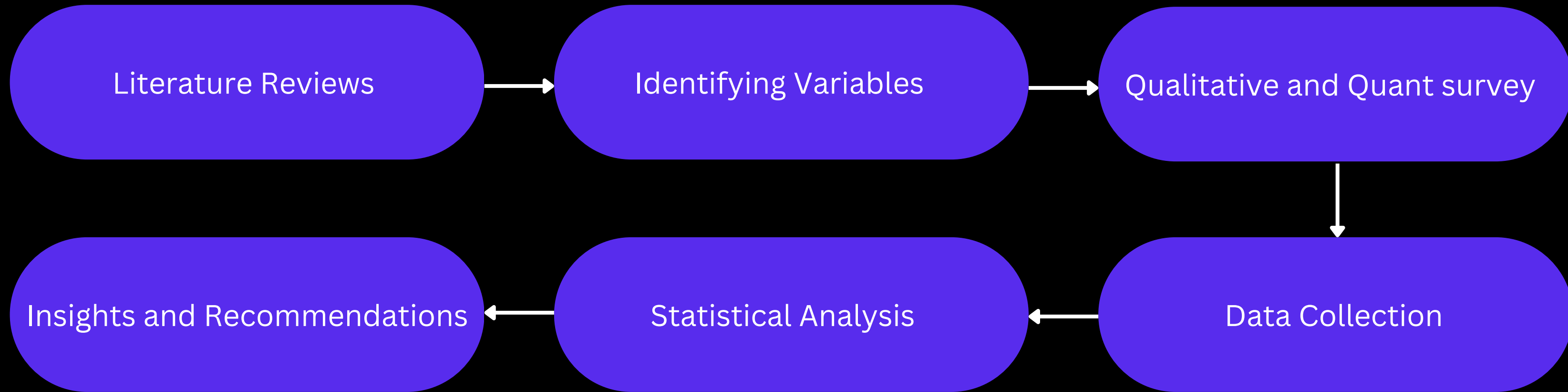
## ENVIRONICS ANALYTICS

- Envision, a prominent market research firm, is tasked with understanding Millennial and Gen Z consumer behavior. The client seeks insights to enhance engagement and resonance with these pivotal demographics. The analysis aims to uncover factors influencing purchasing behavior, guiding tailored strategies. Envision's data-driven approach will empower informed decisions and strategic initiatives.

## Research Model

- Our research investigates how price and quality impact laptop purchase behavior, employing regression, correlation, and various statistical models. By combining qualitative and quantitative methods, we aim to understand and predict consumer preferences accurately. Our approach offers valuable insights for retailers and manufacturers, aiding in optimizing product offerings and marketing strategies.
- Our research journey began with identifying key variables—price and quality—followed by data collection through surveys and market analysis. We then employed statistical analysis to understand the relationship between these variables and consumer behavior, leading to model development and actionable insights for stakeholders.

- Research Journey:



- We analysed the impact of price and quality on laptop purchases using both qualitative and quantitative methods. For qualitative research, we conducted focus groups and performed analysis using MAXQDA. Statistical models such as regression, correlation and survey for data collections were implemented for quantitative.
- By utilising the above research methods, we gained insights into their preferences, purchasing patterns, and key influencers such as price and quality, ultimately enhancing the understanding of these demographics and their purchase behaviour.

# Research Methodology



## How

We utilized qualitative research via focus groups to gather insights, and MAXQDA aided in analyzing the data, providing essential variables for our research on consumer behavior.

## Why

Our model integrates qualitative and quantitative approaches to unravel how price and quality influence Millennial behavior, offering retailers valuable insights to optimize product strategies and meet consumer demands effectively.

## Variables

Brand  
Features  
Finance  
Performance  
Display  
Ecosystem  
.





# QUALITATIVE RESEARCH



SAMPLE DESCRIPTION

Area	Urban (Toronto)	Urban (Calgary)	Sub- Urban (Halifax,)	Total
Focus Groups	4	4	4	12 groups

AREA	URBAN	URBAN	SUB - URBAN
LOCATION	✓ Toronto	✓ Calgary	✓ Halifax
AGE	1 group- 18 to 25 years 1 group- 25 to 35 years 1 group- 35 to 45 years 1 group- 45 to 55 years	1 group- 18 to 25 years 1 group- 25 to 35 years 1 group- 35 to 45 years 1 group- 45 to 55 years	1 group- 18 to 25 years 1 group- 25 to 35 years 1 group- 35 to 45 years 1 group- 45 to 55 years

SAMPLE DESCRIPTION

GENDER	50% males and 50% females per group	As per Urban	As per Urban
EDUCATION	✓ Minimum Bachelor's Degree	As per Urban	As per Urban
TECHNOLOGY	✓ Must have regular access to computer and laptop with internet connectivity	As per Urban	As per Urban
USER	✓ Purchased or looking forward to purchasing a laptop.	As per Urban	As per Urban
DEMOGRAPHICS	✓ International and Domestic students ✓ Employees	As per Urban	As per Urban



## ACTUAL DESIGN

For the purposes of this project, a single focus group comprising 8 respondents was conducted to gather valuable insights. The research session took place at Centennial College on February 8, 2024 for 45 mins.

All participants involved in the focus group were international students enrolled at Centennial College. This methodology was chosen to ensure a diverse range of perspectives and experiences among the students of the college, thereby enriching the depth of the findings obtained from the research.

## NOTE OF CAUTION

A note of Caution should be exercised because this research was based on the opinions of 8 participants, making it qualitative rather than quantitative.

Additionally, since the respondents were students, their knowledge might be limited, potentially impacting the accuracy of their responses.

# Qualitative Analysis - Results

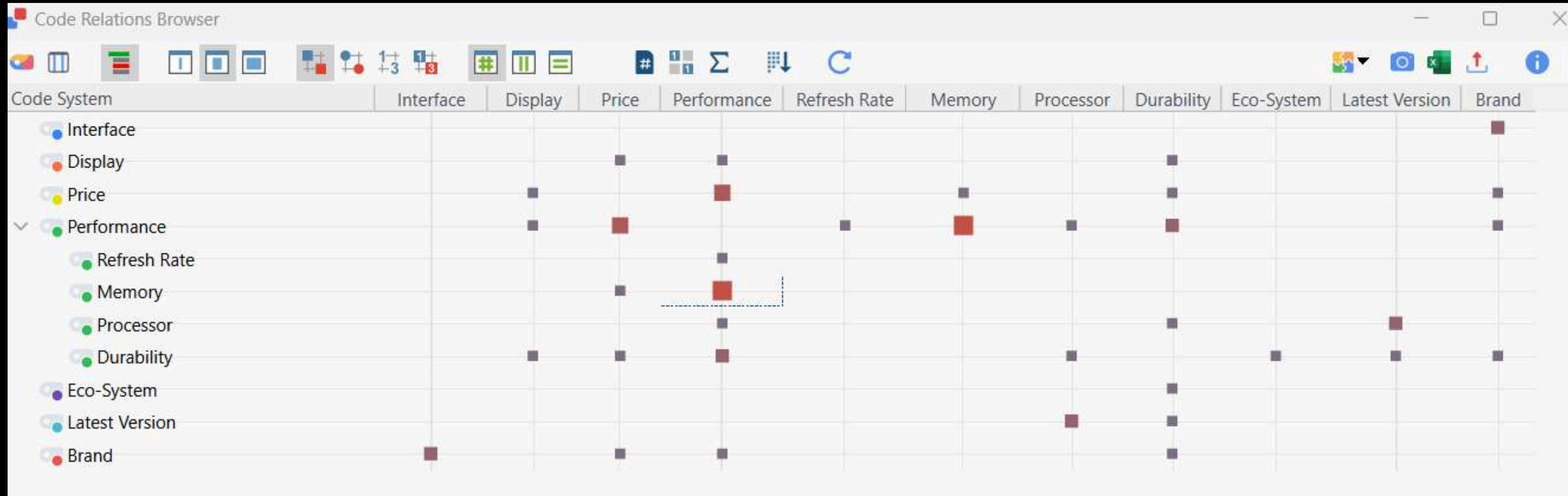
Code Frequencies

Unit: Segments with code

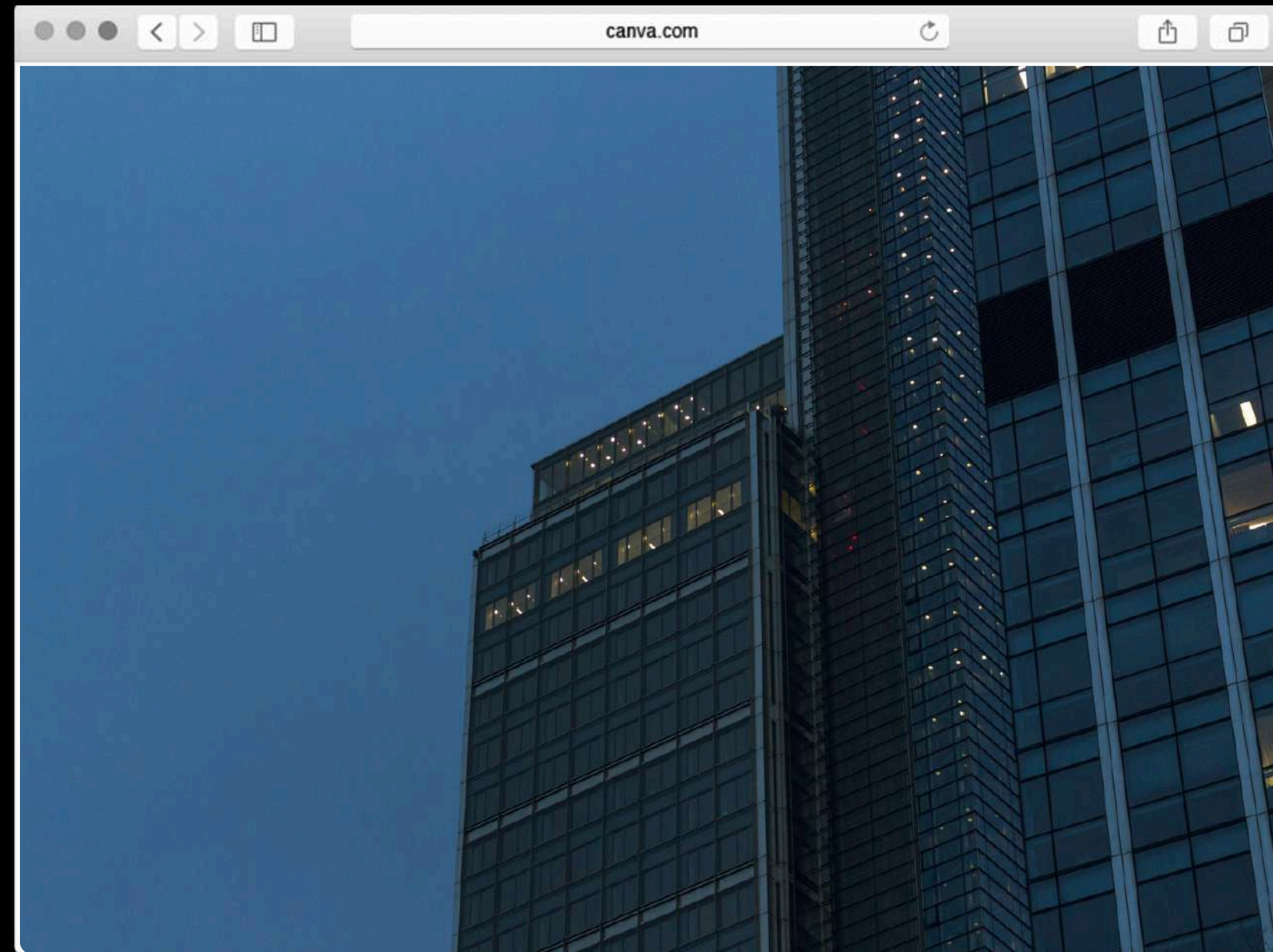
	Frequency	Percentage
Performance	13	16.9
Eco-System	11	14.3
Latest Version	7	9.1
Brand	8	10.4
Display	4	5.2
Overall Features	3	3.9
Discount Influence	4	5.2
Customer Service	3	3.9
Interface	4	5.2
Design	3	3.9
Refresh Rate	2	2.6
Memory	6	7.8
Processor	4	5.2
Durability	5	6.5
TOTAL	77	100.0



# Key Influencers in Laptop Purchase Decisions







## PHASE 2

# Quantitative Research



# Research Design

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Quantitative Objectives

Target Definition

Questionnaire Prepared

Survey Publication

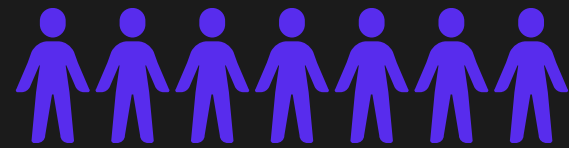
Data Collection

Analysis

Interpretation

Recommendations

From defining targets and preparing questionnaires to publishing surveys, collecting and analyzing data, interpreting results, and offering recommendations, our roadmap ensures a comprehensive approach to achieving quantitative objectives.



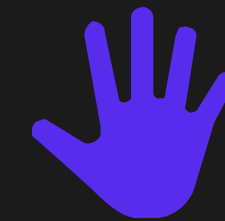
## Sample Size

Estimate 100  
Actual 63  
Usable 59



## Exclusion criteria

Under18 & Over 45  
Don't have Laptop



## Data collection

Online Survey

# Quantitative Objectives



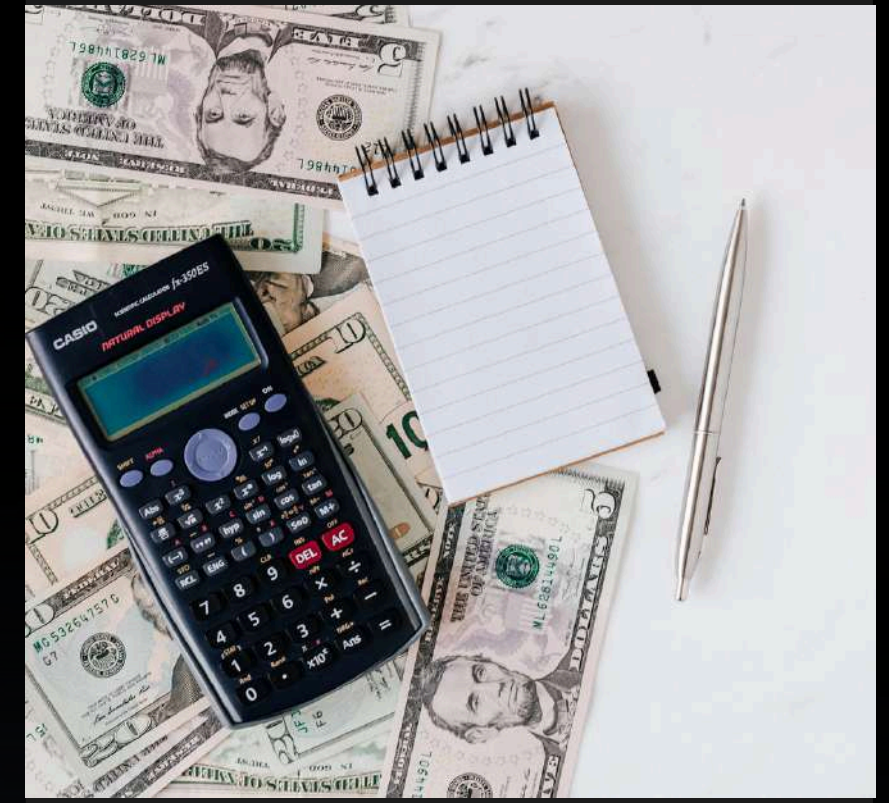
## OBJECTIVE 1

To understand the effects of demographic variables on BRAND, PERFORMANCE, DISPLAY, ECOSYSTEM, FEATURES, FINANCE, and PRICE and QUALITY of the laptop



## OBJECTIVE 2

To validate the relationship between BRAND, PERFORMANCE, DISPLAY, ECOSYSTEM, FEATURES, FINANCE and PRICE and QUALITY of the laptop



## OBJECTIVE 3

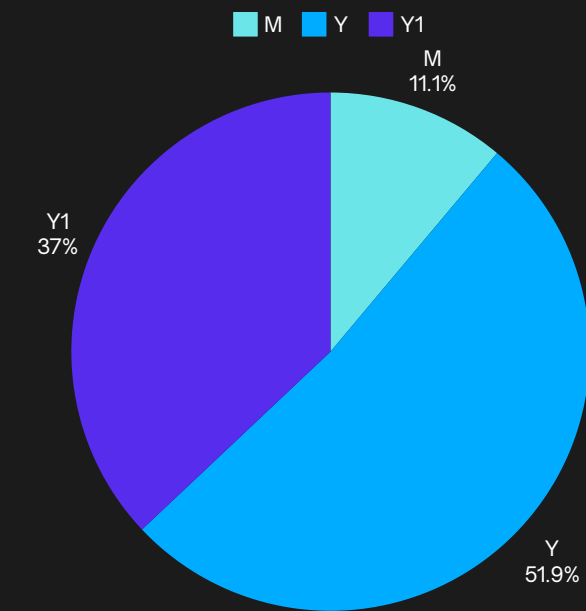
To validate the impact of BRAND, PERFORMANCE, DISPLAY, ECOSYSTEM, FEATURES, FINANCE on PRICE and QUALITY of the laptop.



# Data cleaning

- Data Importation
- Data Segmentation
- Column Optimization
- Variable Averaging
- New Variable Column Creation
- Binary Target Variable Conversion
- Missing Values(Numeric)= Mean
- Missing Values(Categorical)=Mode

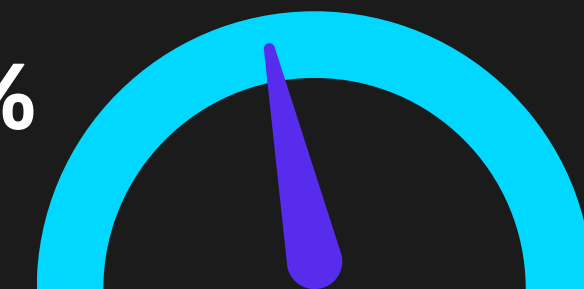
# Exploratory Analysis



## USAGE

\*Young people with age of 25-34 uses laptop are high users.

44%

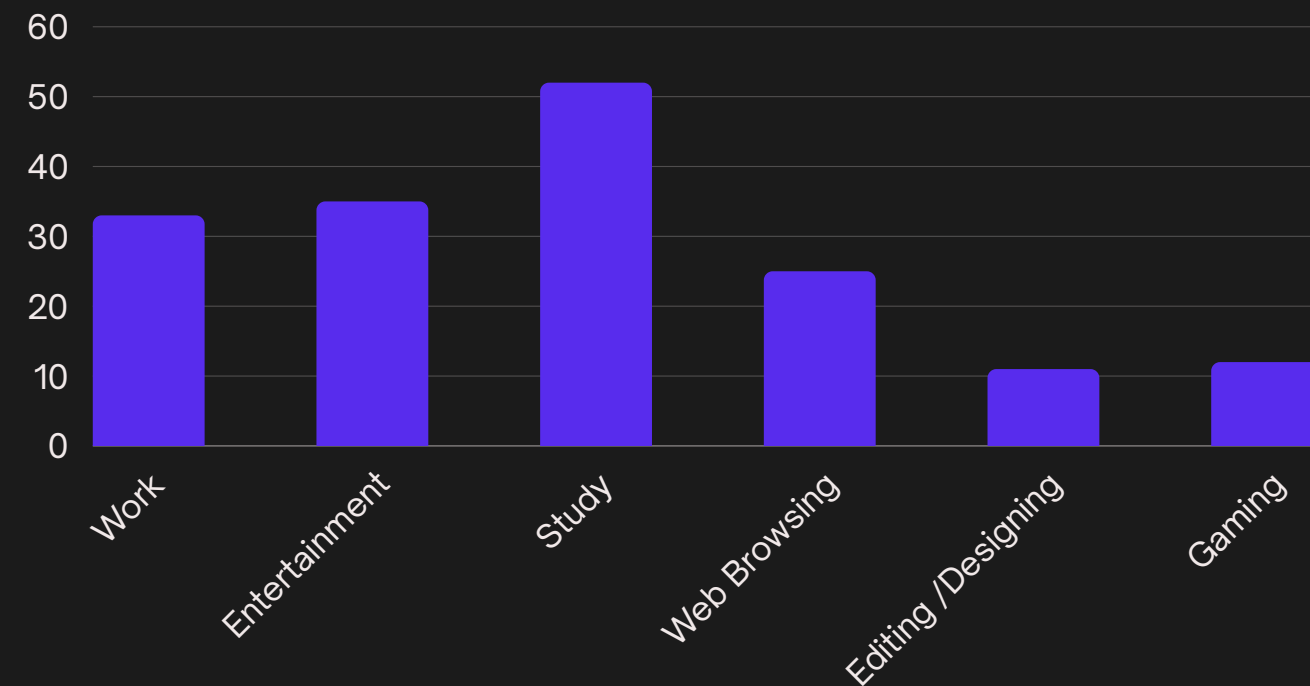


## PLANING TO BUY

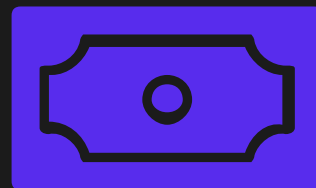
\*44% of students who attended the survey are planning to buy a laptop.



# Exploratory Analysis



\*Laptop are mainly used for study and secondly used for entertainment and work



**\$1492.55**

\*People estimated Average \$1492.55 as a decent price of a laptop according to their preference of variables.

# Exploratory Analysis

Brand known for

Apple	Brand reputation
Dell	Features
HP	Performance
Lenovo/ Acer	Price



In our sample most people are degree holders, employed earning basic pay.



Frequent Upgraders are jobseekers, People who are full time employed are minimal upgraders.

To understand the effects of demographic variables

CHI\_SQ

Ho: there is NO significant association between Upgrading frequency and Buy new launch .

- Frequent upgraders are tend to buy a newly launch product
- Minimal upgraders are less likely to buy a newly launch product

UPGRADING FREQUENCY/BUY NEW LAUNCH	MAY BE	NO	YES
FREQUENT UPGRADERS	4	0	2
MINIMAL UPGRADERS	6	11	1
OCCASIONAL UPGRADERS	26	3	4

CHI-SQ	P-VALUE
21.13	0.0003

\*Null hypothesis Rejected

To understand the effects of demographic variables

# ANOVA

Ho: There is NO difference b/w means of Quality and Employment status.

EMPLOYMENT STATUS/IMPORTANCE-QUALITY	IMPORTANCE-QUALITY	F-VALUE	P-VALUE
FREELANCER	4.75	4.56	0.0064
FULL TIME	4.05		
JOSEEKER	4.17		
PART TIME	4.82		

\*Null hypothesis Rejected

# ANOVA

Ho: There is NO difference b/w means of price and Income.

INCOME/IMPORTANCE-PRICE	IMPORTANCE-PRICE	F-VALUE	P-VALUE
\$150,000 OR MORE	4.0	2.35	0.044
\$100,000-\$149,999	3.0		
\$75,000-\$99,999	4.0		
\$50,000-\$74,999	2.5		
\$25,000-\$49,999	3.6		
LESS THAN 25,000	4.2		
PREFER NOT TO SAY	3.6		

\*Null hypothesis Rejected

To validate the relationship between Independent and dependent variables.

# CORRELATION

Ho: No significant relationship between Price, Quality, Brand, Performance, Display, Finance, Feature, and Ecosystem.

Pearson Correlation Coefficients, N = 59 Prob >  r  under H0: Rho=0						
	BRAND	PERFORMANCE	FEATURES	DISPLAY	ECOSYSTEM	FINANCE
Importance-quality	0.36562 0.0044	0.53059 <.0001	0.46959 0.0002	0.31982 0.0135	0.36078 0.0050	0.38469 0.0026
Importance- price	0.58347 <.0001	0.36959 0.0040	0.51419 <.0001	0.48270 0.0001	0.39581 0.0019	0.41053 0.0012

Generated by SAS ('Local', W32\_10PRO) on April 15, 2024 at 09:48:13 AM

- Found that price has moderate positive linear relationship with Brand and Features.
- Higher the Price higher better the Brand Reputation and More Features in the laptop
- Found that Quality has moderate positive linear relationship with Performance.
- Higher the Quality better the performance of the laptop.
- Explains stat significant and strength of relation

\*Null hypothesis Rejected



To validate the relationship between Independent and dependent variables.

# CORRELATION

Ho: No significant relationship between Importance of price and importance of quality.

Pearson Correlation Coefficients, N = 59 Prob >  r  under H0: Rho=0		
	Importance- price	Importance-quality
Importance- price	1.00000	0.46515 0.0002
Importance- <u>quality</u>	<u>0.46515</u> 0.0002	1.00000

Generated by SAS ('Local', W32\_10PRO) on April 15, 2024 at 09:48:17 AM

- Found that importance of price has moderate positive linear relationship with importance of quality.
- Unit change in importance of price will increase the importance of quality by 46%

\*Null hypothesis Rejected

To validate the impact of Independent and dependent variables.

# REGRESSION

Ho: No significant effect of Brand, Performance, Display, Finance, Feature, and Ecosystem on Price

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	0.40834	0.17529	0.37300	5.43	0.0235
BRAND	0.02916	0.05306	0.02076	0.30	0.5848
DISPLAY	0.11348	0.04760	0.39068	5.68	<u>0.0205</u>

\*Null hypothesis Rejected

Display significance to Price

To validate the impact of Independent and dependent variables.

# REGRESSION

Ho: No significant effect of Brand, Performance, Display, Finance, Feature, and Ecosystem on Quality

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	0.64125	0.12424	0.80341	26.64	<.0001
PERFORMANCE	0.07591	0.02855	0.21324	7.07	<u>0.0102</u>

\*Null hypothesis Rejected

Performance significance to quality

# REGRESSION -MINING (QUALITY)

Data validation  
Train 95  
validation 5

Ho: No significant effect of Brand, Performance, Display, Finance, Feature, and Ecosystem on Quality.

Type 3 Analysis of Effects			
Effect	DF	Wald Chi-Square	Pr > ChiSq
PERFORMANCE	1	3.8784	0.0489

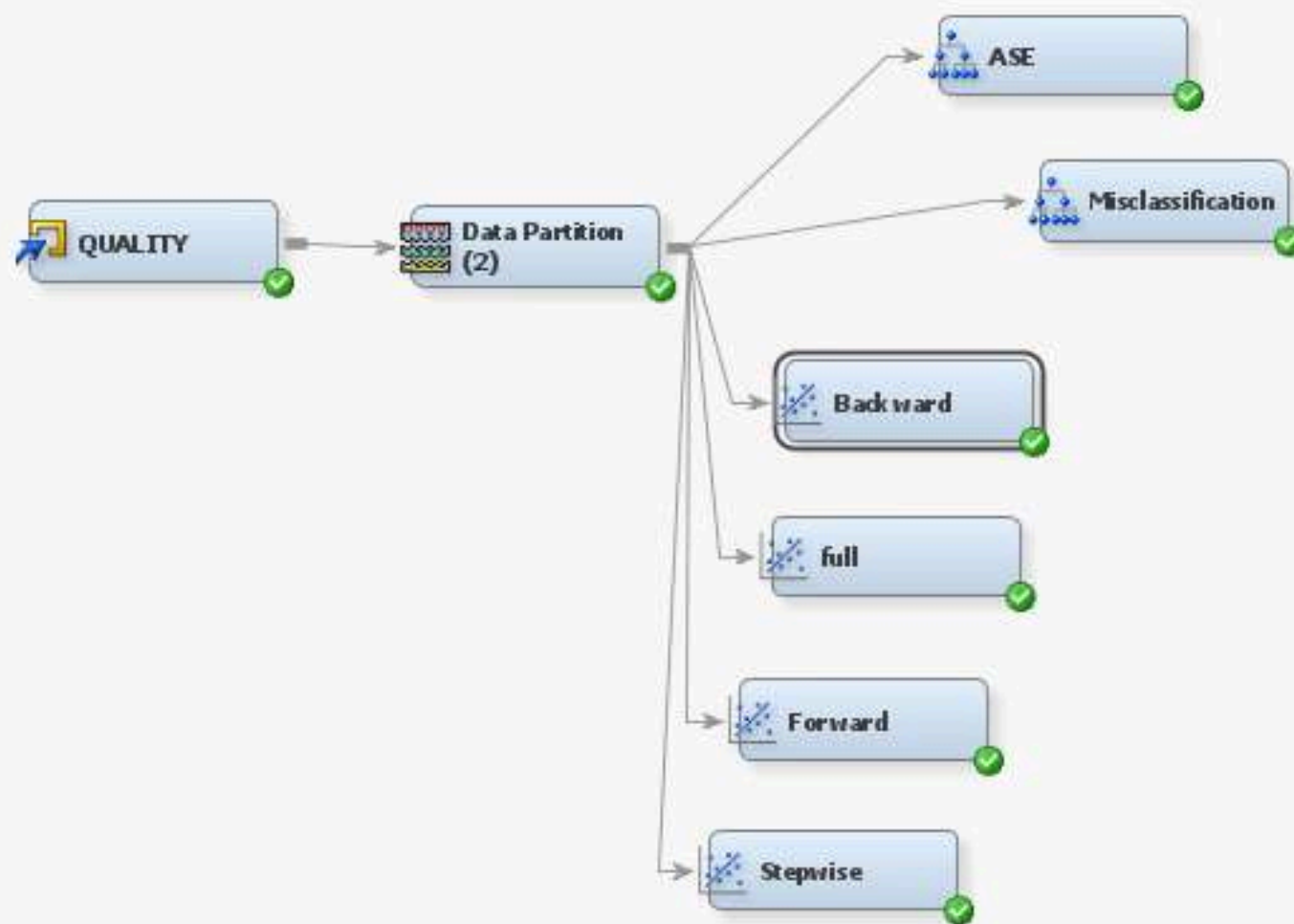
  

Analysis of Maximum Likelihood Estimates							
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq	Standardized Estimate	Exp(Est)
Intercept	1	-2.6193	2.6018	1.01	0.3141		0.073
PERFORMANCE	1	1.6133	0.8192	3.88	0.0489	0.7076	5.019

Odds Ratio Estimates	
Effect	Point Estimate
PERFORMANCE	5.019

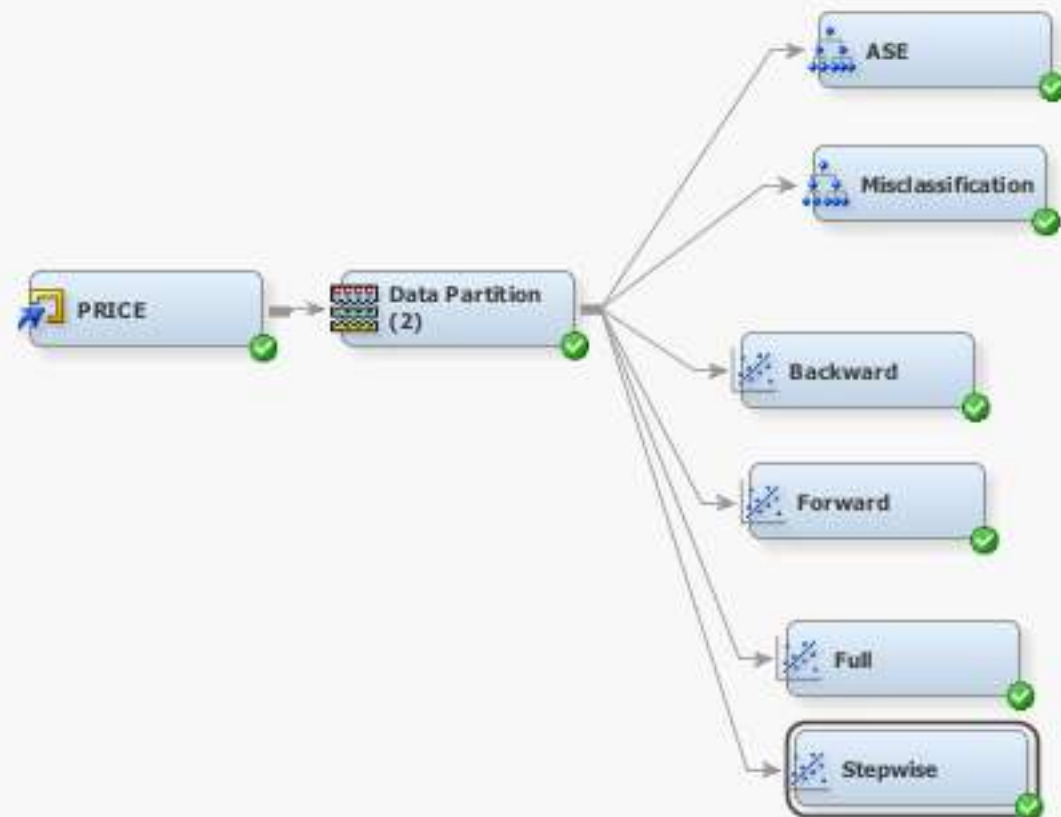
- Found that performance has significant effect on quality of the laptop.
- Odd ratio estimate is 5.019, one unit increase in performance will increase quality by 5X





# REGRESSION -MINING (PRICE)

Ho: No significant effect of Brand, Performance, Display, Finance, Feature, and Ecosystem on Price.



Likelihood Ratio Test for Global Null Hypothesis: BETA=0

-2 Log Likelihood	Likelihood			
Intercept Only	Intercept & Covariates	Ratio Chi-Square	DF	Pr > ChiSq
33.699	23.306	10.3929	1	0.0013

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq	Standardized Estimate	Exp(Est)
Intercept	1	-4.2679	2.2844	3.49	0.0617		0.014
DISPLAY	1	2.1977	0.8507	6.67	<u>0.0098</u>	1.0619	9.005

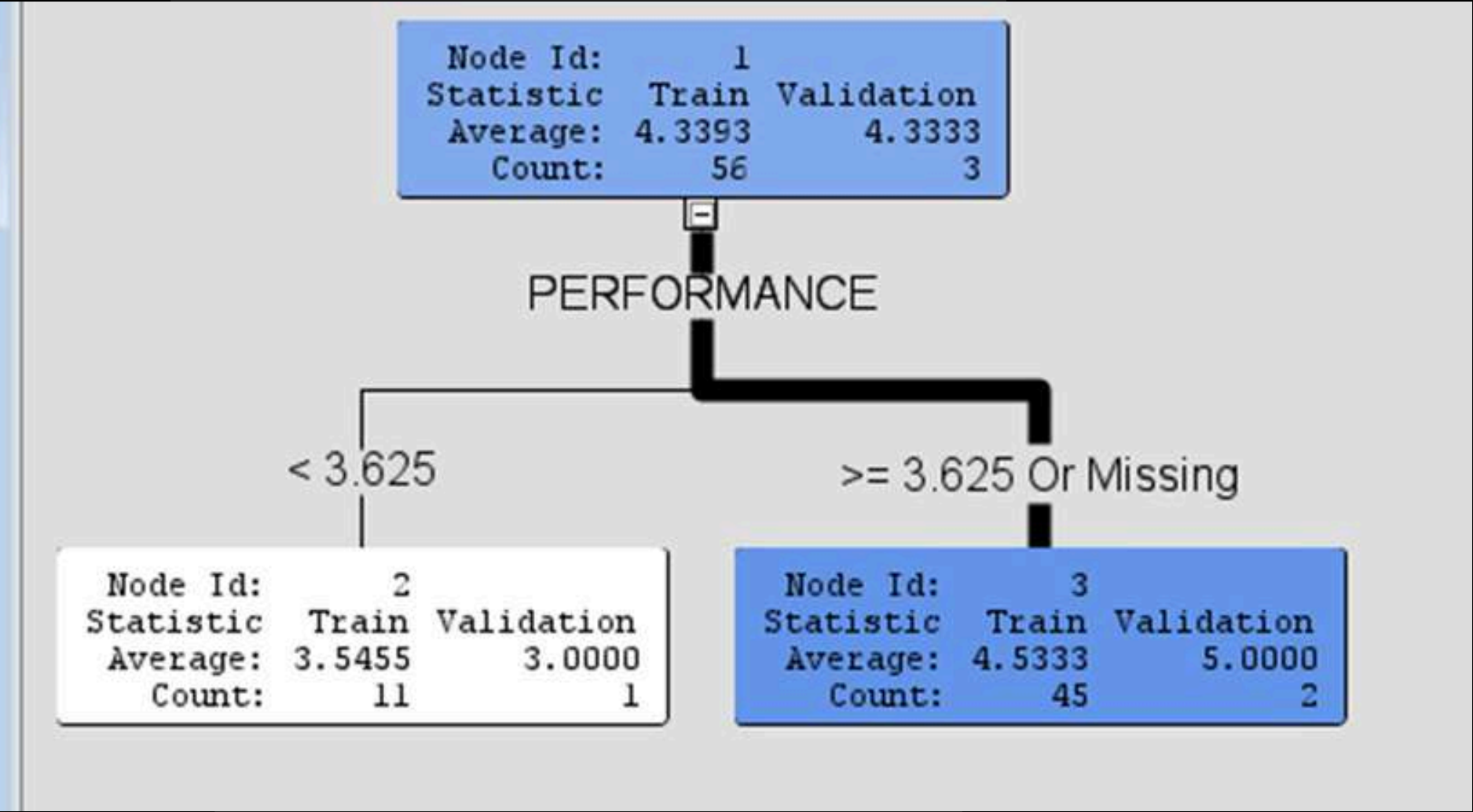
Odds Ratio Estimates

Effect	Point Estimate
DISPLAY	<u>9.005</u>

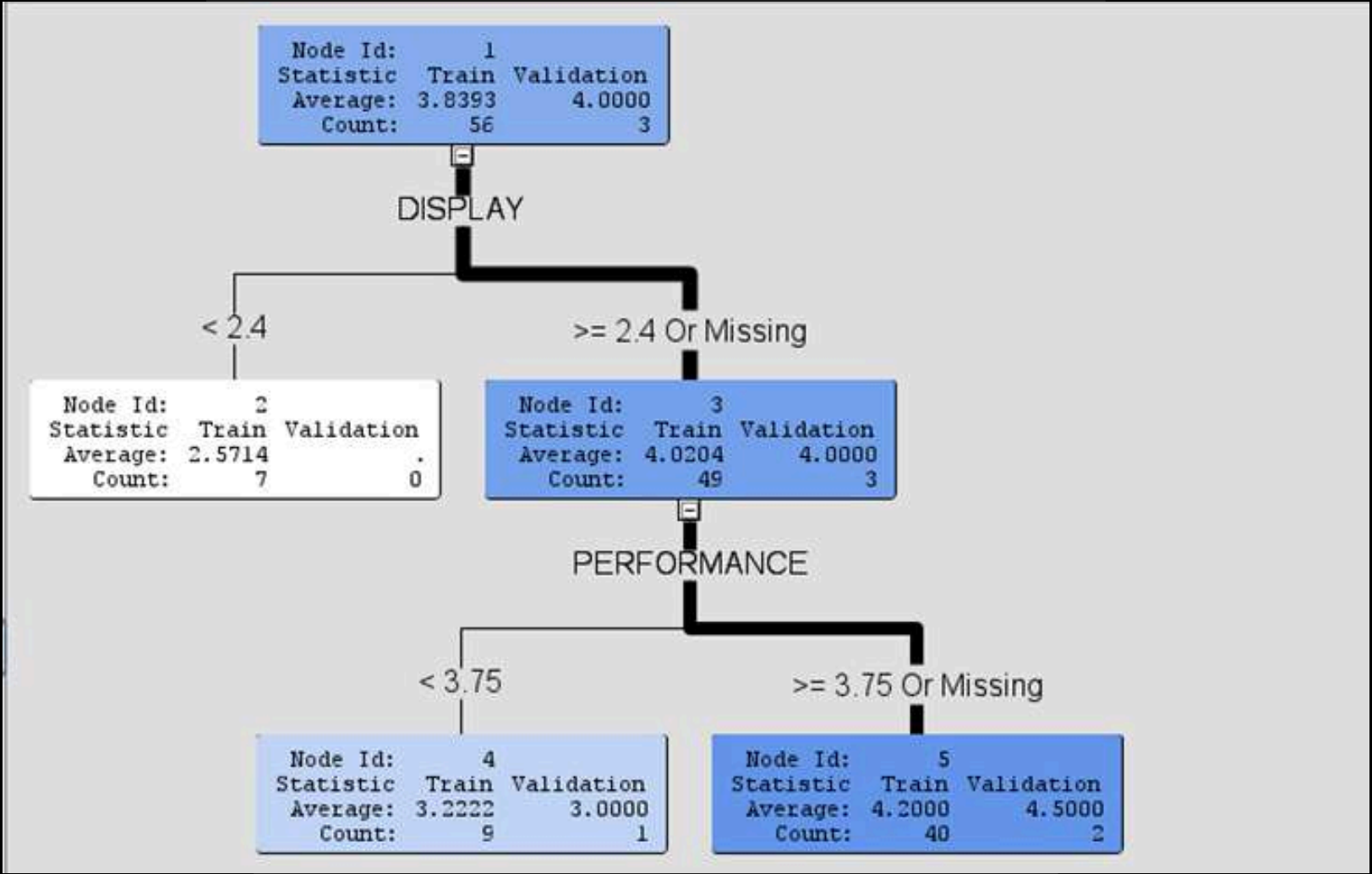
- Found that DISPLAY has significant effect on Price of the laptop.
- Odd ratio estimate is 9.005, one unit increase in performance will increase quality by 9X

# DECISION TREE

(QUALITY)



(PRICE)



# RECOMMENDATIONS

...

## PERFORMANCE

Prioritize performance improvements to cater to the multitasking needs of student users who heavily rely on their systems.

## COOLING SYSTEM & SPEED

Enhance the quality of the laptop by focusing on improving the cooling system and speed. This will ensure a smoother and more efficient performance, addressing the needs of users who prioritize quality and reliability.

## SCREEN RESOLUTION & REFRESH RATE

Improve screen resolution and refresh rate to add value without significantly increasing the laptop's price, meeting the needs of budget-conscious users.

## DISPLAY

Prioritize display quality by enhancing screen resolution and refresh rate to provide a more comfortable and visually pleasing experience for users who spend extended hours on their laptops.



# References

- (Dirgantari et al., 2024)
- (Toldos-Romero & Orozco-Gómez, 2015)
- (A Consumer Buying Behaviour towards Laptops, 2023)
- (Hanifati & Salehudin, 2021)
- (Plloçi & Koc, 2014)
- (Shah et al., 2012)
- (Pongantung et al., 2019)

# THANK YOU



Gurpreet Singh  
Sourav  
Pankaj  
Chandan Suhruth  
Abhishek Kulkarni