How Stars, Reviews, and Prices Affect Online Consumers' Decision-Making

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Introduction

Our study takes inspiration from a paper published earlier this year in March, which focuses on the relationship between textual and numerical information of reviews. The paper evaluates decisions that consumers make concerning how they compare two products, how they individually perceive products based on reviews, and how they discern between star ratings and reviews.

In a day and age where digital marketplaces and e-commerce are all the rage, the role of reviews and star ratings provided by customers has never been more important. With the plethora of products available online, consumers need accurate and reliable information more than ever, especially when they are comparing similar products that have different prices. Through this study, we aim to understand how commented reviews and star ratings affect the way people make decisions when encountering products that have similar features but different price tags.

Our hypotheses are as follows:

H1: Given two similar products, at two different prices, consumers tend to favor the cheaper option when both items have positive reviews and ratings. However, in cases where both products have a low positive review ratio, they make irrational decisions by deviating from price-based decision-making, leading to an increased preference for the more expensive option.

H2a: Given two products, at two different prices, a negative review for a higher-priced product has a greater impact on the consumer's decision, when both have similar star ratings.

H2b: Given two products, at two different prices, a star rating for a higher-priced product has a greater impact on the consumer's decision, when both have similar reviews.

Comprehending the dynamics of how star ratings and negative reviews affect consumer decisions has real-world consequences for consumers, retailers, and marketers. The results of this study may provide us with much-needed insight into how we can formulate effective marketing strategies and help businesses leverage online reviews to positively impact consumer behavior.

Methodology

Experiment Design:

The experiment was built using the Psychopy software and was conducted on our personal laptops. There were 31 participants with the demographic being college undergraduate students from IIIT-H ranging from ages 19 to 22. Subjects participated voluntarily and there was no coercion or incentive provided to make people participate.

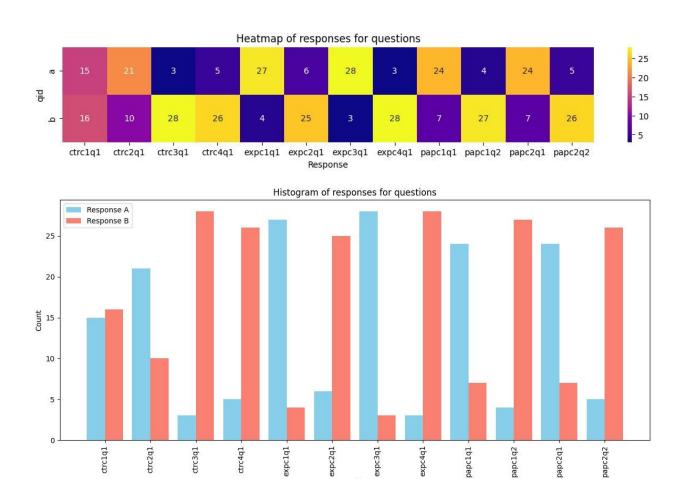
The experiment consisted of a series of 12 tasks provided to each participant in a random order. At the beginning of the experiment, participants were told to assume they had Rs 2 lakh and were told they needed to purchase a new laptop for their college education. They were then instructed to choose between two provided laptops (laptop A and laptop B) based on the given price, star ratings, and reviews for each laptop, given that all the laptops have the same specifications.

The participants' choices were recorded based on whether they clicked the A or B key on the keyboard, corresponding to laptop A and B respectively. Between each question, a delay of 3.2 seconds was given to the participants to attempt to prevent experimental fatigue.

The series of tasks was designed to test participant decision-making based on different parameters. Each binary choice had varied values for price, star rating (1 to 5 scale), and five different reviews either majorly positive or negative. Participants were told to assume they had a principal amount of Rs 2 lakh to mitigate any biases they might have due to their socio-economic background and to level the playing field. We fixed the products to be laptops as students are likely to have experience purchasing the same. The laptops were named Laptop A and Laptop B to not be associated with any particular brand or company and thus avoid the biases due to brand loyalty and product familiarity.

Results

We will look at the responses given by the participants to the 12 questions in this section. For simplicity, we divided the questions into 3 parts.



Figures 1 and 2: Mapping of each experimental case with which the laptop was chosen

1. Task Type 1 (Prices are the same while varying reviews and star ratings)

In the type 1 task, we followed the reference paper conditions by fixing the prices for both laptops and only changed the reviews ratio (positive to total reviews) and star rating from high to low (where 4-5 stars are considered high rated and 1-3 stars are considered as a low rating).

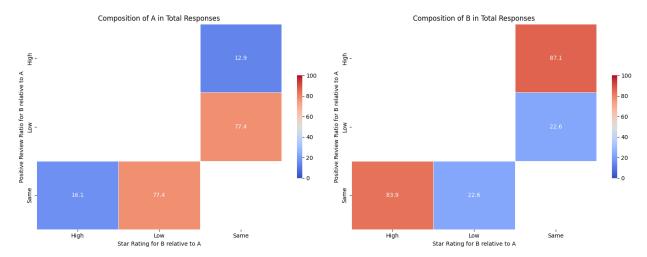


Figure 3: Results for Type 1 tasks where prices are fixed and reviews and stars.are varied.

From Figure 3 we can see that we can verify that almost all participants were choosing the options that had higher reviews or star ratings. There is not much difference in the number of people who chose an option with a higher review ratio and fixed star ratings compared to cases where they chose high star ratings with similar review ratios, as presented by the finding by Noh et al., 2023. This implies that the star rating should have more influence than reviews on the binary choice between two similarly priced products. In our experiment, we couldn't find any clear distinction for those cases based on participants' responses.

2. Task Type 2 (Varied prices for each laptop but maintained the same ratings and reviews)

In this task type, we had 4 questions wherein each question the price for the laptops was different where laptop A was higher priced than B. The star ratings and positive review ratio were kept the same.

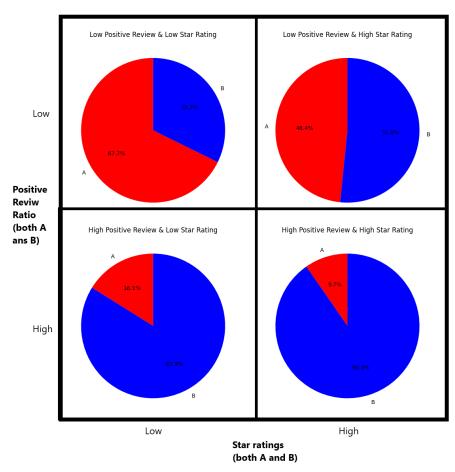


Figure 4: Results for Type 2 tasks where except for prices, all variables remained the same for all 4 questions.

From Figure 4, we can see that when the participants were presented with a high positive review ratio and high star rating they chose the least expensive product (economical option) since both had the same specifications and similar star ratings and positive review ratio.

This trend changes very little (a slight increase in people choosing the expensive option) when both were rated low (1-3 range).

There was an unexpected distribution when both products were rated high with a similar low positive review ratio, deviating from cost-based-decision making.

The distribution is even more unusual in the case where both the reviews and ratings are low, where people chose the more expensive option more often.

3. Task Type 3 (Varied prices and another variable either reviews or the ratings)

In the type 3 task, we had 4 questions wherein each of the questions the price for the laptops was different. A was priced higher than B. Along with price we also changed either the review ratio or the star rating.

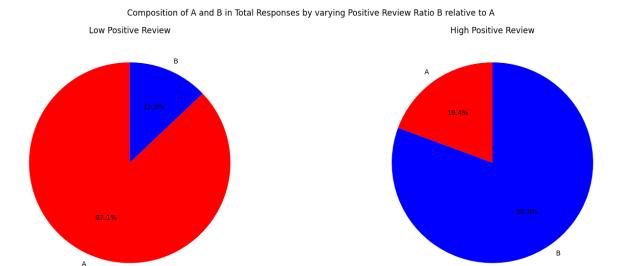


Figure 5: Results for two questions where A is priced higher than B and varied the Positive Review ratio and kept the star rating as same for both the products.

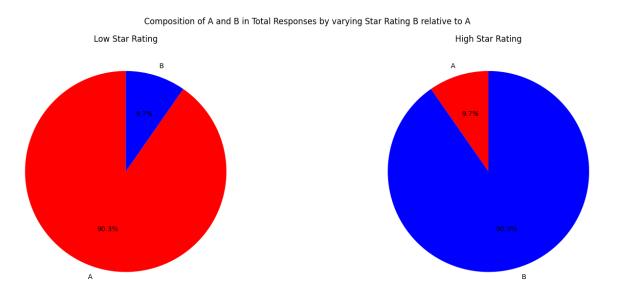


Figure 6: Results for two questions where A is priced higher than B and varied the star ratings and kept the Positive Review ratio as same for both products.

From the results in Figure 5, where both the laptops had a high positive review ratio and high star rating, a majority of the participants chose the option that had more favorable reviews and ignored the price difference between the products entirely.

From the results in Figure 6, we see participants performed similarly to the above case where they choose the option with higher ratings and ignored the prices.

If participants are now given another task where both the laptops have a low star rating, we observe that a certain percentage of participants switch from B to A. This increase in buying the expensive product can be attributed to many other factors like biases in the reviews. Hence they rely on reviews to make a proper judgment which are very subjective.

If given a task with a low positive review rating for both products, we observe that the choices that participants make almost have a 50% distribution. This could imply that participants were not able to make judgments as they were overwhelmed with low review ratings to make a proper decision based on price.

In the case where we present the participants with both laptops having bad reviews and bad ratings, we observe that the distribution of laptop A and laptop B is reversed from the case where both of them had high reviews and high ratings, which is a bad choice since they are paying more for the same product.

Discussion

Type 1: The results obtained in these tasks were in line with the inferences from the reference paper and thus we were able to validate the outcomes from that paper.

Type 2: The results obtained from this task suggest that when a product has high reviews and star ratings, it is easier for the consumer to make decisions while considering price as a primary factor. However, this trend of choosing the cheaper option is not followed when we reduce the positive review ratio. In that case, when we presented participants with 4 negative reviews and one positive review for both products they were not able to make a decision, implying negative reviews might have affected the consumers' emotions, enabling them to make the irrational decision of choosing the expensive option. This was more pronounced when both the products had bad star ratings and reviews where A was chosen more than 50% of the time. This could be attributed to how the reviews were framed.

This proves our H1 hypothesis which states that when there is an increase in negative reviews the consumer may not be able to make a rational price-based decision and might be more influenced by the reviews than the actual price of the product.

Type 3: In this case, the results show that even when the prices are different, people tend to choose the option with a higher star rating or review ratio, thus portraying the value they associate with those parameters.

H2a and H2b cannot be proven due to insufficient data as more cases and variation is required to come to a conclusion.

Limitations

Due to the limited demographic of participants being only undergraduate students from IIIT-H, the results may not be generalizable to a broader population. The unique decision-making traits of the chosen demographic may not accurately reflect the decision-making behavior of a diverse set of consumers.

Another notable limitation of the study is the omission of the socio-economic background of participants as a significant variable. We see that participants' spending habits and their perception of the value a product holds, are impacted by their socio-economic status. The failure to take this variable into account could also affect how well our results could be applied to a larger demographic. Future studies should include the socio-economic status of the participants to guarantee a more accurate representation of how decision-making works in the provided scenario.

Our study did not also delve into the cognitive and affective aspects of decision-making. Future research could investigate how things like cognitive biases, emotions, and different ways of processing information, can have an effect on decision-making and consumer purchasing behavior.

Our scope was narrow and exhaustive for some cases since we had 12 questions in total for every participant. A comprehensive study with varying prices, reviews, and ratings may require hours of participants' time and could be accomplished by future researchers in this area.

Our budget was 2 lakhs INR which is quite excessive, considering the options we presented the participants with. We did not know what the threshold difference was for a specific person to result in a change in their decision-making, hence we made the budget relatively wide enough to see variations.

Literature Review

In a study conducted by Lee, Park, and Han (2008) for 248 Korean college students, to investigate how the quality and caliber of negative online reviews can influence consumer behavior, it was found that a high percentage of negative reviews led to a conformity effect where consumers tended to conform their opinions and decisions to the types of reviews they read. Moreover, they discovered that higher-quality negative reviews had a greater impact on consumers. Their study provides useful insights and illustrates how the quality of reviews and the extent of consumer involvement shape the perception of customers.

The increased significance of online product review forums and the requirement for metrics and models to utilize the provided information for decision-making are discussed in a paper by

Dellarocas, Zhang, and Awad (2007). This study adds to our knowledge of how online product reviews influence customer behavior and highlights their importance for sales forecasting. It also provides useful insights into decision-making and marketing tactics in the entertainment sector.

Chen's research (2017) explores the critical analysis of several rating systems - binary-visual, binary-textual, and five-star. He investigates the impact of these rating systems on users' purchasing habits. The study examines the affective aspect by demonstrating that five-star rating systems, regardless of the given task, tend to elicit a sense of enjoyment amongst users.

Tsao (2014) explores how customer and critic reviews affect the decisions and behavior of moviegoers. Using factorial design, it investigates how various review formats and customer expectations impact how people assess films. According to the survey, prospective moviegoers are more influenced by the reviews of customers than critics who have watched the movie. The study highlights the role that online reviews have in influencing the choices moviegoers make. It stresses the need to promote positive customer reviews and minimize unfavorable ones.

Blažević et al. (2013) present a thorough model of customer-driven influence (CDI) that emphasizes the importance of customer-to-customer interactions. The study develops a complete model of customer-driven influence by combining existing literature on word-of-mouth, social influence, and dual processing of information. It tackles basic self-regulatory problems such as the effect of implicit goal activation and crucial contextual factors on preference development and choice.

Conclusion

The findings obtained by our study are in line with the referenced paper and thus highlight the relation between how price, reviews, and star ratings influence the decisions we make. We were able to conclude that consumers favor cheaper options when provided with positive reviews and ratings, but choose the expensive option when they are presented with two products that have lower overall reviews. Looking at the broader implications of this research, it becomes evident that the digital marketplace is an area of consumerism where the consumer's decision-making is influenced by a variety of factors. Our findings underscore the impact that these factors have on perception and emphasize the necessity of businesses to manage their online reputation to entice consumers to purchase their products.

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Appendix

CONSENT FORM

Consent Form:

I hereby agree to participate in the research study described above. I understand the general purpose of the experiment, and I am aware that my participation is voluntary.

I acknowledge that:

I have been provided with information about the experiment's procedures.

I understand that the data collected during the experiment will be kept confidential and used solely for research purposes. I am free to withdraw from the experiment at any time without providing a reason.

I agree to participate in the experiment and provide my responses as accurately and honestly as possible.

Press the space bar if you consent to participate.

INSTRUCTIONS SCREEN

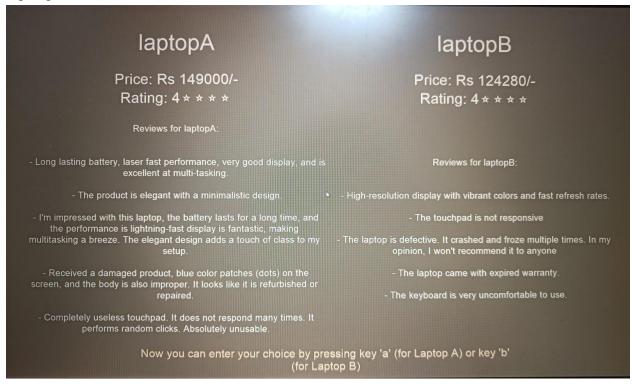
Suppose you have Rs 2 lakh. You need to choose a laptop to buy for your college education. You will be presented with information about two products with certain star ratings, reviews, and prices.

Choose option A or B based on which laptop you are more likely to purchase based on the given information.

Assume all the laptops provided to you have the same specifications.

QUESTION IDs WITH CORRESPONDING QUESTION

expc1q1:



IaptopA

Price: Rs 99999/-Rating: 4 * * * *

laptopB

Price: Rs 71999/-Rating: 4 * * *

Reviews for laptopB:

Reviews for laptopA:

- Cheap plastic construction that feels like it might break any moment
 - Responsive touchoad and smooth scrolling
 - Sluggish performance for multitasking or resource-intensive applications
 - Lackluster audio quality
 - Display quality could be better; colors appear washed out
- Great display, fast performance, and great gaming experience, also good for coding and other software development work.
- The biggest drawback is the trackpad, when I use it the mouse is moved automatically. It was the most irritating part of this laptop, I thought it might be a software glitch but it is not getting solved. I'm not sure how to get out of this issue.
 - Its specs meet my bare minimum requirements at the best price.
 - This is an allrounder for coding and gaming. Go for this laptop.
- So far so good, been using this for the last 6-7 days. I've done heavy gaming and it does heat a bit but the thermals of this laptop are quite good. The fans are really good and don't make much noise. It can run all of your heavy games at max or close to max settings.

IaptopA

Price: Rs 71000/-Rating: 4.2 * * * *

Reviews for laptopA

- Robust performance; handles resource-intensive tasks effortlessly.
 - Subpar battery life; requires constant access to powe
 - Incredible Retina display; colors are accurate, and details are stunning.
- Impressive audio quality; great for media consumption and contence creation.
 - Comfortable keyboard with a satisfying tactile feel.

IaptopB

Price: Rs 64052/-Rating: 3.4 * * *

Reviews for laptopB:

- Incredibly lightweight for a laptop; great for travel.
- Underwhelming performance; struggles with basic tasks
 - Good enough battery life.
- The stunning display provides a spacious and detailed workspace.
- Sleek and minimalist design; a gaming laptop that doesn't scream 'gamer'

Now you can enter your choice by pressing key 'a' (for Laptop A) or key 'b' (for Laptop B)

expc4q1

laptopA

Price: Rs 150412/-Rating: 3.7 * * *

Reviews for laptopA

- The touchpad is smooth and easy to us
- Dim and lackluster display; colors appear muted
- Great for highly intensive and memory-demanding work.
- Responsive and comfortable keyboard for extended typing sessions
 - Ample RAM allows for seamless multitasking, running multiple applications simultaneously is a breeze.

laptopB

Price: Rs 75405/-Rating: 4.1 * * * *

Reviews for laptopB:

- Outdated design and build; lacks the modern aesthetics of competitors.
- Handles graphics-intensive gaming sessions and high-resolution video playback with ease.
- A true powerhouse! From gaming to spreadsheet calculations, this laptop excels in productivity tasks.
- Quick response times; the laptop doesn't lag, even with several browser tabs open and resource-intensive apps running
 - Good laptop for all kinds of tasks.

IaptopA

Price: Rs 121095/-Rating: 4 * * *

Reviews for laptopA:

- Webcam, speakers, and trackpad are bad. Don't buy unless you have money to buy peripherals.
 - Best laptop for gaming while also being not too bulky
 - Very bad design and plastic build not good and heavy
- Great value for money. It has all I need as a CS student with good performance.
- It's a great laptop. Boot in less than 10 sec. Windows 11 supported. I
 have purchased for it my office work. It is working fine.

IaptopB

Price: Rs 107999/-Rating: 4 * * *

Reviews for laptopB:

- High definition and high refresh rate perfect for gaming and only laptop to offer it at this price
- Don't buy this laptop at this price, it's a ripoff much better options are available not worth it.
 - The screen was not smooth it was flickering; it might be a manufacturing defect but still has not been replaced.
 - Good for gaming and development tasks
- The best laptop for the given price and a similar specs device at this price are very rare.

Now you can enter your choice by pressing key 'a' (for Laptop A) or key 'b' (for Laptop B)

ctrc2q1

IaptopA

Price: Rs 89854/-Rating: 3.2 * * *

Reviews for laptopA

- The laptop is nice and budget friendly
- erformance issue not able to handle software for developmer
- The cheap plastic build is easily scratched and the fingerprint magnet looks old just after months of use
- Cheap plastic and a sluggish CPU are not worth it, not bad for daily use but still a much better option with a little higher price
- Very bad screen doesn't look that good. It is slow and not worth it

IaptopB

Price: Rs 65890/-Rating: 3.2 * * *

Reviews for laptopB:

- Good screen and speaker. It has a little low battery life and performance but best deal at this price
- Very bad, Cannot type on it properly and cannot be used as it has a very old gen CPU and hence returned it back.
- Waste of money. Don't buy. Very bad performance and is not useable at all
- The build is not rigid. It's very bad and has a lot of flexing, The plastic is showing cracks already. Bought it 1 year ago for multimedia purposes but the speakers are loud but not clear, and the music sounds like noise. The screen is good for watching movies but can't do anything else.
- I bought it for multimedia purposes but it has been disappointing in all features

ctrc3q1

laptopA

Price: Rs 91400/-Rating: 4.5 * * * *

Reviews for laptopA

- Battery life is bad not even 2 hours on battery needs to be plugged into the wall constantly to give decent performance.
- Nice design and RGB perfect for gaming; high performance and good refresh rate
- It has decent speakers and a trackpad bonus for a very good gaming laptop with high specs
- The display has a high refresh rate but viewing angles are less and not color accurate good bad for outdoor use; but good for gaming
- Nice performance able to handle challenging games at max settings

laptopB

Price: Rs 82989/-Rating: 4.5 * * *

Reviews for laptopB:

- The processing power of this device is seriously impressive. It is able to do heavy-duty tasks effortlessly
- Battery life is fantastic, lasting through long workdays or streaming sessions without needing a recharge.
- Graphics performance is good; perfect for both gamers and professionals.
- Sturdy build quality gives a sense of reliability; it feels like it can withstand everyday wear and tear.
- My unit, maybe not for everyone, tends to heat up quite a bit during intense use, which can be uncomfortable and concerning.

Now you can enter your choice by pressing key 'a' (for Laptop A) or key 'b'
(for Laptop B)

ctrc4q1

laptopA

Price: Rs 91400/-Rating: 3.2 * * *

Reviews for laptopA:

- Nice design with colorful lights, perfect for gaming.
- The display lacks accuracy and angles are not good for use outside
- Battery life is really poor, barely lasting 2 hours without being plugged in.
- Display great for gaming but not ideal for outdoors due to limited angles.
 - Handles tough games smoothly with top-notch performance.

laptopB

Price: Rs 82000/-Rating: 3.2 * * *

Reviews for laptopB:

- Impressive processing power effortlessly tackles heavy tasks.
- The unit's tendency to heat up during intense tasks could be uncomfortable for some users.
 - Reliable build quality feels sturdy and durable.
- Battery life is fantastic for work but tends to heat up during heavy use, which might concern some users.
 - Good graphics performance, suitable for both gamers and professionals.

laptopA

Price: Rs 150000/-Rating: 4 * * *

Reviews for laptopA:

- Good purchase for this price
- The audio quality is very bad, can barely hear from the speakers
 - Commendable battery life
 - Bulky and heavy; not practical for on-the-go use
 - Bought this for my son, he thinks it's great

laptopB

Price: Rs 150000/-Rating: 4 * * *

Reviews for laptopB:

- Random freezes and crashes make using this laptop a nightmare. It's as if it has a mind of its own, deciding when it's time to stop working
- Large storage capacity ensures all files and projects can be kept on the laptop for quick access.
 - I love its minimalistic and sleek design
- Out of the box, this laptop is drowning in bloatware. It's like a digital obstacle course trying to remove all the unnecessary apps and tools
- This laptop is painfully slow! Simple tasks like opening a web browser or file explorer take forever. It's like watching paint dry.

Now you can enter your choice by pressing key 'a' (for Laptop A) or key 'b'
(for Laptop B)

papc1q2

laptopA

Price: Rs 75000/-Rating: 4 * * * *

Reviews for laptopA:

- Lightweight and portable, making it an ideal travel companion for both work and leisure
- Why does this laptop only have one USB port? Seriously? It's 2023 and I have to choose between charging my device or connecting a peripheral. Unbelievable.
- No USB-C port in this day and age? It's like they are intentionally trying to make this laptop outdated. Connectivity options are stuck in the past
- The display is a letdown; colors are washed out, and the viewing angles are terrible. Watching videos or working on this laptop is a visually unpleasant experience
- The speakers are a joke. The sound is tinny and lacks any depth. Even at max volume, it feels like you're listening through a cheap

laptopB

Price: Rs 75000/-Rating: 4 * * * *

Reviews for laptopB:

- Speedy performance. Never lets me down
- The battery on this thing is a joke. You can forget about working remotely or taking it on a long flight without a charger
 - The sound quality on this laptop is top-notch.
- The display is great. The colors are vibrant, and the high resolution ensures sharp details. Watching movies or editing photos is an absolute delight.
 - The laptop's sleek aluminium body exudes sophistication. It feels robust and well-built, making every interaction a pleasure

papc2q1

laptopA

Price: Rs 69000/-Rating: 4.2 * * * *

Reviews for laptopA:

- Has great sound quality
- Lightweight and looks great
- The quick charging feature is a game-changer. A short charging session provides a significant boost, ensuring I spend more time using the laptop than waiting for it to charge
- A great selection of ports, including USB-C, HDMI, and an SD card slot.
- The colors on the display look washed out and pale in comparison to other laptops

laptopB

Price: Rs 69000/-Rating: 3.4 * * *

Reviews for laptopB:

- Lack of USB ports.
- Good produc
- Its aluminium body makes sure it's light and portable.
 - Great sound quality.
- Have had it for 2 years now with not a single issue

Now you can enter your choice by pressing key 'a' (for Laptop A) or key 'b'
(for Laptop B)

papc2q2

laptopA

Price: Rs 84500/-Rating: 3.3 * * *

Reviews for laptopA

- Vibrant display makes consuming content enjoyable
- Bought it 2 days ago and the speakers sound very full of static
- The battery doesn't last longer than an hour with continuous use.
- The ample RAM and powerful processor make multitasking a breeze
- The laptop has a speedy performance. Applications launch in the blink of an eye, and multitasking is seamless.

IaptopB

Price: Rs 84500/-Rating: 4.3 * * * *

Reviews for laptopB:

- Bought it for my office work. No complaints till now
- The hinges creak and wobble, making me question its durability.

 Definitely not built to last.
 - Great multimedia experience; the vibrant display and powerful speakers make it perfect for streaming movies and music.
 - Perfect for students! The lightweight design, long battery life, and powerful processing make it a reliable companion for lectures, note-taking, and research.
- The design is an eyesore. It's like they took inspiration from the '90s and tried to bring it into the 21st century. The color choices and overall look are just tacky.