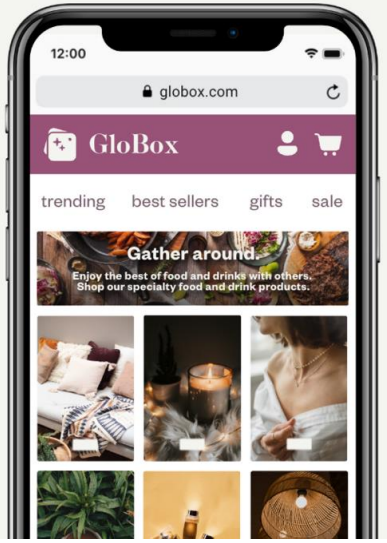
A/B Testing
Insights Gained

Group A: Control
existing landing page

Group B: Treatment
landing page with food & drink banner



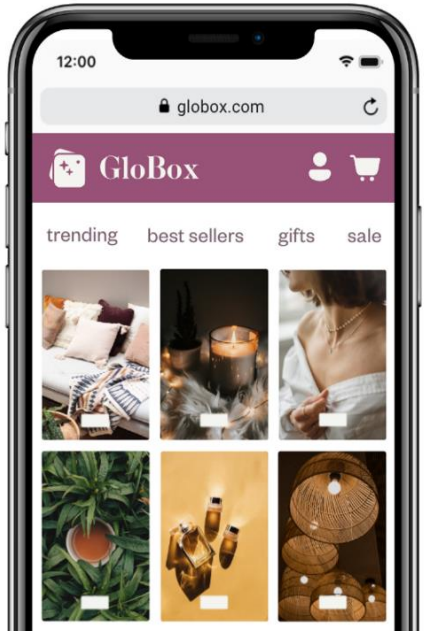
GloBox

The Growth team decides to run an A/B test that highlights key products in the food and drink category as a banner at the top of the website. The control group does not see the banner, and the test group sees it as shown:

MY ROLE: I am working as Data Analyst for Glo-box e-commerce company. My task is to analyze the results of the A/B test and provide a recommendation to the stakeholders about whether GloBox should launch the experience to all users.

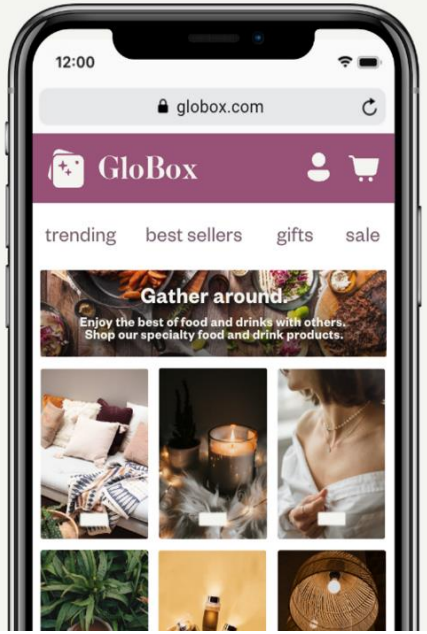
Group A: Control

existing landing page



Group B: Treatment

landing page with food & drink banner



1. CONVERSION RATE:

If they do make one or more purchases(i.e spent > 0), this is considered a “conversion”.

Conversion Rate = (Number of Conversions / Total Number of Users) * 100

Control Group: 3.92%

Treatment Group: 4.63%

While the difference is not substantial, it suggests that the food and drink banner may have a positive impact on conversion rates.
Conducting further analysis and hypothesis testing can help determine if the observed difference is statistically significant and if it can be attributed to the food and drink banner or other factors.

Formulate the Hypotheses:

Null Hypothesis (H0): There is no difference in the user conversion rate between the control and treatment groups.
Alternative Hypothesis (H1): There is a difference in the user conversion rate between the control and treatment groups.
Set the Significance Level: In this case, the significance level is 0.05, corresponding to a 5% significance level.

- p = 0.0001, statistically _significant_. We _reject_ the null hypothesis that there is no difference in the user conversion rate between the control and treatment.

	-0.438849909		=sample statistic+ margin of error		
Question 6: User conversion rate					
No. of conversions	955	1139			
Total No. of users	24343	24600			
Conversion Rate	**3.923099043**	**4.630081301**	Conversion Rate = (Number of Conversions / Total Number of Users) * 100		
Conversion Rate(in decimal)	0.03923099	0.046300813			
Standard error	0.001244334	0.001339777	Standard Error = sqrt((Conversion Rate * (1 - Conversion Rate)) / Total Number of Users)		
Question 7 and 8: 95% confidence interval for user conversion rate					
Confidence Interval (lower)	**0.036792095**	**0.04367485**	Confidence Interval = Conversion Rate ± (Critical Value * Standard Error)		
Confidence Interval (lower)	**0.041669886**	**0.048926776**			
Question 9: Hypothesis test for difference in proportion					
pooled proportion	0.042784464		(converted_usersA+converted usersB)/(sample_sizeA+sample_sizeB)	Pooled proportion (p) = (Number of conversions (control) + Number of conversions (treatment)) / (Total number of users (control) + Total number of users (treatment))	
standard error	0.001829526		Standard Error = sqrt((pooled proportion * (1 - pooled proportion)*(1/sample_size A+1/sample_sizeB)	Standard error (SE) = sqrt(p * (1 - p) * (1 / Total number of users (control) + 1 / Total number of users (treatment)))	
Z-score	3.86429177		(convertion rate B-convertion rate A)/standard error		
p value	**0.000111412**		p-value = 2 * (1 - NORM.S.DIST(3.864, TRUE))		
To conduct a hypothesis test to determine if there is a difference in the conversion rate between the two groups, we can use a two-sample two-sided z-test with a significance level of 5%.					
The null hypothesis (H0) states that there is no difference in the user conversion rate between the control and treatment groups, while the alternative hypothesis (Ha) suggests that there is a difference.					
The p-value associated with a z-score of 3.86429177 is approximately 0.000111412 (or 0.011% when expressed as a percentage). This value is less than the significance level of 0.05 (5%).					
Therefore, the correct answer is:					
B) p = 0.0001, statistically significant. We reject the null hypothesis that there is no difference in the user conversion rate between the control and treatment.					
The p-value of 0.000111412 provides strong evidence to suggest that there is a significant difference in the conversion rate between the control and treatment groups. Therefore, we reject the null hypothesis and conclude that there is a statistically significant difference in the user conversion rate between the two groups.					
Question 10: Confidence Interval for difference in proportion					

Hypothesis Testing

Yes , its effective

1st INSIGHT GAINED:

- The treatment group, which saw the banner, exhibited a significantly higher conversion rate compared to the control group. This suggests that the food and drink banner was effective in influencing users to convert and engage with the offerings in that category.

2. AVERAGE AMOUNT SPENT PER USER

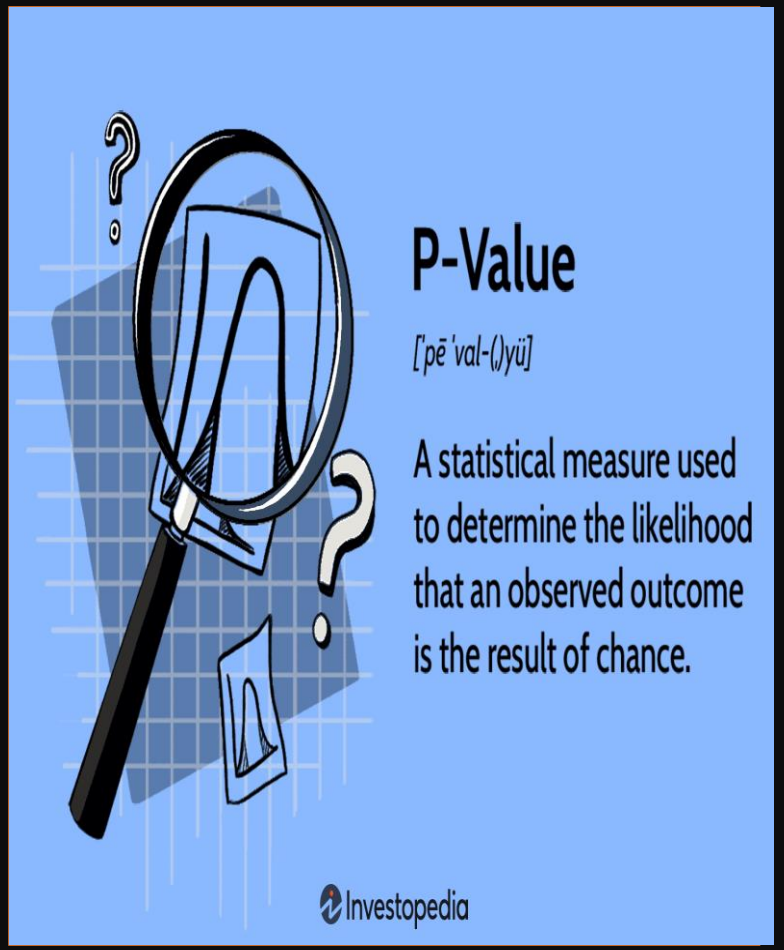
Conduct a hypothesis test to see whether there is a difference in the average amount spent per user between the two groups.

Formulate the Hypotheses:

Null Hypothesis (H0): There is no difference in the mean amount spent per user between the control and treatment groups.
Alternative Hypothesis (H1): There is a difference in the mean amount spent per user between the control and treatment groups.
Set the Significance Level: In this case, the significance level is 0.05, corresponding to a 5% significance level.

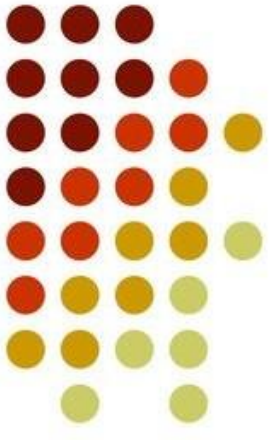
p = 0.944, statistically insignificant. We fail to reject the null hypothesis that there is no difference in the mean amount spent per user between the control and treatment.

With a p-value of 0.944, which is greater than the significance level of 0.05, the resulting conclusion is that the difference in the average amount spent per user between the control and treatment groups is statistically insignificant. Therefore, we fail to reject the null hypothesis. This suggests that there is no significant difference in the mean amount spent per user between the two groups based on the data obtained during the A/B test.Top of Form



Question 2 and 3: CI for each group			
Standard deviation	25.93639056	25.4141096	
Count/sample size	24343	24600	
Standard error	0.166235008	0.162034445	= stdev/SQRT(sample size)
degree of freedom	24342	24599	=sample size-1
T Critical value	1.960061445	1.960060427	=T.INV.2T(0.05, degrees of freedom)
The Margin of Error	0.325830829	0.317597303	=T critical value * Standard Error
Confidence Intervals(lower)	**3.048687639**	**3.073269643**	=mean - margin of error
Confidence Intervals(lower)	**3.700349297**	**3.708464249**	=mean+ margin of error
Question 4: p-value			
Null hypothesis: whether there is a difference in the average amount spent per user between the two groups.			
Significance level: 5%	0.05		
p-value	**0.943855753**		=T.TEST(range1, range2, tails, type)
If the p-value is greater than or equal to the significance level, you fail to reject the null hypothesis.			
Option D: p = 0.944, statistically insignificant. We fail to reject the null hypothesis that there is no difference in the mean amount spent per user between the control and treatment.			
Question 5: CI for Diff of Means(treatment-control) with t distribution			
Sample statistic	0.016348478		=treatment mean - control mean
Standard deviation	25.93639056	25.4141096	
Count/sample size	24343	24600	
Standard Error	0.232140559		SE = sqrt(s1^2 / n1 + s2^2 / n2)
degree of freedom(for all users)	48942		
T Critical value	-1.960012457		=T.INV(0.05, degrees of freedom)
The Margin of Error	-0.454998387		=T critical value * Standard Error

Hypothesis Testing



No , its not effective

2nd INSIGHT GAINED:

- This implies that the treatment, whatever it may be, did not have a noticeable effect on the amount spent per user.

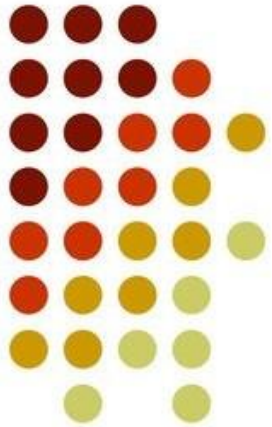
3. CONFIDENCE INTERVALS

The resulting confidence interval for the average amount spent per user in the control group is (3.049, 3.700). The resulting confidence interval for the average amount spent per user in the treatment group is (3.073, 3.708).

Overlapping intervals: The confidence intervals for the average amount spent per user in the control group (3.049, 3.700) and the treatment group (3.073, 3.708) overlap. This indicates that there is no statistically significant difference in the average amount spent per user between the control and treatment groups.

Similar range: The range of the confidence intervals is quite close in both groups. The lower bounds (3.049 and 3.073) and the upper bounds (3.700 and 3.708) are relatively similar. This suggests that the average amount spent per user in both groups is within a similar range.

Hypothesis Testing



No , its not effective

3rd INSIGHT GAINED

- It appears that the introduction of the food and drink banner in the treatment group did not have a significant impact on the average amount spent per user compared to the control group.
- The confidence intervals overlap, indicating that the difference in spending behaviour between the two groups is not statistically significant.

OTHER METRICS

It's important to consider other factors and metrics in conjunction with the above metrics to gain a comprehensive understanding of the impact of the food and drink banner. Analyzing click-through rates, or other user engagement metrics can provide additional insights into the effectiveness of the banner in driving user behavior and revenue. For example,

1. Click-through Rate (CTR): If the food and drink banner is a clickable element, you can measure the CTR in the treatment group. A higher CTR would indicate that the banner is capturing users' attention and generating interest in the food and drink category.

2. Engagement Metrics: Consider metrics related to customer engagement with the food and drink category, such as time spent on the category page, the number of products viewed, or the number of add-to-cart actions. Higher engagement in the treatment group would suggest that the banner is effectively drawing attention to the food and drink offerings.

3. Revenue: This is the primary metric to evaluate the effectiveness of the food and drink banner. Compare the revenue generated by the control group (without the banner) with the treatment group (with the banner) to see if there is a significant difference.

Tableau Public - Mastery Project 1-A/B Testing

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- conversion_rate
- daily_Conversio...
- conversion rates
- No_of_users_in...
- users in each ...
- Total_users
- User_info

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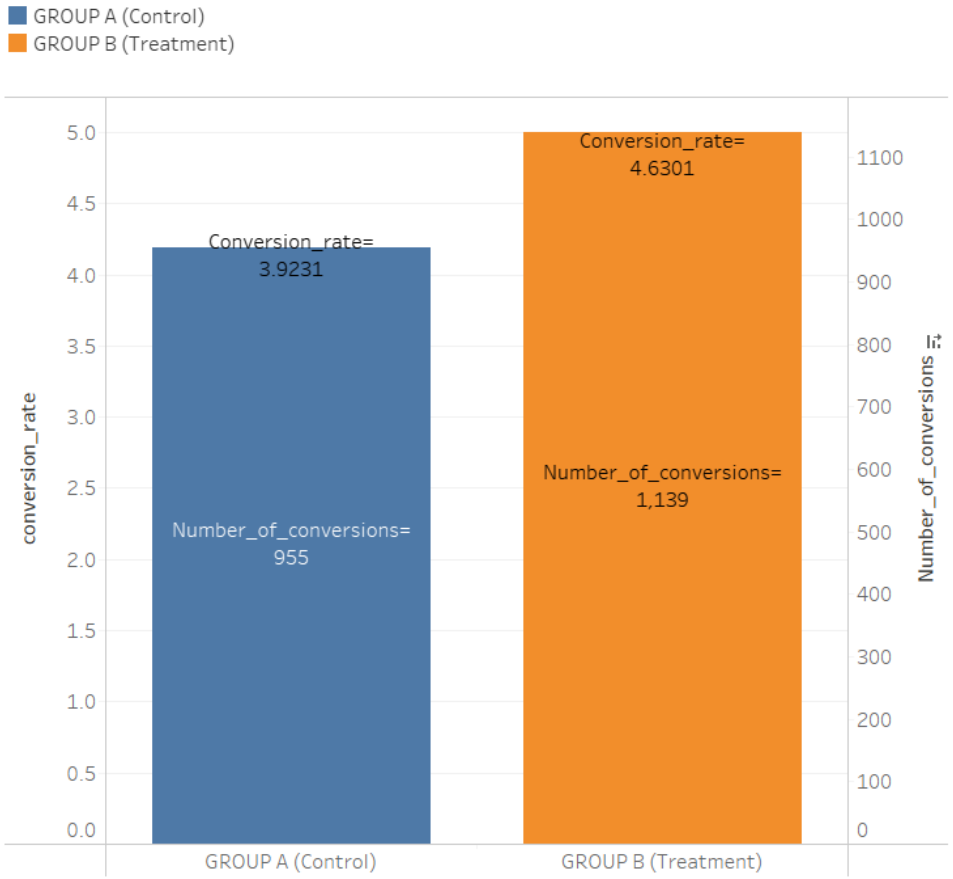
GLOBOX INSIGHTS - CONVERSION RATES



Conversion_rates