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Assignment 7 - Design an A/B Test for E-commerce Website

Instructions

1. Answer the below question in the boxes provided.
2. Please submit the assignment through TalentLabs Learning System.

Scenario

You are working as a business analyst to help using data to improve companies' e-commerce sales. You are tasked to test if changing the color of the purchase button from gray to red would help encourage people to make the final purchase decision.

You need to design an experiment and find out if changing the button to red would help the sales. This is a very common practice for the internet and tech industry. Sometimes you might find that your version of instagram might have different features or design compared to your friend. These are experiments in progress, and we call them A/B tests. The company would expose the users to the A setting and B setting, then compare how the users would react.

Tasks

1. What is the Null Hypothesis of this experiment? (1 point)

H_0 = There is no difference in sales value when changing the purchase button from gray to red

2. What is the Alternate Hypothesis of this experiment? (1 point)

H_1 = There is a difference in sales value when changing the purchase button from gray to red

3. How would you conduct this experiment on the companies' e-commerce website? (2 points)

i. Pick two group of users in random with different colors of purchase button on website ii. Record their purchasing behaviour by the end of set timeline iii. Carry out the appropriate statistical method to measure the difference between these two group of users

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iv. Conclude the result based on the p-value, whether to accept or reject H_0

4. What is the type of hypothesis test that you should be using, before you draw a conclusion? (1 point)

T-test

5. Now say we have 2 data samples collected below. Please perform the appropriate hypothesis test using the data. Can we reject the null hypothesis? (Please use significance level of 0.05)

Observation	Gray Button Group Purchase Value	Red Button Group Purchase Value
1	0	50
2	0	37
3	2	22
4	20	18
5	18	27
6	10	0

If you are using Excel or other tools to perform the test, please paste the result below. If you are doing the calculations manually, please put down your calculations below.
(4 points)

	A	B	C	D	E	F	G	H
1						t-Test: Two-Sample Assuming Equal Variances		
2								
3		Observation	Gray Button Group Purchase Value	Red Button Group Purchase Value			*Gray Button Group Purchase Value*	*Red Button Group Purchase Value*
4		1	0	50		Mean	8.333333333	25.66666667
5		2	0	37		Variance	82.26666667	290.6666667
6		3	2	22		Observations	6	6
7		4	20	18		Pooled Variance	186.4666667	
8		5	18	27		Hypothesized Mean D	0	
9		6	10	0		df	10	
10						t Stat	-2.198579188	
11						P(T<=t) one-tail	0.026283662	
12						t Critical one-tail	1.812461123	
13						P(T<=t) two-tail	0.052567325	
14						t Critical two-tail	2.228138852	
15								

Since t-test is lower than t-critical, we fail to reject null hypothesis.

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6. What are your conclusions? Would changing the button from gray to red help? (1 point)

Since we fail to reject null hypothesis, there is no difference in sales value if the purchase button changed from grey to red.