Group 12 – Case Study 4

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1. TourisTopia Travel is an online travel agency who is attempting to revise their website's homepage. The group has designed prototype homepages featuring every combination of background colors and fonts. They implemented computer code that directs each random visitor to one of the prototyped homepages. They did this for three weeks and collected the amount of time (in seconds) that the random visitor spent on the prototyped homepages. This design is known as a completely randomized design since visitors are randomly assigned to a webpage that contains a certain combination of treatments i.e. background color and font color. **Since the company manipulates the background color and font of the page to observe the effect on screen time, this is a controlled experiment.** If there were no attempt to randomly assign different prototypes then this would be an observational study.
2. Our null hypothesis is that the time spent by visitors to the Triple T website is equal for the three background colors. Mathematically speaking,

Making our alternate hypothesis that the time spent by visitors to the Triple T website is **not** equal for the three background colors. Mathematically speaking,

With F-Value = 5.749643, P-Value = 0.009248444, and confidence level = 0.05

Two-Tailed Critical Value Approach where one of the rejection rules below needs to be true for to be rejected.

Rejection Rules

5.749643 > 3.849808 = F-Upper Crit is true.

5.749643 < 0.02532518 = F-Lower Crit is false.

Reject the null hypothesis that the time spent by visitors to the Triple T website is equal for the three background colors. Therefore, we can conclude that the three background colors for the webpage do not yield the same variance in screen time.

1. Our null hypothesis is that the time spent by visitors to the Triple T website is equal for the three fonts. Mathematically speaking,

Making our alternate hypothesis that the time spent by visitors to the Triple T website is NOT equal for the three fonts. Mathematically speaking,

With F-Value= 5.318058 , P-Value= 0.01351989 , and confidence level= 0.05

Two-Tailed Critical Value Approach where one of the rejection rules below needs to be true for to be rejected.

Rejection Rules

5.318058 > 3.849808 = F-Upper Crit is true.

5.318058 < 0.02532518 = F-Lower Crit is false.

Reject the null hypothesis that the time spent by visitors to the Triple T website is equal for the three fonts. Therefore, we can conclude that the three fonts for the webpage do not yield the same variance in screen time.

1. Our null hypothesis is that the time spent by visitors to Triple T website is equal for the nine combinations of background color and font.

Mathematically speaking,

Making our alternate hypothesis that the time spent by visitors to the Triple T website is equal for the nine combinations of background color and font. Mathematically speaking,

With F-Value= 1.44441 , P-Value= 0.4538836 , and confidence level= 0.05

Two-Tailed Critical Value Approach where one of the rejection rules below needs to be true for to be rejected.

Rejection Rules

1.44441 > 3.849808 = F-Upper Crit is false.

1.44441 < 0.02532518 = F-Lower Crit is false.

We cannot reject the null hypothesis that the time spent by visitors to Triple T website is equal for the nine combinations of background color and font. Therefore, we can conclude that the nine combinations of the web page yield the same variance in screen time.

1. The results of our ANOVA testing suggest that there is enough evidence to conclude that background color and font style differ in variance in screen time spent by a user, independently. If we were to run a Chi-square test on a contingency table between the two categories there is not enough evidence to conclude that the choice of font and background color are related or influence each other in any way. The results of the Chi-square test are supported by an ANOVA test between the nine web page combinations. Since there is not enough evidence to conclude that the time spent by visitors to Triple T website are different for the nine combinations of background color and font, we cannot make any assumptions that one combination is better than another. The next steps for Triple T is to either obtain more data by conducting this experiment a repeated number of times or to perform A/B testing on different combinations to observe which combination yields the best result in screen time. In both cases, Triple T needs to acquire more data.