E-news Express

Business Statistics Project

Data Science & Business Analytics
March 2023

Contents / Agenda

- Executive Summary

- Business Problem Overview and Solution Approach

- EDA Results

- Hypotheses Tested and Results

- Appendix

Executive Summary

Conclusions:

1) The mean of the time spent on the new page is greater than the mean of the time spent on the old page.

2) The proportion of users converted to subscribers on the new page is higher than those that converted to subscribers on the old page.

3) The conversion rate to subscribers is independent of language preference.

4) The time spent on the new page is equal for all languages.

Business Recommendations:

- It is my recommendation that E-News Express move to the new landing page layout for their website.

- Visitors to the website spent more time on the new landing page and it's layout was more engaging for users.

- The new landing page had a higher conversion rate of users who turned into subscribers, language preference plays no role.

Business Problem Overview and Solution Approach

- E-News Express is an online news portal. The business wants to expand its customer base by increasing the number of subscribers to the news outlet. A new landing page has been developed to determine if it can help increase the number of subscribers to its services and increase engagement of its users.

- The Data Science team has taken a sample of 100 users. 50 people are given the old landing page, while the remaining 50 users in the sample are given a new landing page. The following statistical analysis was preformed to determine how the new landing page effected the sample.

Business Problem Overview (cont.)

The following questions will be addressed:

- Do the users spend more time on the new landing page than on the existing landing page?

- Is the conversion rate (the proportion of users who visit the landing page and get converted) for the new page greater than the conversion rate for the old page?

- Does the converted status depend on the preferred language?

- Is the time spent on the new page the same for the different language users?
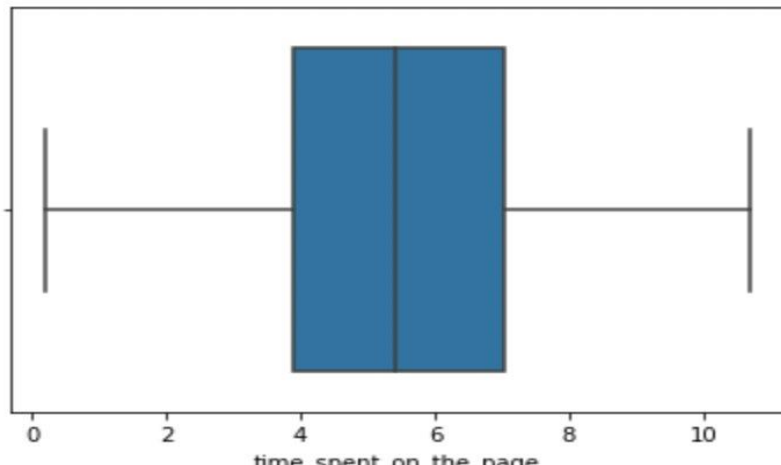
Data Overview

- There are 100 rows and 6 columns in the data set.

- There are no missing values or duplicated items.

EDA Results (Univariate analysis)
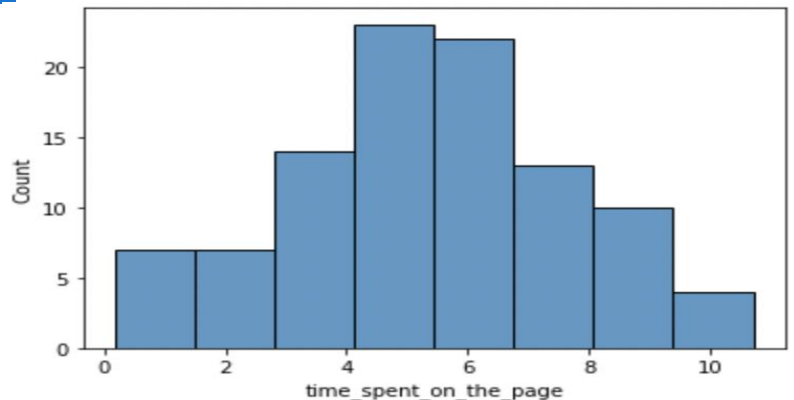
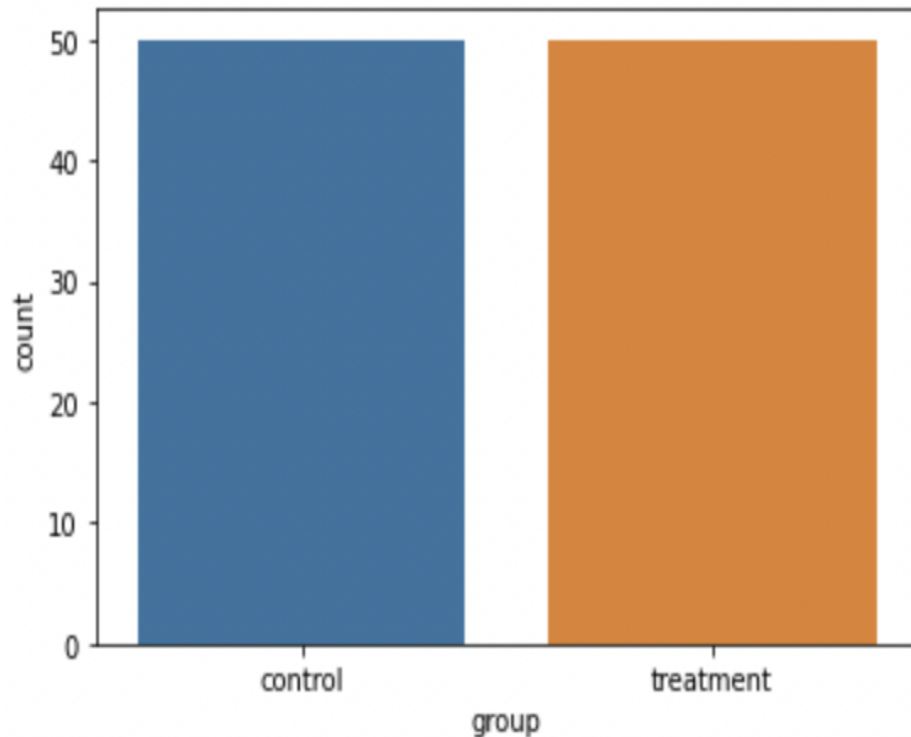The mean time spent on the page is 5.37 minutes.

The minimum time spent was 19 secs and the maximum time spent was 10.71 minutes.
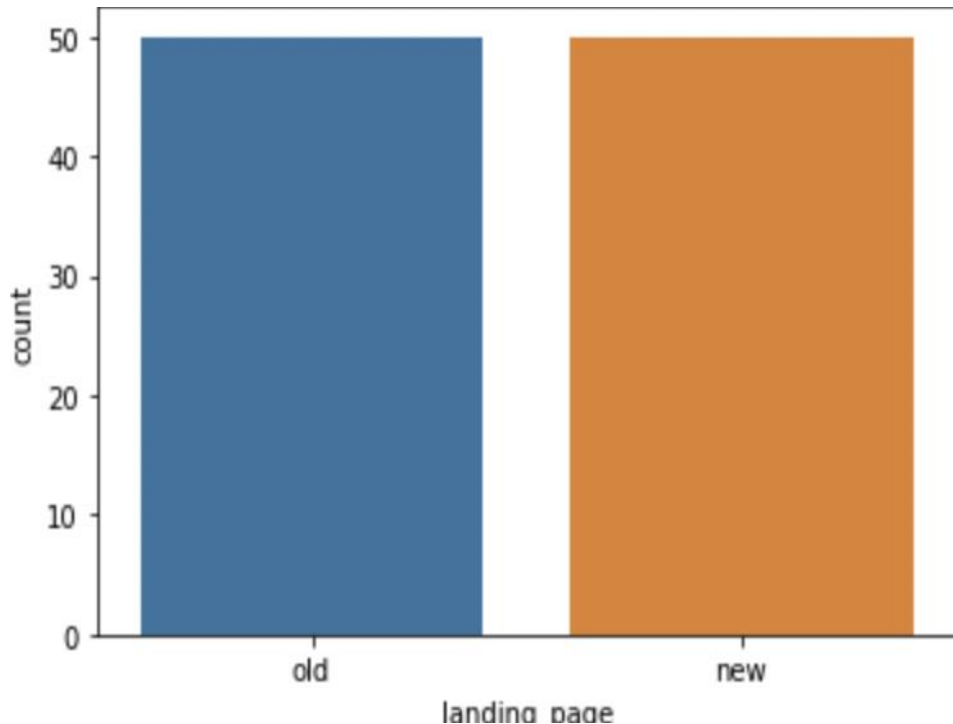
- The sample of 100 people was divided evenly with 50 people in the control   group, and 50 people in the treatment   group.
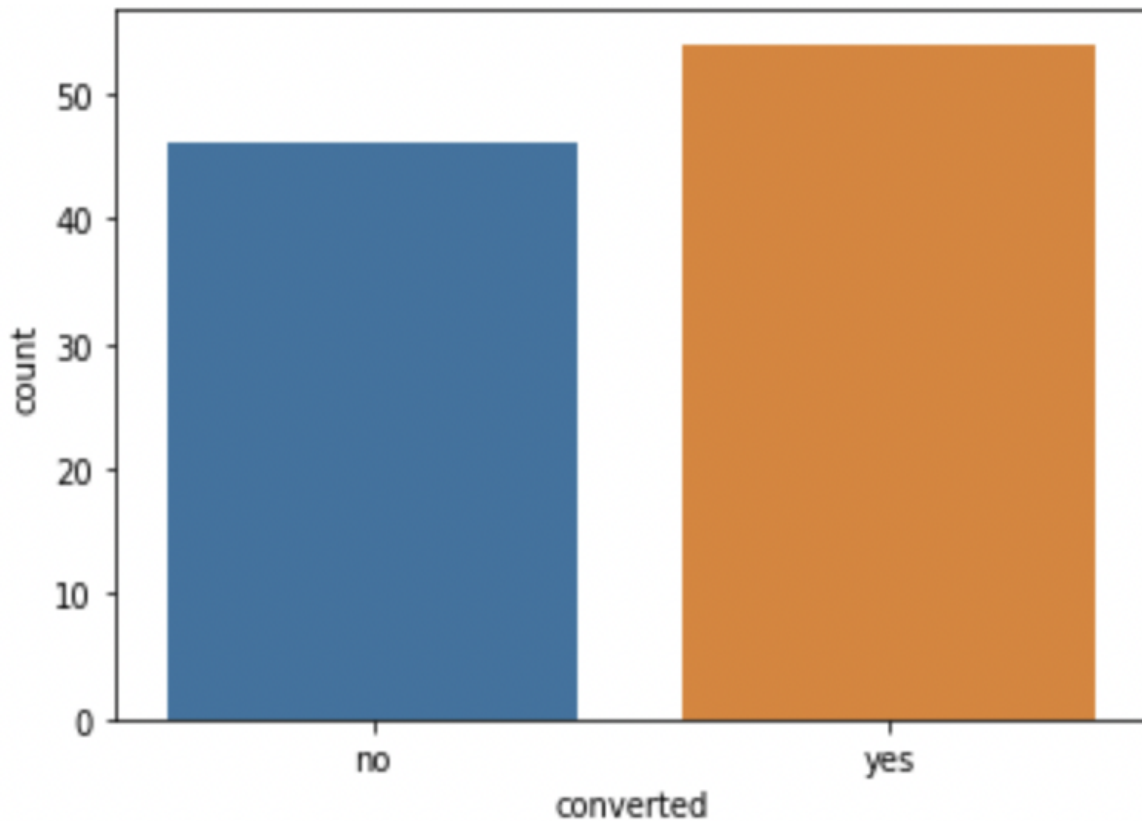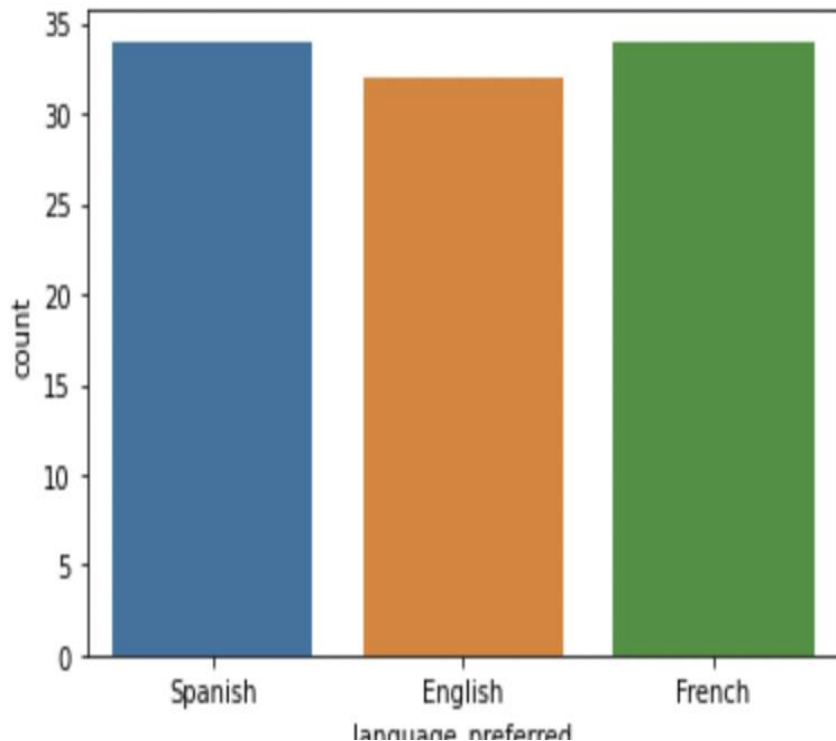
Univariate Analysis (cont.)

- Half of the sample group was given the old page as the landing page, while the other 50 individuals were given the new landing page.

Univariate analysis (cont.)

- 54 users were converted to subscribers and 46 were not.
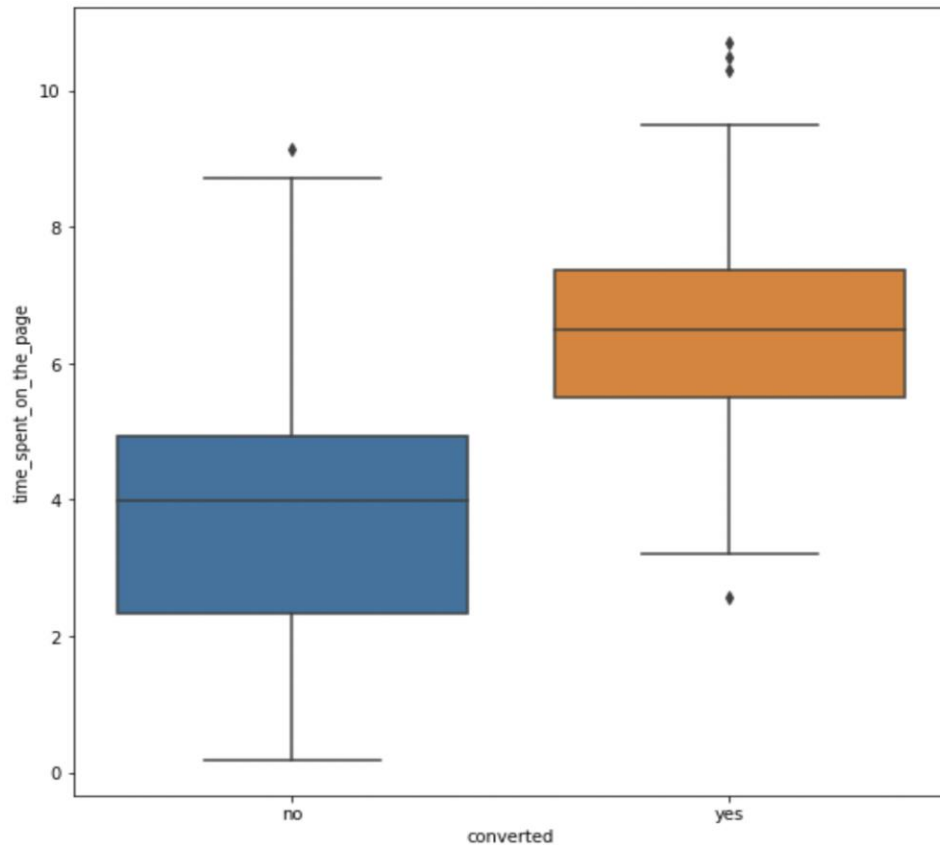
Univariate Analysis (cont.)
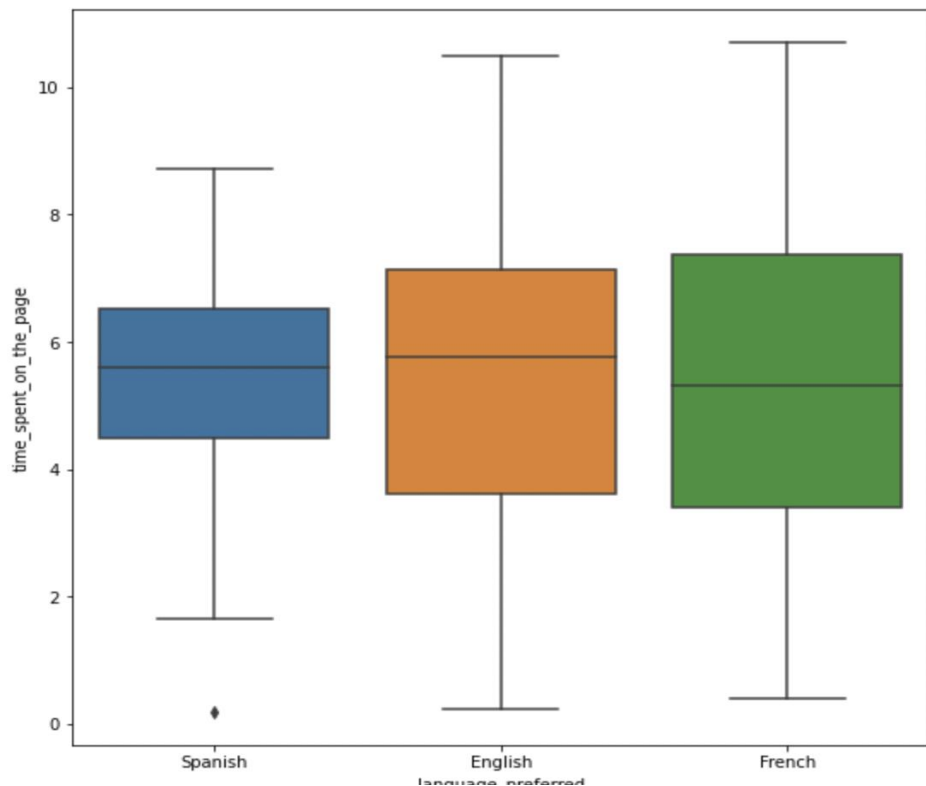

Languages preferred by users in the sample:

- Spanish 34
- French 34
- English 32

Bivariate Analysis- Conversion status vs Time spent on the page

- The longer users engaged with the page, the more users were converted to subscribers

Bivariate- Language preferred vs Time spent on the page

- Language preferred doesn't have much effect on how much time is spent on the page.

- Mean is about the same.

1. Bivariate- Landing Page vs. Time Spent on Page

- Do the users spend more time on the new landing page than the existing landing page?
- $H0$: Mean of the new page = mean of the old page
- Ha: Mean of the new page > mean of the old page
- As given in the problem statement, we select α=0.05.
- The sample standard deviation of the time spent on the new page is: 1.82 The sample standard deviation of the time spent on the new page is: 2.58
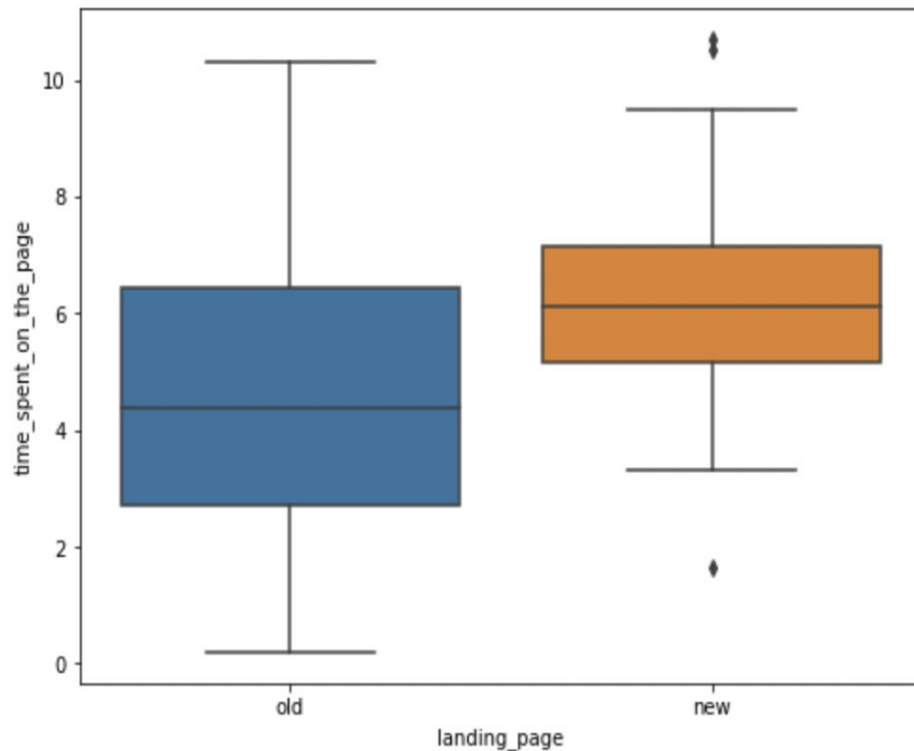
- Landing Page vs. Time Spent on Page- Inference

- After conducting a 2 sample t-test:

- The p-value is 0.000263224705619001

- As the p-value 0.000263224705619001 is less than the level of significance, we reject the null hypothesis.

- We have enough statistical evidence to say that the mean of the new page is greater than the mean of the old page.

2. Is the conversion rate (the proportion of users who visit the landing page and get converted) for the new page greater than the conversion rate for the old page?
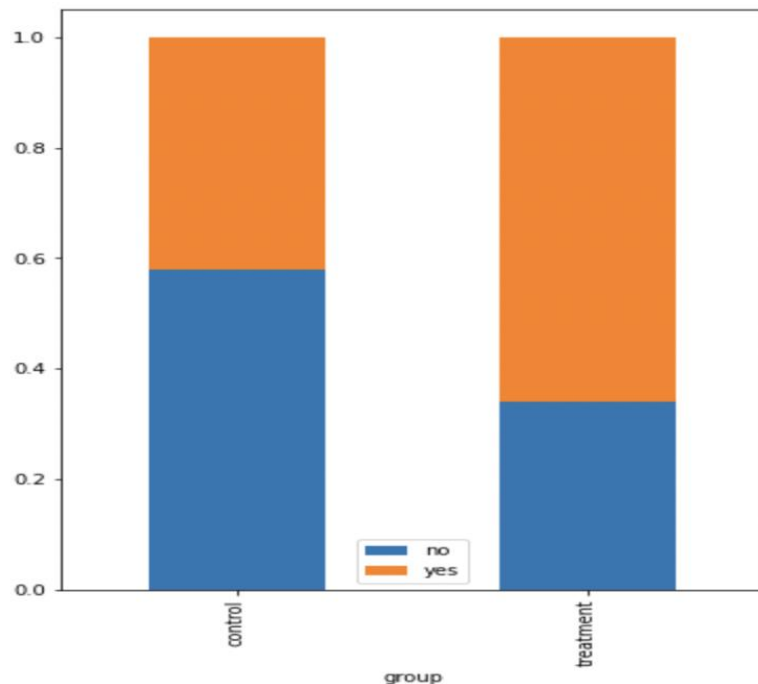
- $H0$: proportion of new page = proportion of old page
- Ha: proportion of new page > proportion of old page

- Significance level: α = 0.05.

- The numbers of users served the new and old pages are 50 and 50 respectively

- 2 proportions Z test

- The p-value is 0.008026308204056278

- As the p-value 0.008026308204056278 is less than the level of significance, we reject the null hypothesis.

We have enough statistical evidence to say that the proportion of users who visit the landing page and get converted) for the new page greater than the conversion rate for the old page.
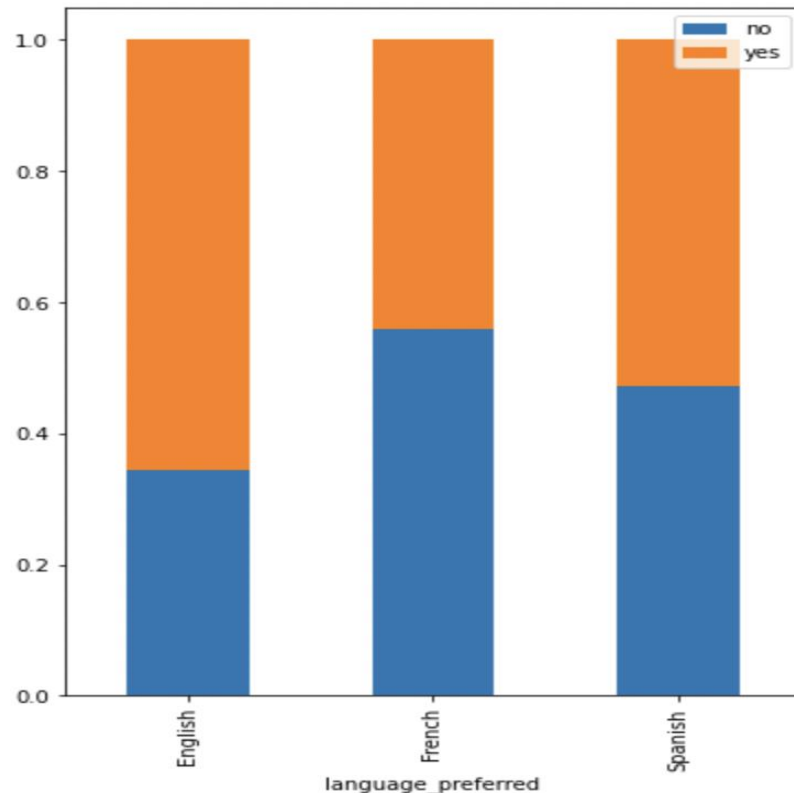
- $H0$: the conversion status is independent of preferred language.

- Ha: the conversion status depends on preferred language.

Inference #3

- Significance level: α = 0.05.

- Chi2 Contingency test

- The p-value is 0.2129888748754345

- As the p-value 0.2129888748754345 is greater than the level of significance, we fail to reject the null hypothesis.

We do not have enough statistical evidence to reject the null hypothesis, so the conversion status is independent of preferred language.

4. Is the time spent on the new page same for the different language users?
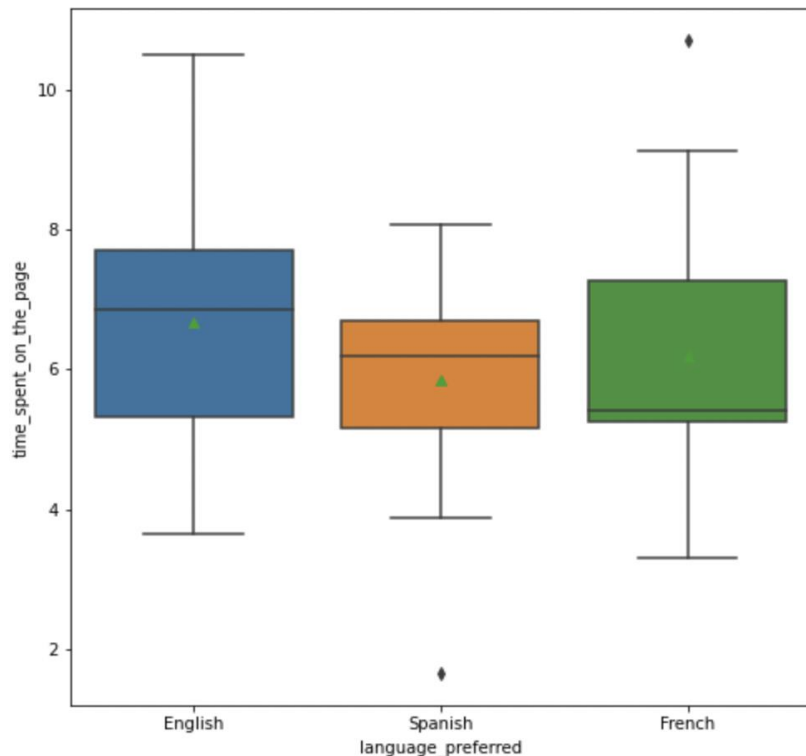
- English 6.663750

- French 6.196471

- Spanish 5.835294

- $H0$: Time spent on the new page is equal for all languages

- Ha: The time spent on the new page is not equal for all languages

Time Spent on Page vs. Language Preferred Inference

- Conducted a one-way ANOVA test

- Significance level: α = 0.05.

- The p-value is 0.43204138694325955

- As the p-value 0.43204138694325955 is greater than the level of significance, we fail to reject the null hypothesis.

The time spent on the new page was equal for all languages.

APPENDIX

Happy Learning !