

[< Return to Classroom](#)

# Analyze A/B Test Results

## REVIEW

## HISTORY

### Meets Specifications

Congratulations for passing this project, I am confident you now have a solid understanding about how A/B Testings is implemented! You have put the work in and you have made it, feel free to revisit the project, at any given time!

### Code Quality

All code cells can be run without error.

All code cells can be run without error, great job!

Docstrings, comments, and variable names enable readability of the code.

You have solved the code cells concisely and due to the nature of the exercise headers in this notebook, the limited comments and docstrings still are sufficient for effectively communicating your data analysis, however, feel free to elaborate on documentations further in general

### Statistical Analyses

All results from different analyses are correctly interpreted.

Your simulations is functional in Part II 2.(h), however very slow, and keep in mind that using for loops is computationally very expensive as this is only basic python functionality

It is always better to use specifically designed libraries which are built in low-level languages and help you write more efficient and stable code.

In this case, we better exploit numpy, which is written in C and C++ and is more than 100x faster than a standard python calculation, and further we can deploy the following method to act more efficiently:

```
p_diffs = []
new_converted_simulation = np.random.binomial(n_new, p_new, 10000)/n_new
old_converted_simulation = np.random.binomial(n_old, p_old, 10000)/n_old
p_diffs = new_converted_simulation - old_converted_simulation
```

The division by n\_new happens for each item due to underlying python functionality broadcasting, which is well explained [here](#)

Apart from this, you have diligently answered all question with precise and reasonable interpretations, great job!

For all numeric values, you should provide the correct results of the analysis.

Excellent, this is the most difficult part of the project, and you have truly done this well!

Conclusions should include not only statistical reasoning, but also practical reasoning for the situation.

You conclusion not only include presentation of statistical results, but also give logical interpretations of the findings of your analyses and elaborate on those further, great job!

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