MuscleHub A/B Test And Analysis

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Introduction

MuscleHub is a fancy gym, Managed by Ms. Janet. She thinks the fitness test visitors took as a step to buy a membership intimidates prospective visitors and so she has set up an A/B test.

Visitors who are considering buying a membership at MuscleHub have to follow the following steps.

1. Take a fitness test with a personal trainer

2. Fill out an application for the gym

3. Send in their payments for their first month's membership

Based on Janet's set up visitors will randomly be assigned to one of two groups

- Group A will be asked to take a fitness test with a personal trainer
- Group B will be asked to skip the first step and fill out the application

Janet's hypothesis is that visitors assigned to group b will be more likely to purchase a membership to MuscleHub.

This analysis, using visitors data, interviews conducted during the visits and conducting an A/B test, we will try to find out the significance of skipping the first step(taking a fitness test).

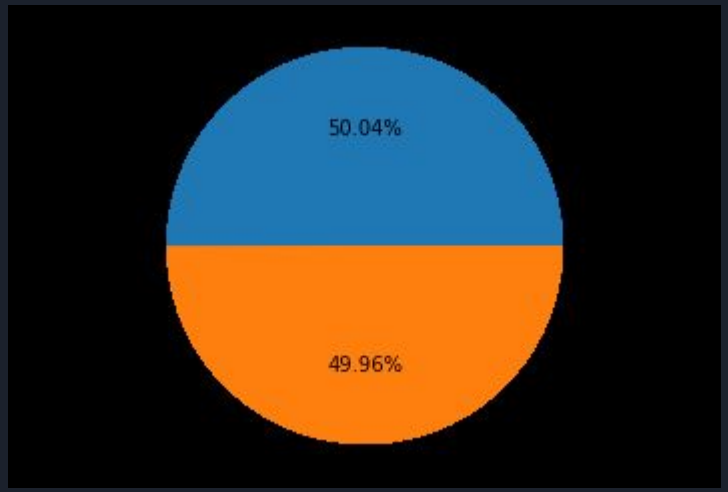
Data Overview

- MuscleHub gym manager, Janet has SQLite database.
- The data will be used by downloading it to a CSV file.
- a codecademy library which allows us to use SQL queries directly on a jupyter notebook is used to analyze our data.
- Data only important for this purpose pooled out using SQL queries and merge in one big data frame.
- The data contains information about potential gym customers who have visited MuscleHub, customers in "Group A", who were given a fitness test, customers (both "Group A" and "Group B") who filled out an application and those who purchased a membership to MuscleHub.
- Janet split visitors into two groups group A and B, the following pie chart shows the percentage of each group.

Pie chart of Group A and Group B in percent

Group A = 50.04%

Group B = 49.96%



- After grouping the visitors into two groups, knowing how many of them make it to Step2 (filling out an application) will be helpful.
- To calculate the percent of people in each group who complete an application, first, we need to count how many people from group A and group B either fill or not fill an application.
- From 2505 people in group A only 250 fill out the application and from group B 325 out of 2175 fill out the application. This shows more people from group B turned in an application.
- From group A and group B, 200 out of 250 and 250 out of 325 purchased a membership respectively.
- Based on the above result we need to check if these differences are statistically significant. To do so we need to perform a hypothesis test.

- In this A/B test where group A take a fitness test and the other group B skip the fitness test. Was one group more likely to purchase a membership?
- A Chi-Square Test is used to identify the significance of the difference.
- By importing the Function chi2_contigency from scipy.stat model we do the calculation.
- First, let's see if the difference is significant for those who take the fitness test and fill out an application.

```
occurrence =[[Group A member, Group A not member],

                [Group  B member, Group B not member]]

occurrence = [[200, 50],

                [250, 75]]

chi2_contingency(occurrence)
```

- Based on this calculation we found out the P value is rounded to 0.433, which is greater than 0.05 so the difference is not significant.
- The other situation we have is that considering the total people who visit MuscleHub gym if there is a significant difference between Group A and Group B in purchasing a membership.
- To know this, we do the same hypothesis test using Chi-Square test.

```
occurrence2 =[[Group A member, Group A not a member],
                [Group  B member, Group B not a member]]

occurrence2 = [[200, 2304],
                [250, 2250]]

chi2_contingency(occurrence2)
```

- The result shows a P-value rounded to 0.015 which shows a significant difference that between Group A and Group B.
- In addition to this analysis, an interview was conducted with MuscleHub visitors and 75 % of them find the fitness test helpful but a bit intense. 25% doesn't like it at all.

Recommendation

- Even though the difference between applicants who purchase a membership is not significant.
- Based on the results we found out there is a significant difference between the two groups when we compare the total visitors who purchase a membership. The analysis shows that people in Group B are more likely to buy a membership than people in Group A.
- Janet hypothesis was right about the fitness test intimidates some prospective members.
- So, MuscleHub gym should stop giving the fitness test for visitors who want to apply for a membership.