A/B Test for MuscleHub

Data Science Capstone Project
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1. Introduction

Project Introduction

MuscleHub Gym is a fancy, high-end gym for individual who are aiming at getting fit. The gym has a 3-stage registration process, which are:

- Take a fitness test with a personal trainer
- Fill out an application for the gym
- Send in their payment for their first month's membership

The Manager has an idea that the fitness step process might intimidate some who are just building their interests in fitness. We decided to run some test to find out if this hypothesis is statistically significant by running an AB test on 2 groups of gym visitors. Group A would follow the 3-stage registration process while Group B will skip stage 1 in the registration process. We were also interested in the funnel of each process in the application stage.

2. Project Dataset Summary

Project Dataset Summary

The dataset for this AB test was stored in four csv files. Below we have given their names and the type of data they contain.

- Visits: contains information about potential gym customers who has visited MuscleHub gym on a specific date.

- Fitness Test: contains information about potential customers in "Group A", who were given a fitness test.

- Applications: contains information about any potential customers (both Group A and Group B) who filled out an application.

- Purchases: contains information about customers who purchased a membership to MuscleHub

After examining each dataset, we joined them together into a pandas dataframe for ease of analysing.

Note:
- Not everyone in visits will have filled out an application.

- The dataframe now contains the information of all users, whether they have continued to the next stage or not. This is needed to create a funnel of the application process stages.

- Not all visits to the gym occurred during the AB test. So we are only interested in data where visit date is on or after 7-1-17, the start date of the AB test.

3. Hypothesis Testing
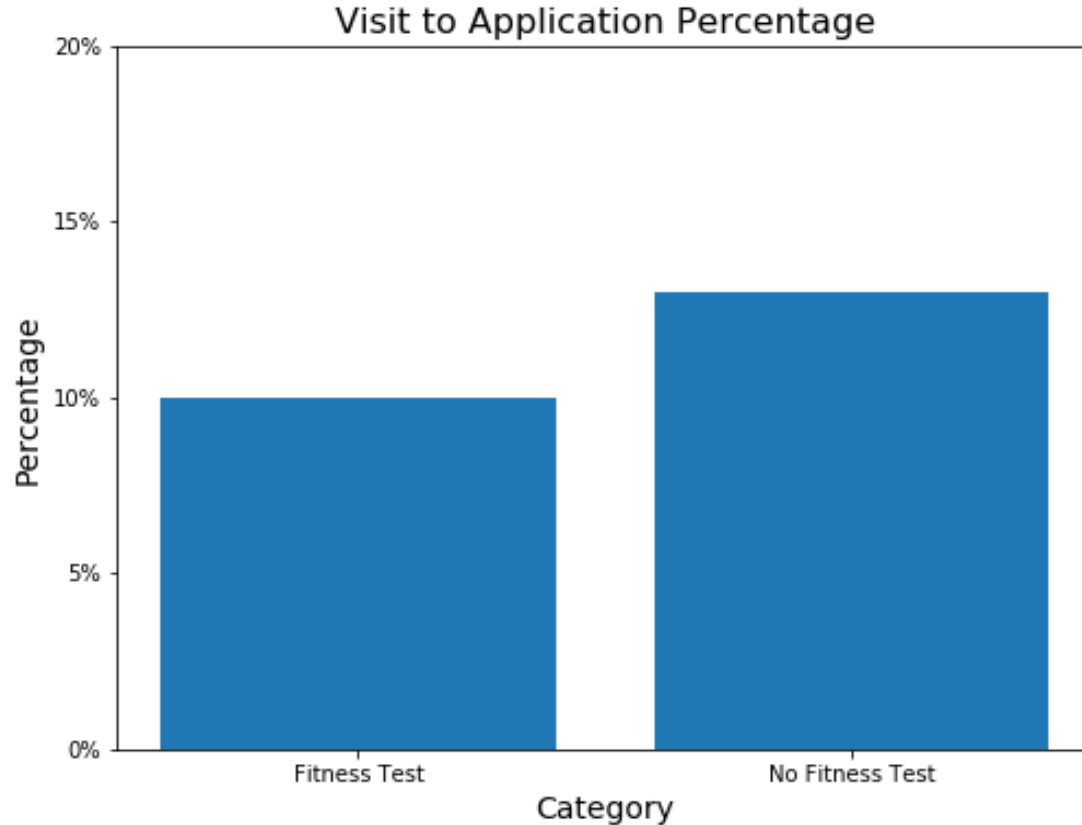
3.1 Application Form, Please?

- First, we decided to find how many customers from both groups picks up an application form? (See table below)

- Next, we calculated the percentage that number represents from the total in that group.

Group	Application	No Application	Total	Percent
A	250	2254	2504	9.98
B	325	2175	2500	13.00

- Group B has a greater percentage of picking up application.

- Is result statistically significant? What kind of statiscally test is apporpriate?

- Since this is a categorical dataset with two groups, we choose to run a binomial test to find if there is any signifcance in the result. We find that pvalue < 0.05, which indicates that there is signifcance in the result. This means that given the same number of people as in the result, more people from Group B will sign up to the gym than group A.

# Bar Chart Representation of Visit to Application process

Visit to Application Percentage

Percentage vs Category

Category	Percentage
Fitness Test	10%
No Fitness Test	13%

3.2 How would you like to pay?

▪ Next, we decided to find how many customers who filled out an application form makes a purchase? (See table below)

▪ We calculated the percentage that number represents from the total of those who picked up an application form from both groups.

Group	Member	Not Member	Total	Percent
A	200	50	250	80.00
B	250	75	325	76.92

▪ Those who took the fitness test more likely to purchase if they picked up an application form.

▪ Is result statistically significant? What kind of statiscally test is apporpriate?

▪ Since this is a categorical dataset with two groups, we choose to run a binomial test to find if there is any signifcance in the result. We find that pvalue > 0.05, which indicates that there is no signifcance in the result. This means that given customers from both groups who picked up an application form, we expect the same number from both groups to purchase a membership.

# Bar Chart Representation of Application to Member Process

Application to Member Percentage
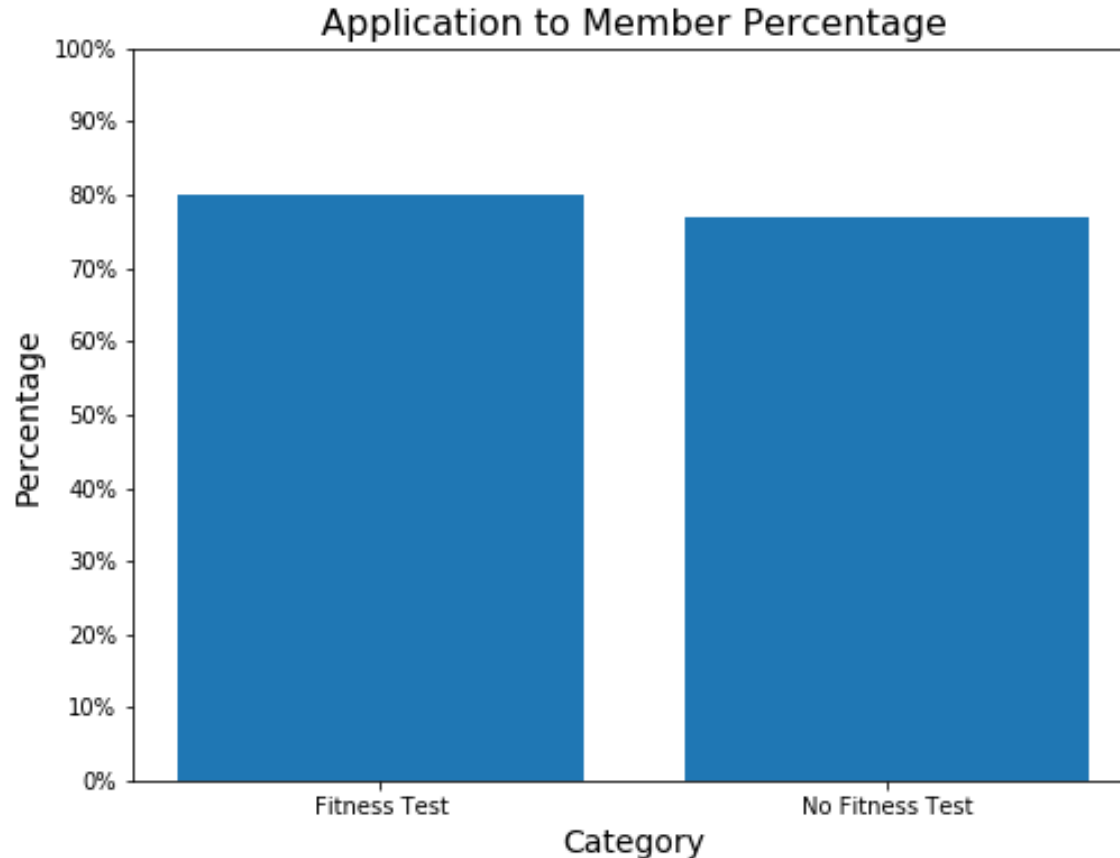
3.3 From Visit to Purchase

▪ Previously, we have looked at the percentage of those who completed the different steps in the application process, but what would really help us at MuscleHub is to see what is the percentage of people who end up purchasing a membership after visiting our gym during the AB test. We got the following results:

Group	Member	Not Member	Total	Percent
A	200	2304	2504	7.99
B	250	2250	2500	10.00

▪ Overall during this test, it seems more customers from Group B are likely to become our customer.

▪ Is result statistically significant? What kind of statiscally test is apporpriate?

▪ Since this is a categorical dataset with two groups, we choose to run a binomial test to find if there is any signifcance in the result. We find that pvalue < 0.05, which indicates that there is signifcance in the result. This means we can conclude that we expect more people to become our customers from Group B rather than from Group A.

Bar Chart Representation of Visit to Purchase Process
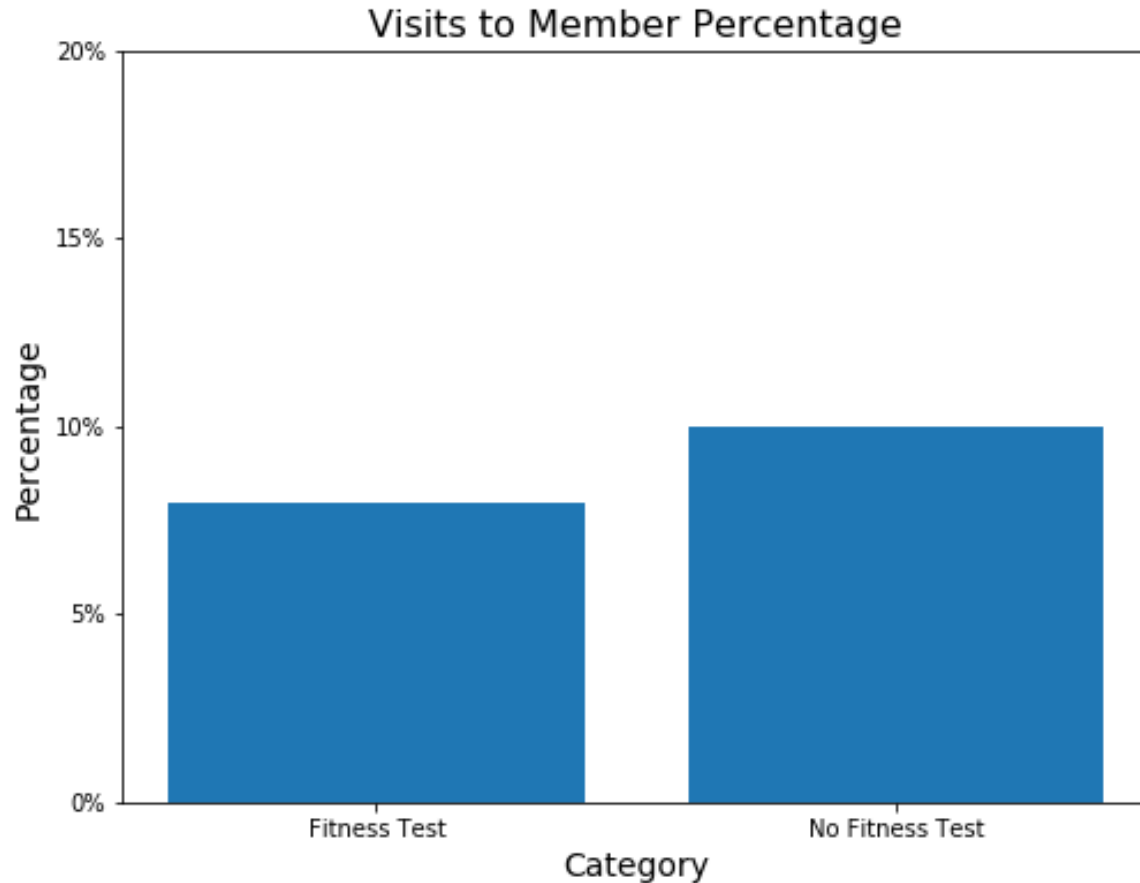
4. Summary & Recommendation

4.1 Summary

This process has helped us to understand how our visitors and customers views each stages in our application process. We also interviewed some visitors to our gym to ask about their experience during the AB test and their feedbacks gives us some great insight about our application process. Some of the insights are listed below and these will form the basis of our recommendation to MuscleHub gym:

- The fitness test was needed for some visitors to access how fit they are and the steps they can take to improve their fitness, so that their fitness journey can be personalized.

- Some visitors just want to visit the gym and go at their own personal pace rather than having a personal trainer setting up their process. They just want to test the waters and see what feels good for them.

- Some visitors took the fitness test based on recommendations.

- The ease of the whole application process.

4.1 Recommendations

Based on our analysis and the feedbacks of the visitors of the during the AB test, we are recommending the following to MuscleHub which we believes can help them increase their visitors to member process and thus increase their revenue.

- The fitness test should be made optional for visitors. While some customers wants to take the fitness test to access their level of fitness, others might not be interested and just want to go straight to the application process. The statistical test carried out also support this.

- MuscleHub can have a trial period (1 week) for visitors who are still unsure whether they want an application form or not, to see if that during the trial period they can change their mind. They can also offer those who did not pick up an application form an opportunity for a trial period.

- Depending on whether visitors takes the fitness test or not, the general application process should be made easier and stress-free, it can also be made such that it can be done without visiting the gym.