

# MuscleHub A/B Test

A study to investigate whether a fitness test intimidates prospective members

Date: 13/03/2018

# Background

Currently, when a visitor to MuscleHub is considering buying a membership, he or she follows the following steps:

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

Janet, the manager of MuscleHub, thinks that the fitness test intimidates some prospective members, so she has set up an **A/B test** to see if this was indeed the case.

Data is collected and statistical analysis is done on the results to test this hypothesis.

# The Test

In this A/B Test:

Visitors will randomly be assigned to one of two groups:

**Group A** *will still be asked to take a fitness test with a personal trainer*

**Group B** *will skip the fitness test and proceed directly to the application*

The hypothesis is that visitors assigned to Group B will be more likely to eventually purchase a membership to MuscleHub.

# The Data

The following data was collected and stored for this study:

- a. Information about potential gym customers who have visited MuscleHub.
- b. Information about potential customers in “Group A”, who were given a fitness test.
- c. Information about any potential customers (both “Group A” and “Group B”) who filled out an application. (\*Not everyone who visits will have filled out an application so this dataset only records the ones who have).
- d. Information about customers who purchased a membership to MuscleHub.

# The Method

Given the four large sets of data to customer information collected at different stages of the membership journey, the first useful task was to aggregate the four datasets into one, using the names and emails of the customer as identifier.

The complete dataset would have the following useful information on each customer for this study:

1. Whether he/she has taken a fitness test
2. Whether he/she has completed an application
3. Whether he/she has purchased a membership

Three hypothesis tests were carried out to help us analyse the data and understand if there were any statistical significance to people's behaviour.

# Type of Test

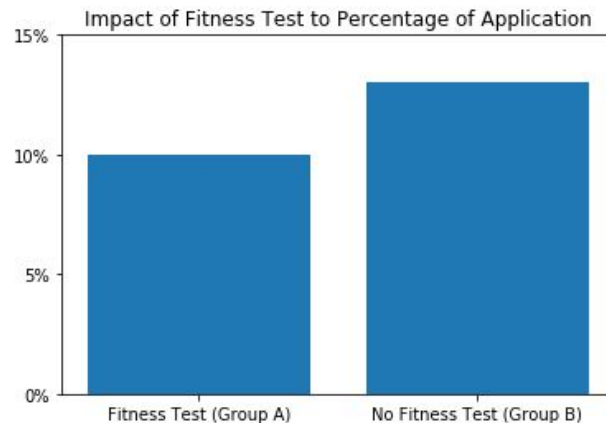
For the three hypothesis tests, the study applied the Chi-squared Tests on the result found from the two groups to see there were any statistical significance that the results of the two groups were different.

Chi-Square test is very useful in A/B test, and in this case, where half of the customer had taken the fitness test and the other half hadn't.

The null hypothesis in this test is that there is no significant difference between the two groups and if we get a p-value less than 0.05, we reject this hypothesis and conclude that there is a significant difference between the two.

# The Results (Test 1)

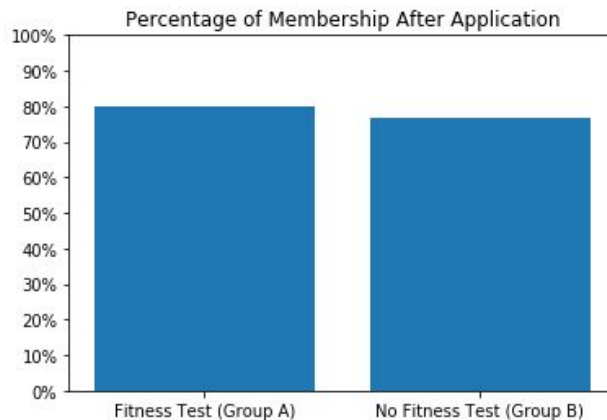
Test 1 - The percentage of visitors who made an application from, Group A - Taken Fitness Test, and Group B - No Fitness Test.



Result - 13% of the customer who didn't take the fitness test (Group B) applied, as opposed to 9.98% of the customer who took the test. The p-value was 0.00096, indicating a statistical significance!

# The Results (Test 2)

Test 2 - Of the customer who made an application, the percentage of customer who eventually purchased a membership.

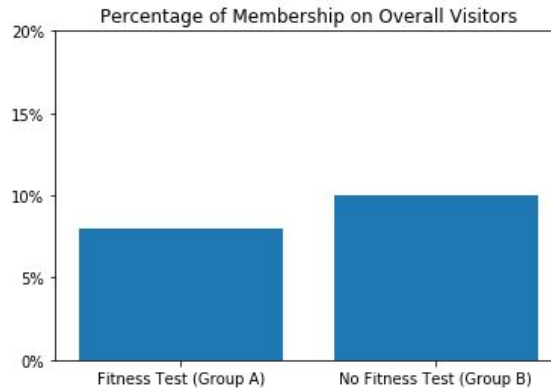


Result - In Group A, 80% of the customer who made an application later became a member, as opposed to a 76.9% application to membership conversion rate in Group B. The p-value was 0.433, indicating no statistical significance and we did not reject the null hypothesis!



# The Results (Test 3)

Test 3 - Percentage of the overall customer who eventually purchased a membership.



Result - as expected, 10% of the customer in Group B later became a member, as opposed to a 7.99% of the customer in Group A. The p-value was 0.015 from the chi-squared test, suggesting there was a statistical significance to the difference and we rejected the null hypothesis!

# Conclusion

The study was concluded with three main findings:

1. Customers who do not take the fitness test are more likely to fill out an applications form for the gym than customers who do take the fitness test.
2. There is no statistical evidence that suggests fitness tests have any impact on whether customers who made an application for the gym will eventually sign up for a membership.
3. Customers, however, are more likely to become a member if they do not take the fitness test. This is very likely to be the knock-on effect from Finding 1.

Janet's hypothesis that visitors assigned to Group B, who skip the fitness test, will be more likely to eventually purchase a membership to MuscleHub, has statistical significance.

# Recommendation

The following recommendations are given to MuscleHub according to the findings of this study:

1. Fitness test prior to joining the gym should be optional, as suggested by the findings of this study, it does discourage people from becoming members to the Gym
2. If fitness test is essential, it is then recommended the test to be taken after a customer has filled out an application, as result suggests the test has no significant impact on application membership conversion rate.