



MuscleHub A/B Test

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Course: Introduction to Data Analysis

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The A/B Test

Being hired by the MuscleHub gym company, I was to run an A/B test on random visitors that are looking to purchase a gym membership. The gym have an membership process that visitors go through in their journey to obtain a membership. First, the visitor takes a fitness test with a personal trainer. Secondly, the applicant fills out an application. And lastly, they must send in payment for the first month of membership. Believing that the first step, taking a fitness test with a personal trainer, is one that deter members from going through with the whole process of purchasing a membership, the manager, Janet, decided to test the theory by doing an A/B test. The test would have half the visitors, Group A, take the personal trainer fitness test and the other half, Group B, would not take the test and see if the theory holds true. Janet's theory is that more visitors from Group B would eventually purchase a membership.

Data Sets

There were four datasets that our information was pulled from:

- Visitors log which consisted of all the individuals who visited the gym over a five month period from May to September. The log included the visitor's first name, last name, email address, sex, and date of birth
- Fitness Test log which consisted of all the members who participate in the fitness test. This log include all the same information from the visitors log expect in place of the DOB it included date of test
- Application log which consisted of the visitors who actually filled out the application for membership. Included were the same information from the previous two datasets but replace with application date instead of test date
- Purchase log which consisted of applicants who actually purchased a membership of applying. Included was all information from previous sets but replaced purchase date in place of application date
- After reviewing all the data, I combined into one dataframe with the visit date, fitness test date if they took it, application data if they applied, and the date they purchase if they did so

Hypothesis Tests

There were 3 test conducted throughout this research:

- Test 1: Statistical significant in the amount of individuals who either tested or did not test and went on to fill out the application for membership
- Test 2: Statistical significant in the amount of individuals who either tested or did not test and made a purchase after filling out the application
- Test 3: The percentage and significant difference in individual who visited the gym and either purchased a membership or do not purchase
- To determine if the results of the test were significant and rejects the null hypothesis, I did a Chi-Square testing method that returns a Probability Value that determines if the null hypothesis should be rejected ($pval < 0.05$)

Test 1: Percent of Visitors Who Applied

- The first test tested the number of individuals from both groups who visited and applied opposed to those who visited and did not apply. Group A were individuals who test and Group B of those who did not test. The results showed that more people from group B had went on to fill out the application
- This result seemed significant taking into consideration that group B were the individuals who did not take the fitness test so they were not deterred from application based off the test alone
- On seeing the difference, I wanted to determine if the difference was statistically significant opposed to the null hypothesis that there was no significant difference
- Test 1 $p\text{-value} = 0.000964$ (less than 0.05) so that determined that there was a significant difference
- Conclusion = Doing a fitness test has an impact on visitors filling out application

Test 2: Percent of Visitors Who Applied & Purchased

- The second test was conducted to see the results of those individuals who visited, applied, and purchased a membership from both groups
- The results of this test showed that of the members who did or did not team, more of the individuals who tested and applied actually purchased the membership opposed to the individuals who did not test and applied
- This result seemed significant due to the fact that if you were an individual who tested you may have seen the benefit of the test and working out. Also, a trainer can positively influence your opinion about the gym
- Test 2 $p\text{val} = 0.4326$ (greater than 0.05) so that determined that there was not a significant difference
- Conclusion = There is not a significant difference in members who purchased in relations to them filling out the application after testing or not testing proving the null hypothesis

Test 3: Percent of All Visitors Who Purchased Membership

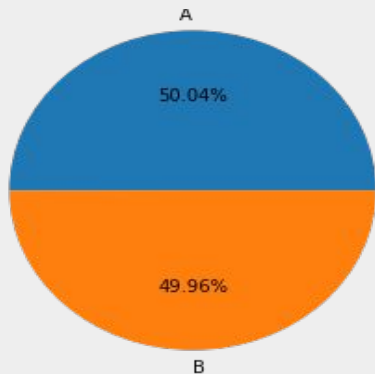
- The final test was conducted to see the total number and percent of visitors from each group who purchased a membership opposed to those who did not purchase.
- The null hypothesis in this test was the amount of visitors paying for membership after testing having no significant difference then that of the individuals who did not test and purchased membership.
- One of the result of this test concluded that more individuals who did not test eventually purchased a membership.
- Test 3 $p\text{val} = 0.0147$ (less than 0.05) so this determined that there was a significant difference.
- Conclusion = There is a significant difference between the two groups when it come to visitors applying and purchasing a membership.

Qualitative Data - Visitors Interviews

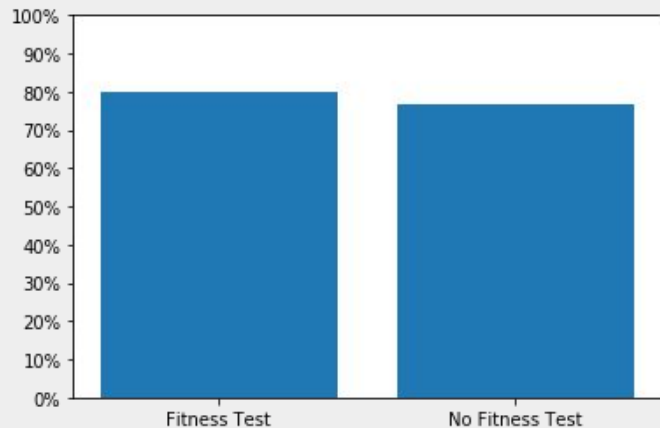
<u>Group</u>	<u>Member</u>	<u>Non-Member</u>	
A	Cora, 23, Hoboken	Sonny "Dad Bod", 26, Brooklyn	
B	Shirley, 22, Williamburg	Jesse, 35, Gowanes	
	<u>Member</u>	<u>Non-Member</u>	<u>Total</u>
A	200 (7.98%)	2304 (92.02%)	2504
B	250 (10%)	2250 (90%)	2500
	Group A - Tested		
	Group B - Not Tested		

Data Diagrams - QD Continue

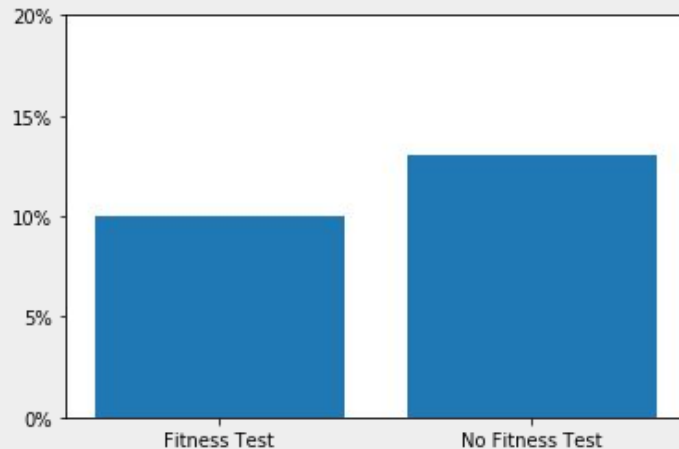
A/B Testing Data



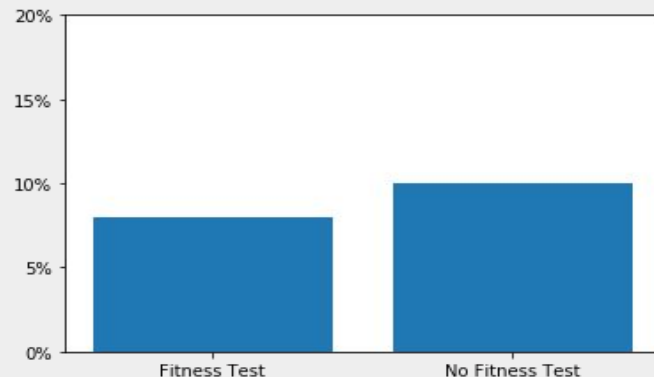
Applicants Who Purchased Membership



Visitors Who Applied



Visitors Who Purchased Membership



Testing Visual Charts - QD Continue

<u>A/B Test Group</u>	<u>Application</u>	<u>No Application</u>	<u>Total</u>	<u>% w/ Application</u>
A	250	2254	2504	9.98%
B	325	2175	2500	13%
<u>A/B Test Group</u>	<u>Member</u>	<u>Not Member</u>	<u>Total</u>	<u>% Membership Purchase</u>
A	200	50	250	80%
B	250	75	325	76.92%
<u>A/B Test Group</u>	<u>Member</u>	<u>Not Member</u>	<u>Total</u>	<u>% Membership Purchase</u>
A	200	2304	2504	7.98%
B	250	2500	2500	10%

Recommendation for MuscleHub

- Taking into consideration the decrease in applicants after taking the fitness test, I recommend strapping the test as part of the membership process and add as a separate package if a visitor would like one
- Overall, individuals who visited and did the personal training test became members, so I suggest giving the option of the test at the beginning and presenting the benefits with respect to health and fitness so that they can increase the possibility of memberships
- Also, checking duration of gym usages up front so that you can identify who possible would benefit from the fitness test