MuscleHub
A/B Analysis and Recommendations

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A/B Test

- Question:
  - How does requiring a fitness test as part of MuscleHub's onboarding process impacting membership uptake for new clients?
- Test:
  - A test was conducted to see if our current membership onboarding is impacted by requiring applicants to go through a fitness test prior to applying for membership
  - New clients were randomly put through 2 onboarding process
    - A: Standard onboarding where a fitness test was given prior to application submission.
    - B: Modified onboarding where new clients were given an application without fitness test.
- Goal:
  - Observe the membership uptake for each group and use statistical analysis to determine how the fitness test requirement impacts membership uptake.

Data Set Summary

- Data set includes four SQL databases, individually containing records for the following: client visits, fitness tests, applications submission, and membership payments. Each database shares the same primary key which include first name, last name and email address. Each database entry has a date to record the event.
- A composite panda dataframe is generated by using a SQL OUTER JOIN, using the visits database as the left table (to capture all clients) and joining each of the other databases.
  - For this master dataframe, the presence of fitness_test_date indicates it follows Test Scenario A, while a NULL date indicates it belongs to Test Scenario B (no fitness test required). Application Date indicates if a client submitted an application and Payment Date indicates if a client has signed up as a member.
- We then can isolate data for users on boarded using Test Scenario A and Test Scenario B and check rates of application submission and membership signups.
- Finally, using Hypothesis Testing, we can see if any differences in membership signups between scenarios follows Null Hypothesis or whether there is a significant difference.
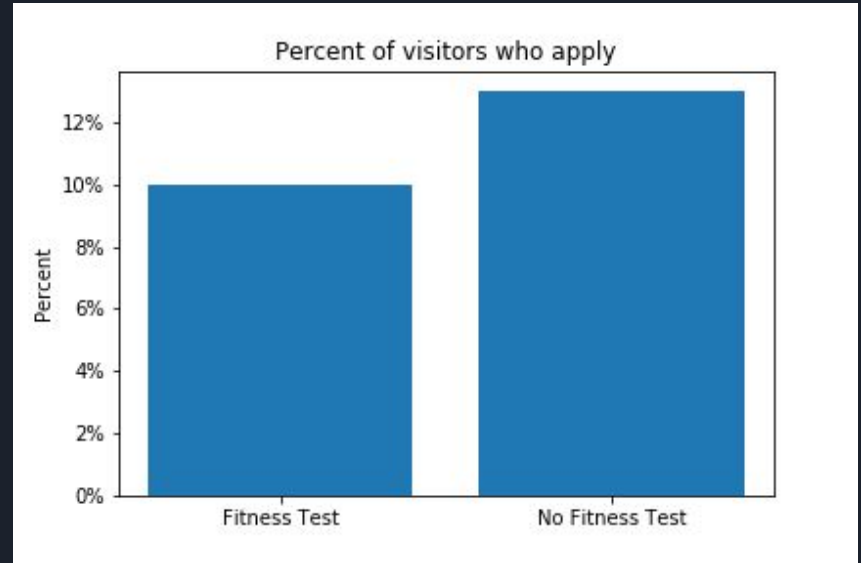
Hypothesis Testing and Results

- The following hypothesis testing was done and the results are shown below. For each hypothesis testing, a binomial test was performed, comparing results from one test to the other to check if the differences are statistically significant. The binomial test works for this scenario because there is only two outcomes expected, whether a client becomes a member or not. We compare the success rate of one scenario with the other to see if they meet the Null Hypothesis or not.
- Results:
  - Hypothesis Test 1:
    - For groups A (fitness test) and B (no fitness test) check if there is significant difference in clients filling out an application.
      - Results: Per binomial test, pval = $1.2669e-06 < 0.05$ indicating that there is significant difference. It seems not having to do a fitness test, makes it more attractive for clients to submit an application.
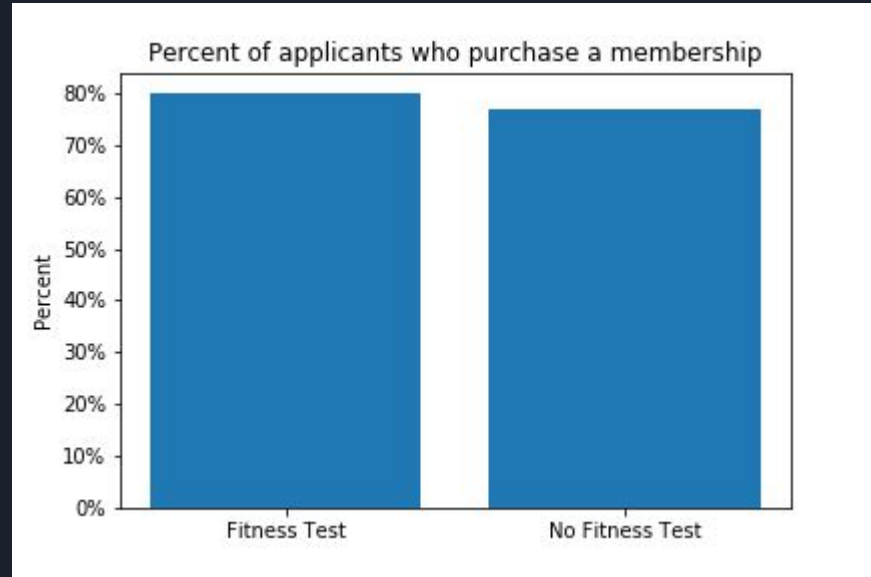
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    - The chart on the right shows the % of clients who apply for Group A (fitness test required) ~~10% and GroupB (No fitness test) ~%13.

Percent of visitors who apply
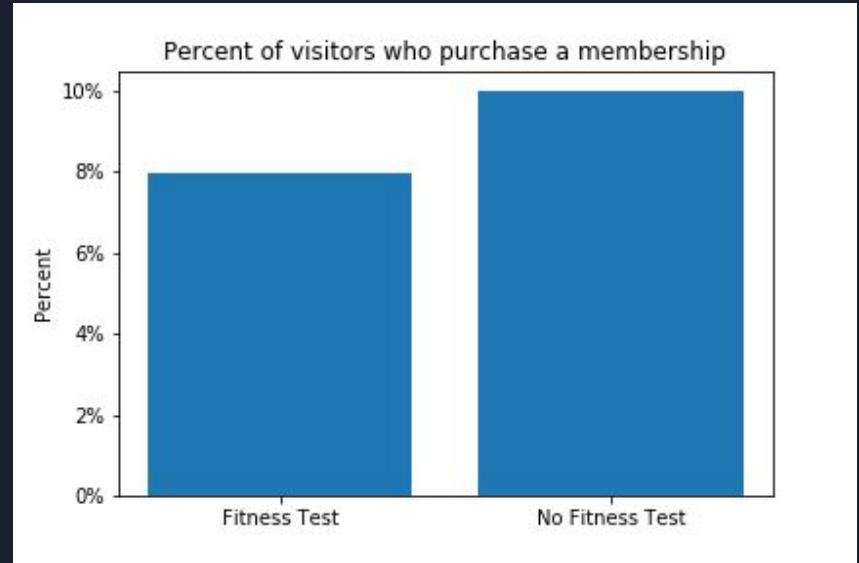
Hypothesis Testing and Results

- Hypothesis Test 2
  - For groups A (fitness test) and B (no fitness test) check if there is significant difference in membership rates for clients that filled out an application.
  - Results: Per binomial test, pval = 0.1657 > 0.05 indicating that there is no significant difference. This means that for clients that submitted an application, the fitness test had no significant impact on whether or not they became members.
  - The diagram on the right shows % of applicants for each Group that have applied who go on to purchase a membership. Per test results, any difference here is due to NULL hypothesis and is not significant.

Hypothesis Testing and Results

- Hypothesis Test 3
  - For groups A (fitness test) and B (no fitness test) check if there is significant difference in membership signup.
    - Results: Per binomial test, pval = 0.00059 < 0.05 indicating that there is significant difference. This means that requiring a fitness test adversely affected the number of clients that signed up for membership
    - The diagram on the right shows the membership sign up results for GroupA (fitness test required) vs. GroupB (No fitness test). The binomial test shows there is a significant difference in sign up rates if a fitness test is required.

Percent of visitors who purchase a membership

Summary

Based on the data and hypothesis testing, we do see that requiring a fitness test negatively impacts membership rates. For Group A which required a fitness test prior to submitting an application, the membership rates was 7.987%   For Group B which did not require a fitness test prior to submitting an application, membership rates is 10%

Recommendations

Based on our findings, we recommend not requiring a fitness test for new clients as part of becoming a member. We anticipate that this change will positively increase membership rates signups overall by 2%