MuscleHub A/B Test

MuscleHub, a gym, uses the following steps when a visitor considering buying a membership:

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

MuscleHub’s management wants to test if the fitness test intimidates the prospective members.

The following A/B test was set up in order to check the above.
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.

MuscleHub has a SQLite database, which contains the following tables:

- **visits** contains information about potential gym customers who have visited MuscleHub.
- **fitness_tests** 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. Not everyone in visits will have filled out an application.
- **purchases** contains information about customers who purchased a membership to MuscleHub.

We run three hypothesis tests.

In all tests we used chi square test because we have two categorical variables from a single population and we want to determine whether there is a significant association between the two variables.

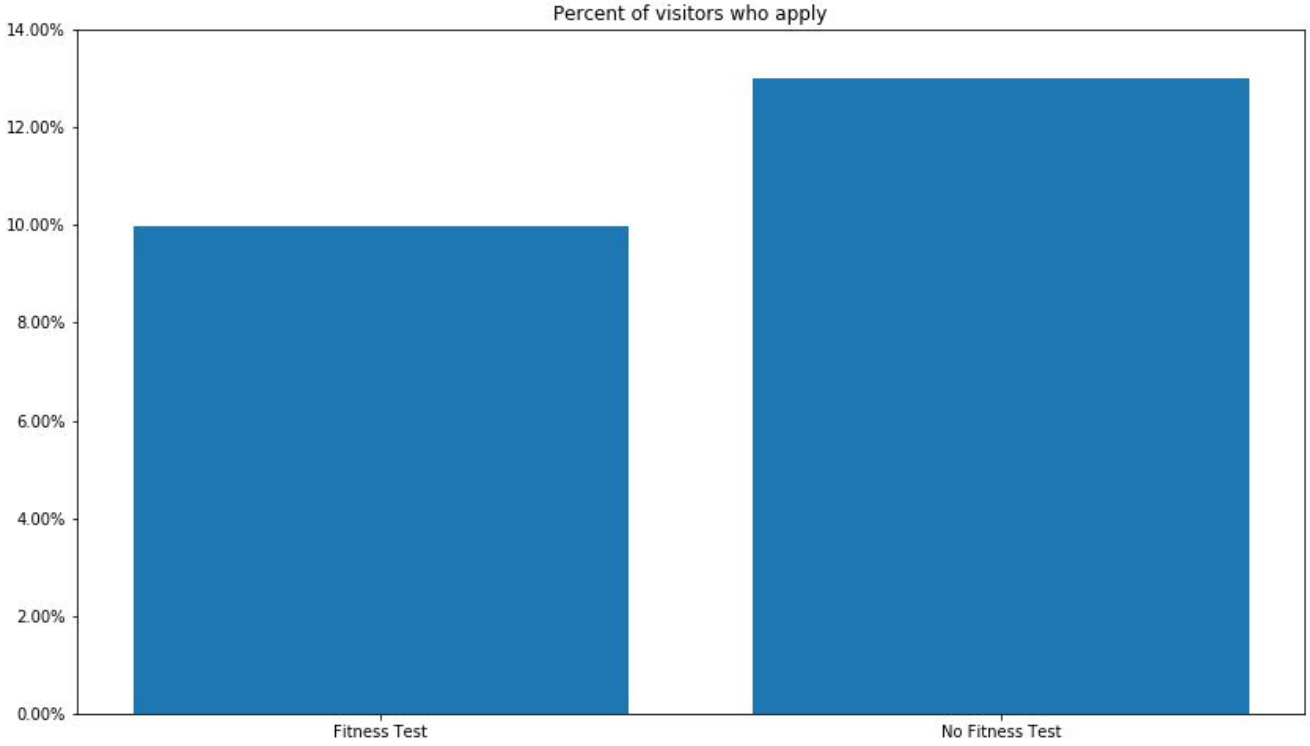
First Test:

We calculate the percent of people in each group who complete an application after their visit.

Test Group	Application	No Application	Total	Percent with Application
A	250	2254	2504	9,98%
B	325	2175	2500	13,00%

Significance Test Results:

The chi square test gave us a P value of 0.00096 which is less than 0.05, so we can say that our result is **significant**!


Percent of visitors who apply
14.00%
12.00%
10.00%
8.00%
6.00%
4.00%
2.00%
0.00%
Fitness Test
No Fitness Test

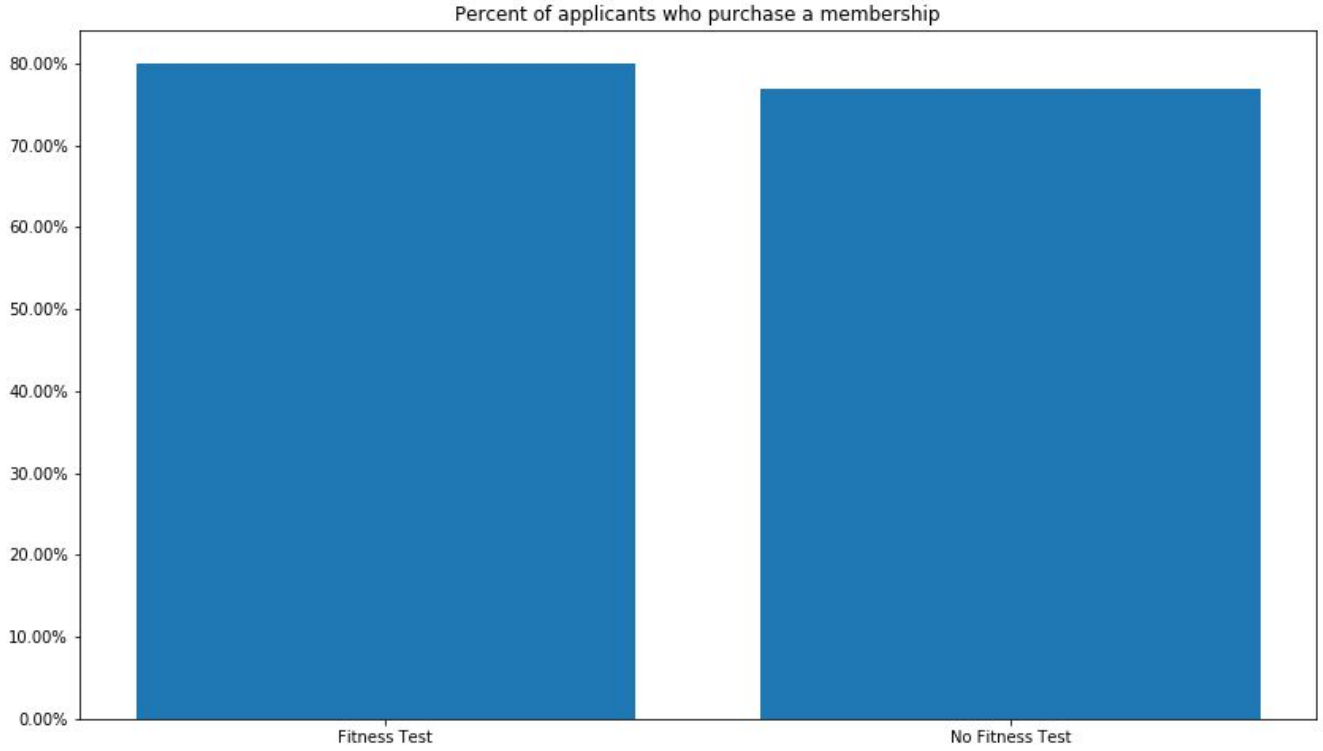
Second Test:

We calculate the percent of people in each group who completed an application after their visit and end up purchasing a membership.

Test Group	Member	Not Member	Total	Percent Purchase
A	200	50	250	80,00%
B	250	75	325	76,92%

Significance Test Results:

The chi square test gave us a P value of 0.43258 which is more than 0.05, so we can say that our result is **not significant**!


Percent of applicants who purchase a membership
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
Fitness Test
No Fitness Test

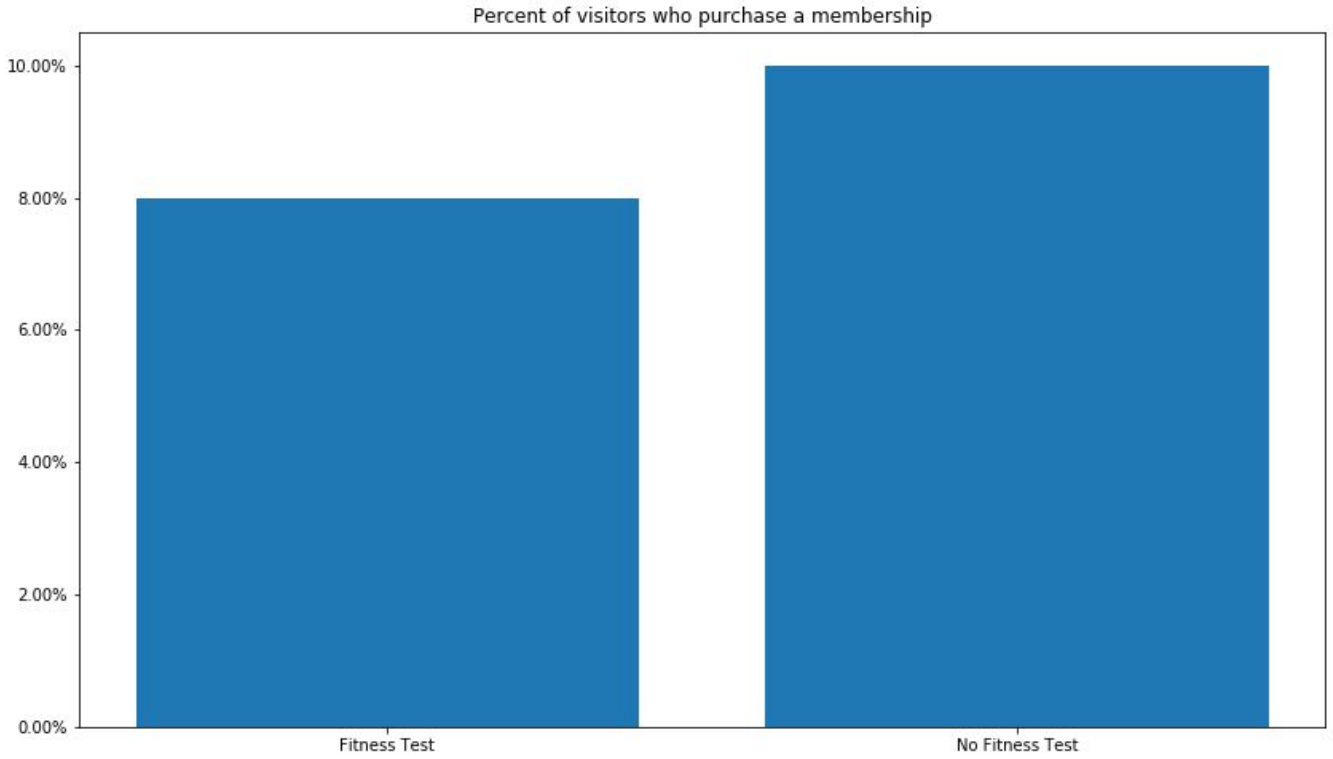
Third Test:

We calculate the percent of all people who visited the gym that end up purchasing a membership.

Test Group	Member	Not Member	Total	Percent Purchase
A	200	2304	2504	7,99%
B	250	2250	2500	10,00%

Significance Test Results:

The chi square test gave us a P value of 0.01472 which is less than 0.05, so we can say that our result is **significant**!


Percent of visitors who purchase a membership
10.00%
8.00%
6.00%
4.00%
2.00%
0.00%
Fitness Test
No Fitness Test

Results:

The first test reveals that people in group B is more probable to complete an application after their visit, chi square test gave us statistical significance for the result.

The second test reveals that people in group A is more probable to buy membership if they have completed the application first, chi square test showed no statistical significance.

The third test reveals that there is a higher chance for people in group B to buy a membership after their visit, chi square test gave us statistical significance for the result.

Recommendation:

MuscleHub management was right to think that the fitness test was intimidating for new visitors. Results revealed 3% more applications and 2% more memberships for the people who did not take the fitness test.

Despite the fact that there were 3% more memberships for the people who took the fitness test and completed the application, we cannot take this result into account because there was no statistical significance.

Therefore we recommend MuscleHub management to discard the fitness test.