

# MuscleHub A/B Test: Project summary

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CAPSTONE PROJECT 1

RANSHENG DING

# How does the fitness test matter?

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How does a MuscleHub visitor become a member?

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

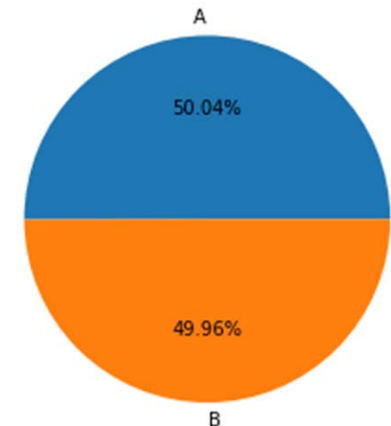
**Question:** Does taking fitness test strategy help more visitors become a member?

**Solution:** An A/B testing on MuscleHub's customer data.

To clarify:

Group A: Visitors who did a fitness test

Group B: Visitors who did not do a fitness test



Percentage of MuscleHub visitors who did(A) or did not(B) do fitness test.

# Data analysis procedure

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1. Extract and left join fitness test, applicants, purchases database to visitors database based on customer's name and email, keep the visit date no earlier than 7-1-2017. This giant merged database is converted into a crude dataframe for A/B testing.
2. Segregate the visitors in 2 groups, those who did fitness test are in group A, otherwise in group B. The visitor percentage for group A and group B is plotted.
3. The above dataframe is further segregated using another application or membership condition. The visitor number in each subgroup are counted, the percentage of visitors who applied or purchased in group A and B are calculated respectively.
4. The visitor behavior difference between group A and B are compared using hypothesis test.

# Analysis 1: Does the fitness test make more visitors fill out application?

The visitors in A/B groups are segregated and counted based on whether they filled out application.

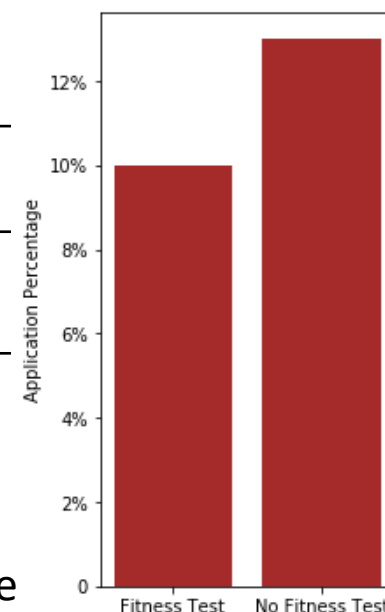
The results are summarized in the pivot table and plotted.

is_application	ab_test_group	Application	No Application	Total	Percent with Application
0	A	250	2254	2504	0.09984
1	B	325	2175	2500	0.13000

To compare the visitors did or did not filled out application between A and B group, chi square test is the appropriate hypothesis test to use.

The p-value obtained is 0.000965, even smaller than 0.01, indicating the null hypothesis should be rejected and there is significant difference.

The group of visitors who did not take the fitness test are more willing to fill out an application.



## Analysis 2: Does the fitness test make more applicants become a member?

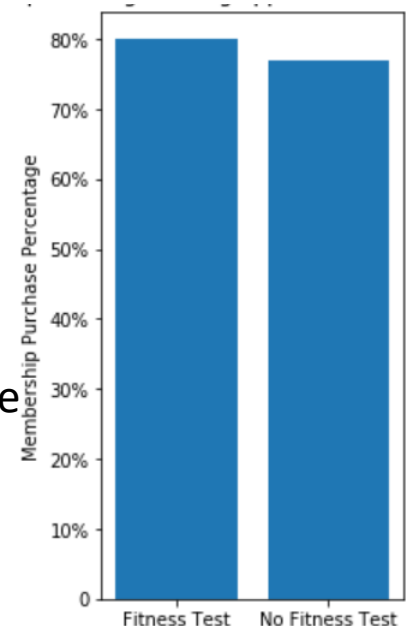
This time only visitors who filled out application in A/B groups are segregated and counted based on whether they purchased membership. The results are summarized in the pivot table and plotted.

is_member	ab_test_group	Member	Not Member	Total	Percent Purchase
0	A	200	50	250	0.800000
1	B	250	75	325	0.769231

To compare categorical datasets in multiple groups, chi square test is the appropriate hypothesis test to use.

The p-value obtained is 0.432586, greater than 0.05, indicating the null hypothesis cannot be rejected and there is no significant difference between A/B group.

After the visitor finished application, the taking of fitness test does not affect their tendency to purchase membership.



## Analysis 3: Overall, does the fitness test make more visitors become a member?

Lastly all visitors in A/B groups are segregated and counted based on whether they purchased membership.

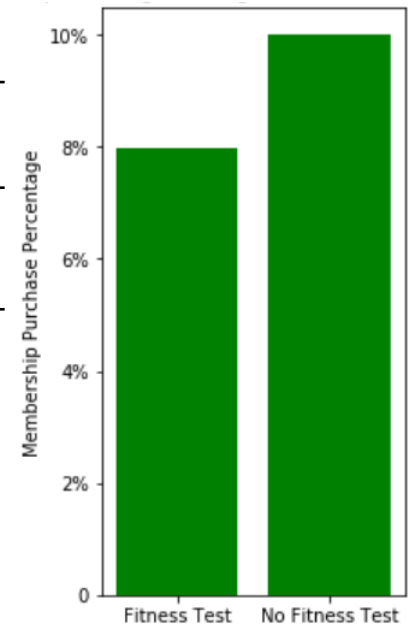
The results are summarized in the pivot table and plotted.

is_member	ab_test_group	Member	Not Member	Total	Percent Purchase
0	A	200	2304	2504	0.079872
1	B	250	2250	2500	0.100000

Likewise, chi square test is used to compare the A/B group difference.

The p-value obtained is 0.014724, less than 0.05, indicating the null hypothesis can be rejected and there is significant difference between A/B group.

For the total visitor population, the taking of fitness test tend to make fewer visitors purchase membership.



## Visitor's feedback (selected)

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*"I saw an ad for MuscleHub on BookFace and thought I'd check it out! The people there were super friendly and the whole sign-up process took a matter of minutes. I tried to sign up for LiftCity last year, but the fitness test was way too intense. This is my first gym membership EVER, and MuscleHub made me feel welcome."*

- Shirley, 22, Williamsburg

*"I always wanted to work out like all of the shredded people on the fitness accounts I see on Instagram, but I never really knew how to start. MuscleHub's introductory fitness test was super helpful for me! After taking the fitness test, I had to sign up and keep coming back so that I could impress my trainer Rachel with how much I was improving!"*

- Cora, 23, Hoboken

# Conclusion/recommendation

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- The taking of fitness test does not affect visitors' tendency to purchase membership after they complete application. However taking the fitness test will make fewer visitors fill out application, thus lower the visitor to member conversion rate.
- Although the fitness test seems helpful to customers with high fitness goal and determined mind, many visitors don't like the fitness test for various reasons, such as they don't want to be accompanied by personal trainer promoting membership or the fitness test is too intense etc.
- Overall, the fitness test intimidates some MuscleHub's potential members away. I suggest to remove the fitness test from the membership buying process.