



# Research Results for MuscleHub Membership Plan

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# Background

- MuscleHub has recently proposed changing their membership enrollment process in order to achieve more members.
- Currently, the membership enrollment process is as follows:
  1. Perspective member takes a standard fitness test with MuscleHub trainer.
  2. The perspective member fills out a MuscleHub application form.
  3. Once received by MuscleHub, the member then purchases a membership.
- Janet, the manager of MuscleHub, believes that the initial fitness test may intimidate perspective members.

# Background

- In order to test this, MuscleHub conducted a series of A/B testing. New visitors were randomly assigned to two groups:
  - **Group A** was subjected to the current process, whereby a fitness test was conducted prior to submitting an application.
  - **Group B** skipped the fitness test portion of the current process, and just submitted the application.
- In this test, the null hypothesis is that visitors assigned to **Group B** were more likely to purchase a membership than those in **Group A**.

# Data Provided by MuscleHub

- MuscleHub provided access to their membership data, a SQLite database, which was collected over the past few quarters. Tables that were provided were for visits, fitness tests, applications, and purchases.
- The data pertinent to our research was only after the A/B test began, which was on 7/1/2017.
- To provide ease of manipulation, these four tables were combined into one singular table, joined on the customer's first and last name as well as their email address. Data was also filtered by date to capture relevant data to the test.

# Data Provided by MuscleHub

	index	first_name	last_name	email	gender	visit_date
0	0	Karen	Manning	Karen.Manning@gmail.com	female	5-1-17
2	index	first_name	last_name	email	gender	application_date
3	0	Roy	Abbott	RoyAbbott32@gmail.com	male	2017-08-12
4	1	Agnes	Acevedo	AgnesAcevedo1@gmail.com	female	2017-09-29
5	2	Roberta	Acevedo	RA8063@gmail.com	female	2017-09-15
6	3	Darren	Acosta	DAcosta1996@hotmail.com	male	2017-07-26
7	4	Vernon	Acosta	VAcosta1975@gmail.com	male	2017-07-14

	index	first_name	last_name	email	gender	fitness_test_date
0	0	Kim	Walter	KimWalter58@gmail.com	female	2017-07-03
2	index	first_name	last_name	email	gender	purchase_date
3	0	Roy	Abbott	RoyAbbott32@gmail.com	male	2017-08-18
4	1	Roberta	Acevedo	RA8063@gmail.com	female	2017-09-16
5	2	Vernon	Acosta	VAcosta1975@gmail.com	male	2017-07-20
6	3	Darren	Acosta	DAcosta1996@hotmail.com	male	2017-07-27
7	4	Dawn	Adkins	Dawn.Adkins@gmail.com	female	2017-08-24

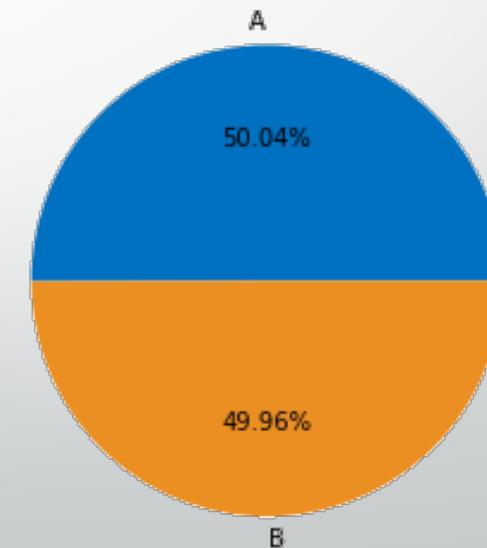
Using SQLite, the database was compiled into a single, relevant table.

	first_name	last_name	gender	email	visit_date	fitness_test_date	application_date	purchase_date
0	Kim	Walter	female	KimWalter58@gmail.com	7-1-17	2017-07-03	None	None
1	Tom	Webster	male	TW3857@gmail.com	7-1-17	2017-07-02	None	None
2	Edward	Bowen	male	Edward.Bowen@gmail.com	7-1-17	None	2017-07-04	2017-07-04
3	Marcus	Bauer	male	Marcus.Bauer@gmail.com	7-1-17	2017-07-01	2017-07-03	2017-07-05
4	Roberta	Best	female	RB6305@hotmail.com	7-1-17	2017-07-02	None	None

# Summary of Data Collected

- To ensure a valid A/B test, MuscleHub needed to split both groups evenly. As seen below, the groups are nearly identical in size. The data was assumed to be randomly collected.

Group	Members
A	2504
B	2500

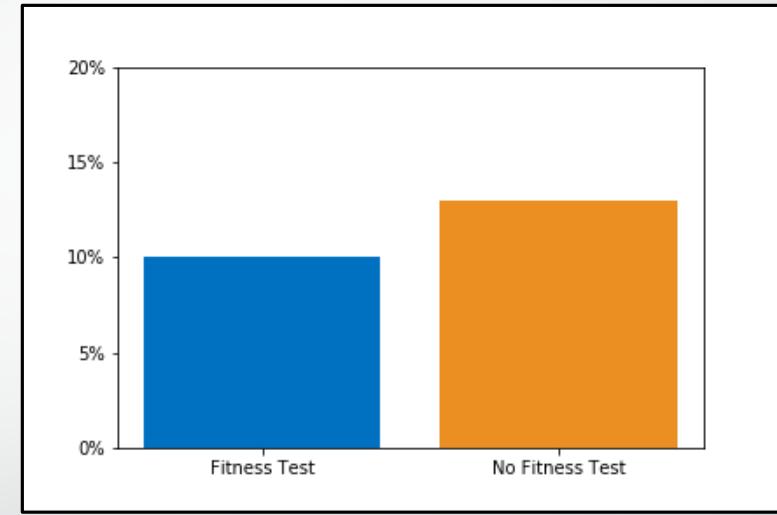


# Overview of Data Analysis

- Recall the difference in membership application between **Group A** and **Group B**:
  - **Group A** was subjected to the current process, whereby a fitness test was conducted prior to submitting an application.
  - **Group B** skipped the fitness test portion of the current process, and just submitted the application.
- While we are interested in determining if there is any difference between membership likelihood and the fitness test, it is also necessary to test for variance at each stage. Therefore, three null hypotheses were tested:
  1. There is no difference in application rate between visitors in the two groups.
  2. There is no difference in membership rate between applicants in the two groups.
  3. There is no difference in membership rate between visitors in the two groups.
- To test these hypotheses, a  $\chi^2$  test was utilized. This was based on the types of hypotheses being tested (e.g., there is no difference...), the randomness of the sample, and due to the uncertainty of the distribution.

# Hypothesis 1 – Reviewing the data

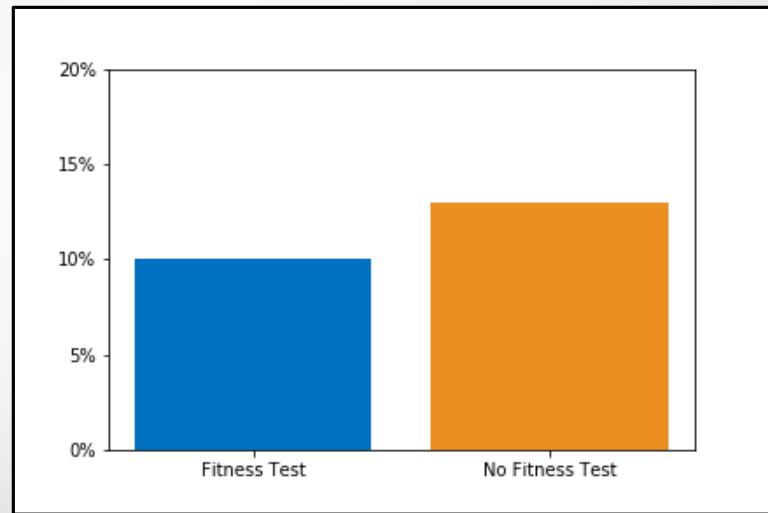
- This test was designed to test the null hypothesis that there is no difference between:
  - **Group A**, who was required to take a fitness test prior to submitting an application; and
  - **Group B**, who could submit an application just after visiting with no fitness test required.
- As seen here, **Group B** was more likely to submit an application. Is this significant?



Test Group	Total Applications Submitted	Group Size	Percent that Submitted Application
A	250	2504	9.98%
B	325	2500	13.00%

# Hypothesis 1 – Analyzing the data

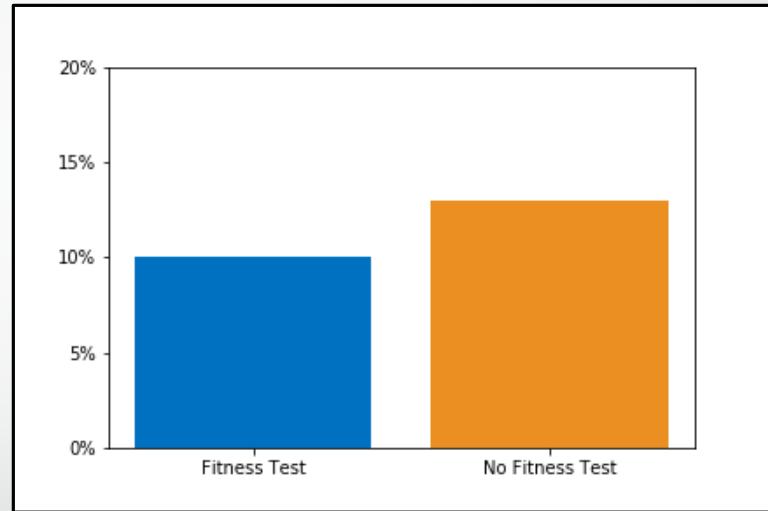
- In order to assess if this result is significant, a  $\chi^2$  test was performed. The null hypothesis was that there is no difference in application rate between the two groups.
- The resultant p-value was 0.000965.
- Since our p-value is less than 0.05, we can reject the null hypothesis and claim that there is a significant difference between the two groups.



Test Group	Total Applications Submitted	Group Size	Percent that Submitted Application
A	250	2504	9.98%
B	325	2500	13.00%

# Hypothesis 1 – Conclusions

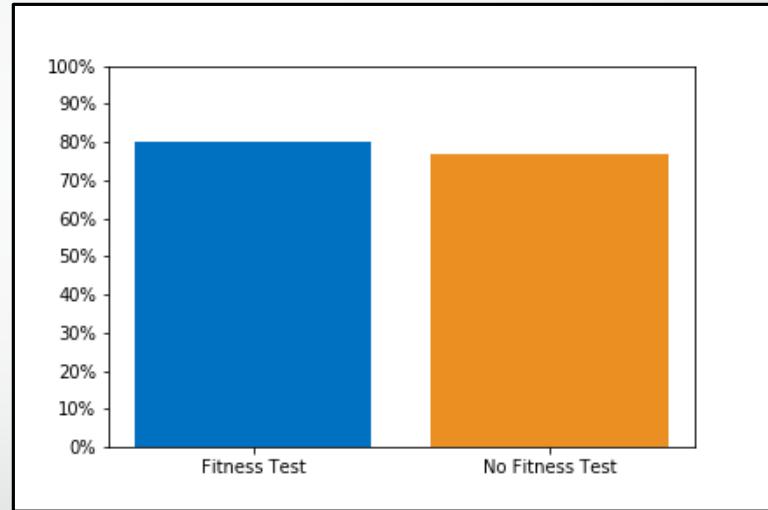
- **Result:** Potential customers are more likely to submit an application to become a member when not required to take a fitness test.



Test Group	Total Applications Submitted	Group Size	Percent that Submitted Application
A	250	2504	9.98%
B	325	2500	13.00%

## Hypothesis 2 – Reviewing the data

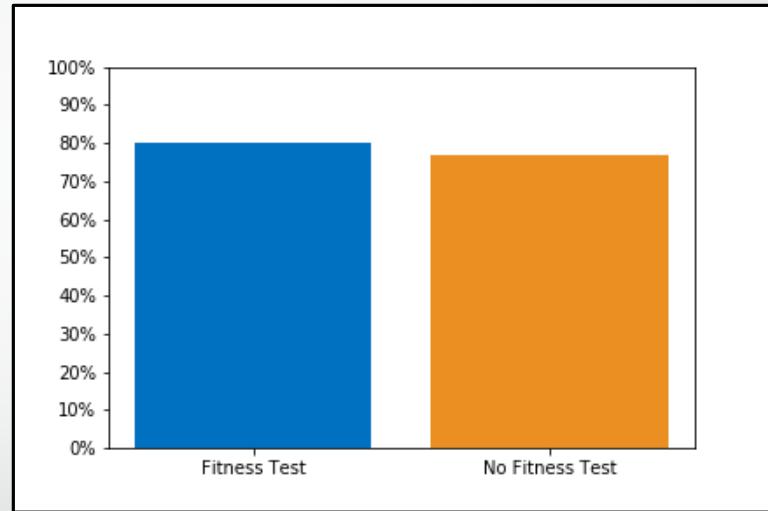
- The second test conducted tested the null hypothesis that applicants in both groups are equally likely to purchase a membership.
- As seen here, **Group A** was slightly more likely to purchase a membership. Is this significant?



Test Group	Total Membership Registrations	Total Applicants	Percent that Submitted Application
A	200	250	80.0%
B	250	325	76.9%

## Hypothesis 2 – Analyzing the data

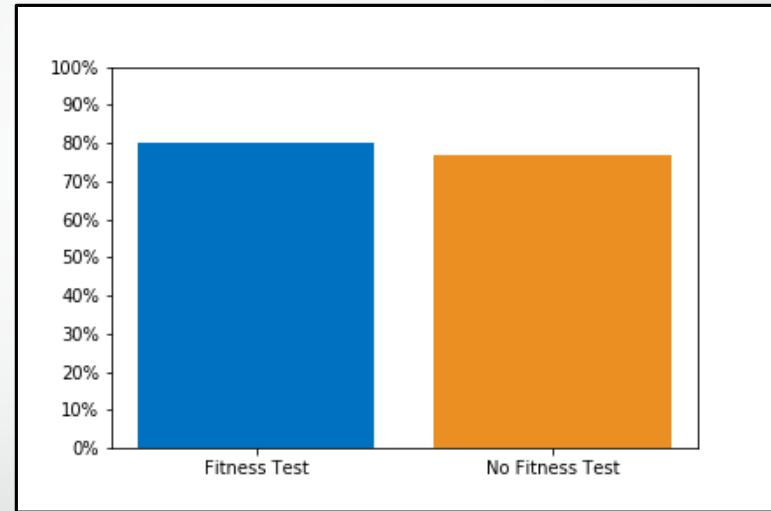
- The null hypothesis was that there is no difference in membership purchase rate between the two groups.
- The resultant p-value from the  $\chi^2$  test was 0.43.
- Since this p-value is greater than than 0.05, we can't reject the null hypothesis and therefore no significant difference in membership purchasing exists between the two groups.



Test Group	Total Membership Registrations	Total Applicants	Percent that Submitted Application
A	200	250	80.0%
B	250	325	76.9%

## Hypothesis 2 – Conclusions

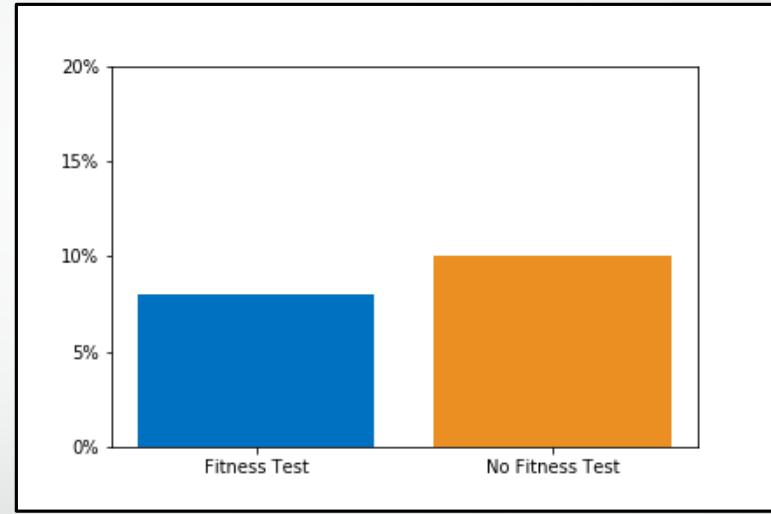
- **Result:** Once a visitor has applied, the past performance of the fitness test does not significantly affect the applicants likelihood of paying for membership.



Test Group	Total Membership Registrations	Total Applicants	Percent that Submitted Application
A	200	250	80.0%
B	250	325	76.9%

# Hypothesis 3 – Reviewing the data

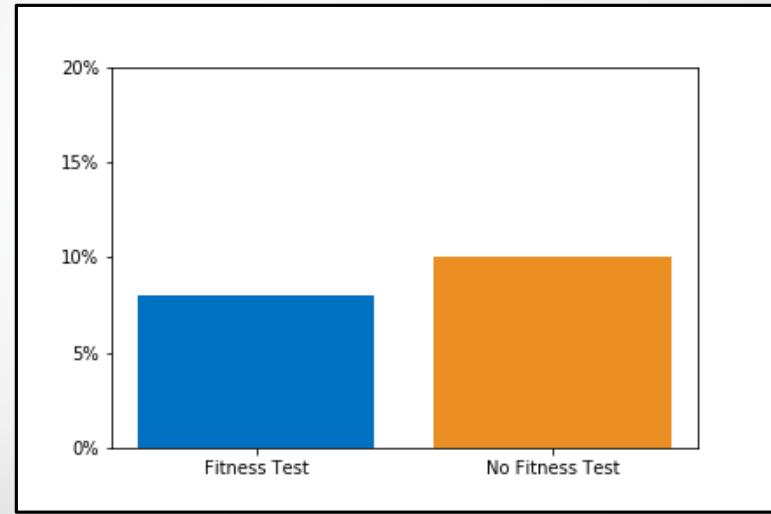
- The final test conducted tested the null hypothesis that visitors in both groups are equally likely to purchase a membership.
- As seen here, **Group B** was more likely to purchase a membership. Is this significant?



Test Group	Total Membership Registrations	Total Visitors	Percent that Submitted Application
A	200	2504	7.99%
B	250	2500	10.00%

## Hypothesis 3 – Analyzing the data

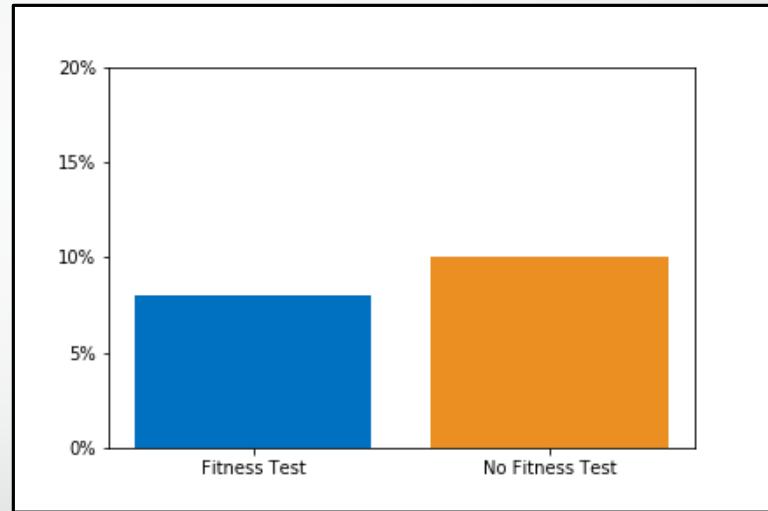
- The null hypothesis was that there is no difference in membership purchase rate between the two groups.
- The resultant p-value from the  $X^2$  test was 0.015.
- Since this p-value is less than than 0.05, we can reject the null hypothesis and therefore there is a significant difference in membership purchasing between the two groups.



Test Group	Total Membership Registrations	Total Visitors	Percent that Submitted Application
A	200	2504	7.99%
B	250	2500	10.00%

# Hypothesis 3 – Conclusions

- Result: A visitor who does not take the fitness test is more likely to purchase a membership.



Test Group	Total Membership Registrations	Total Visitors	Percent that Submitted Application
A	200	2504	7.99%
B	250	2500	10.00%

# Qualitative Data Results

*"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)

*"I saw an ad for MuscleHub on BookFace and thought I'd check it out! The people there were suuuuper 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)

*"When I walked into MuscleHub I wasn't accosted by any personal trainers trying to sell me some mumbo jumbo, which I really appreciated. Down at LiftCity they had me doing burpees 30 seconds after I walked in the door and I was like "woah guys slow your roll, this is TOOOO much for Jesse!" I still ended up not signing up for a membership because the weight machines had all those sweat stains on them and you know, no thanks."* (Jesse, 35, Gowanus)

*"I took the MuscleHub fitness test because my coworker Laura recommended it. Regretted it."* (Sonny "Dad Bod", 26, Brooklyn)

## Summary

Most visitors do not appreciate being subjected to a fitness test when applying for a gym membership, but a non-zero amount find value in it.

# Conclusion

- **Summary**

Based on the significance of the results of the  $X^2$  tests, the following can be stated:

- A visitor is more likely to become an applicant and eventually a member if not required to take the fitness test when applying to MuscleHub.
- There is no significant difference in membership likelihood among applicants who do or do not take the fitness test.

- **Recommendation**

MuscleHub should discontinue mandatory performance of a fitness test as a requirement for membership application. Since there is no notable difference in membership likelihood between applicants who have and have not taken the fitness test, MuscleHub could still continue to use fitness tests in an optional capacity when visitors are inquiring for application. This is supported by the interviews conducted (see Qualitative Data).