Capstone Option 1: Muscle A/B Test

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Section 1: Description of A/B Test

- Normal process of obtaining MuscleHub membership:-

Figure 1: MuscleHub Membership Process

- Question(posed by Jane – manager of MuscleHub) = Does the fitness test intimidate some prospective members?

Section 1 (Continued)

- To Answer Question = Set up A/B Test

Table 1: Description of Group A and B treatment

Group A	Group B
Take fitness test with personal trainer	Skip fitness test, proceed directly to application

- Hypothesis :-

Visitors assigned to group B are more likely to purchase membership to MuscleHub

Section 2: Summary of Dataset

- Initially composed of 4 separate csv files (visits, finess_tests, applications, purchases)
- 4 datasets filtered based on visit_date >=7-1-17, and assigned appropriate test_group

Table 2: First 5 rows of Combination of Datasets and Data Treatment

	first_name	last_name	gender	email	visit_date	fitness_test_date	application_date	purchase_date	ab_test_group	is_application
0	Kim	Walter	female	KimWalter58@gmail.com	7-1-17	2017-07-03	None	None	A	No Application
1	Tom	Webster	male	TW3857@gmail.com	7-1-17	2017-07-02	None	None	A	No Application
2	Edward	Bowen	male	Edward.Bowen@gmail.com	7-1-17	None	2017-07-04	2017-07-04	B	Application
3	Marcus	Bauer	male	Marcus.Bauer@gmail.com	7-1-17	2017-07-01	2017-07-03	2017-07-05	A	Application
4	Roberta	Best	female	RB6305@hotmail.com	7-1-17	2017-07-02	None	None	A	No Application

Section 2: Continued

- 5004 entries in final dataframe
- Number of visitors in each test group roughly equal

Table 3: Number of Visitors in Each Test Group

	ab_test_group	count
0	A	2504
1	B	2500

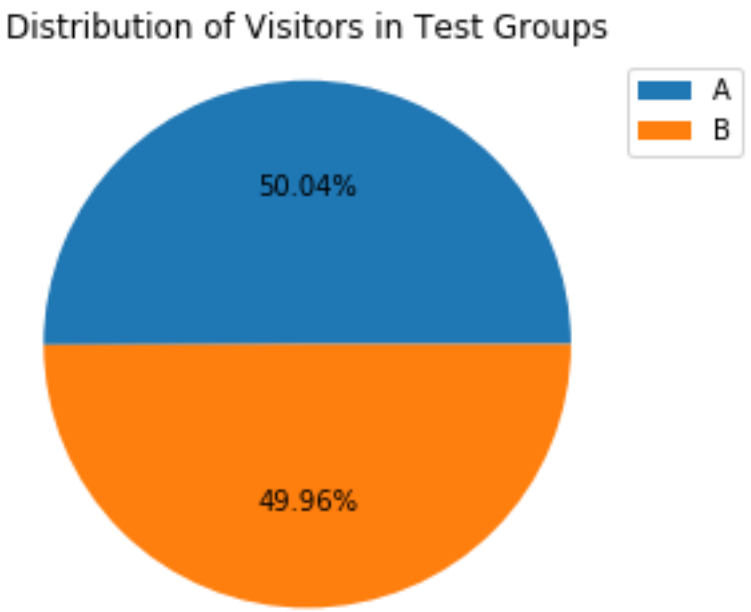

Figure 2: Distribution of Visitors in Each Test Group

Section 2 (Continued)

- Number & Percent of Applications for each test group:-

Table 4: Number & Percent of Visitors who Apply for a Membership

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

- Is this difference in percent of visitors who apply statistically significant?

Section 2 (Continued)

- Number & Percent of Membership purchased (once picked up application) for each test group

Table 5: Number & Percent of Applicants who Purchase a Membership

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

- Is this difference in percent of applicants who purchase a membership statistically significant?

Section 2 (Continued)

- Number & Percent of Membership purchased (for all visitors) for Each Group

Table 6: Number & Percent of Membership Purchased by Visitors

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

- Is this difference in percent of visitors who purchase a membership statistically significant?

Section 3 – Results of Hypothesis Test Ran

- Method = Perform a significance test
  1. Form appropriate null and alternative hypothesis
  2. Decide on appropriate hypothesis test. Significant p-value set at 0.05.

Test Type Used for All Hypothesis Testing & Reasoning

- Test type = Chi-Square test
- Reasoning = Have 2 categorical datasets to compare
- Method = Form contingency table and perform Chi-Square Test

Section 3.1 – Hypothesis test 1: Difference in Application Percentage

Table 7: Number & Percent of Visitors who Apply for a Membership

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

- Is this difference in percent of visitors who apply statistically significant?
- Null hypothesis
  - Difference in percent of visitors who apply is due to chance
- Alternative hypothesis
  - Difference in percent of visitors who apply is not due to chance

Result

- p-value = ~ 0.001 (significant)
- Reject null hypothesis, accept alternative hypothesis

Difference in application percentage between group A and B is not due to chance

Section 3.2 – Hypothesis test 2: Membership Purchase

Table 8: Number & Percent of Applicants who Purchase a Membership

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

- Is this difference in percent of applicants who purchase a membership statistically significant?
- Null hypothesis
  - Difference in percent of applicants who purchase a membership is due to chance
- Alternative hypothesis
  - Difference in percent of applicants who purchase a membership is not due to chance

Result

- p-value = 0.433 (not significant)
- Accept null hypothesis, reject alternative hypothesis

Difference in percent of applicants who purchase a membership is due to chance

Section 3.3 – Hypothesis test 3: All Visitors Musclehub

Table 9: Number & Percent of Membership Purchased by Visitors

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

- Is this difference in percent of visitors who purchase a membership statistically significant?
- Null hypothesis
  - Difference in percentage of percentage of visitors who purchase a membership is due to chance
- Alternative hypothesis
  - Difference in percentage of percentage of visitors who purchase a membership is not due to chance

Result

- p-value = 0.015 (significant)
- Reject null hypothesis, accept alternative hypothesis

Difference in percentage of percentage of visitors who purchase a membership is not due to chance

Section 4 – Summary of Qualitative Data
Section 4.1 – Percent of Visitors who apply

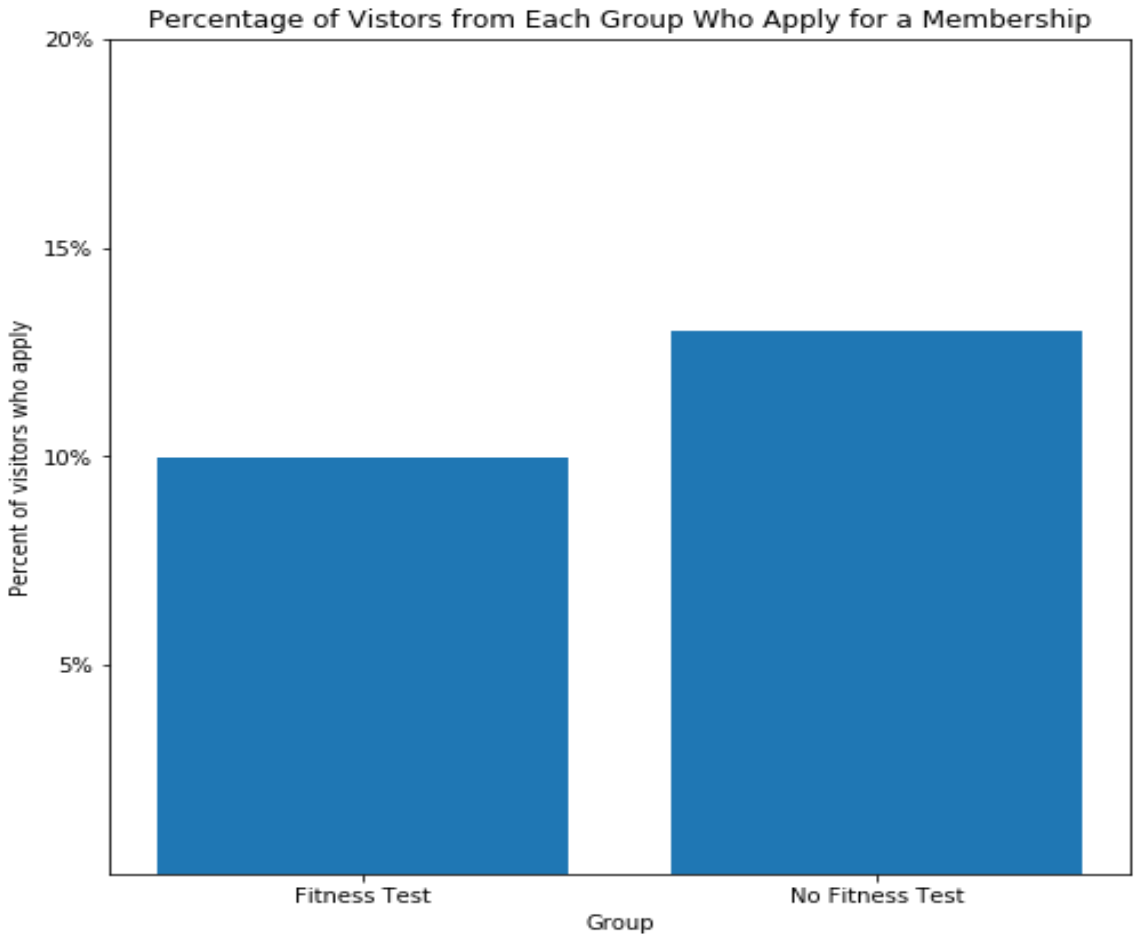

Figure 3: Percent of Visitors Who Apply for a Membership

Section 4.2 – Percent of Applicants who Purchase a Membership

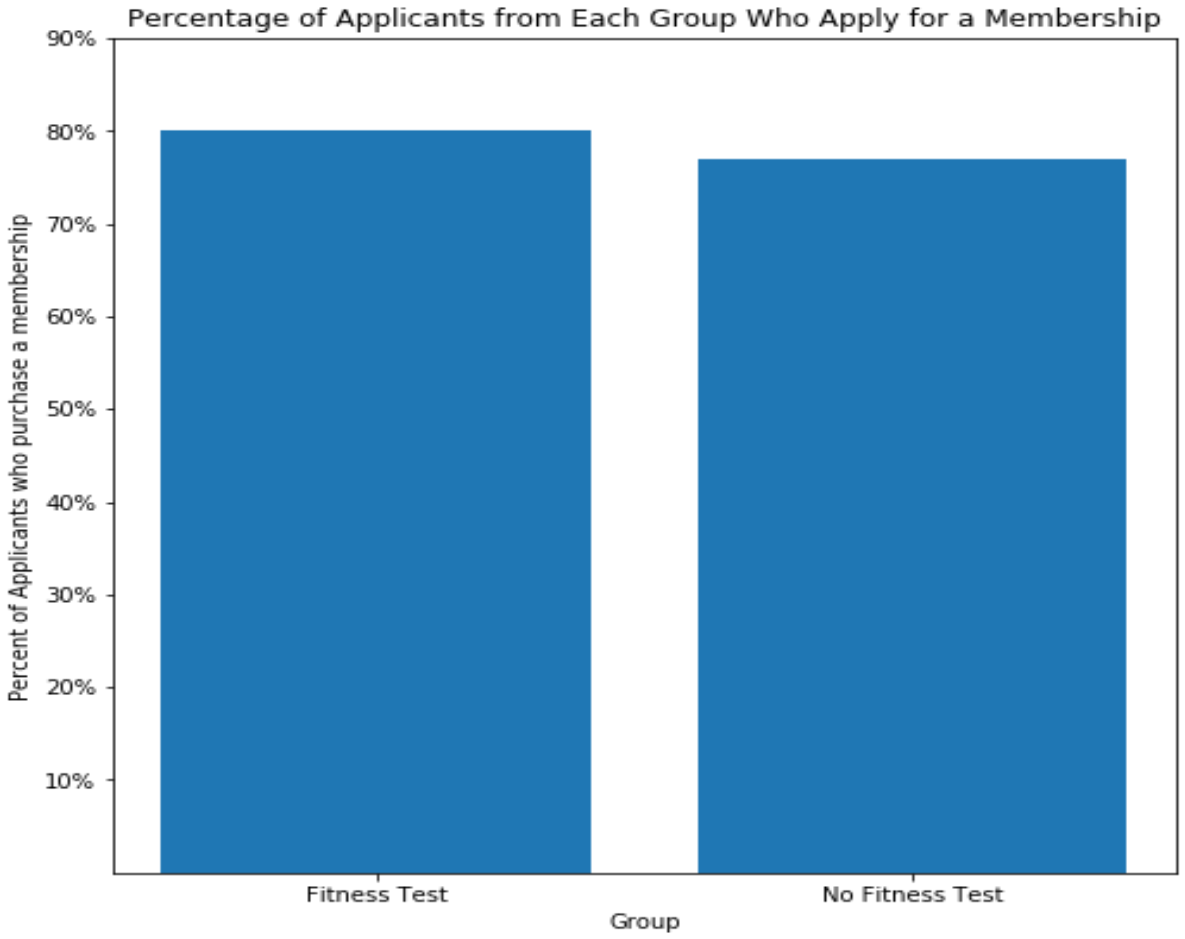

Figure 4 – Percent of Applicants who Purchase a Membership

Section 4.3 – Percent of Visitors who Purchase a Membership

Figure 5: Percent of Visitors who Purchase a Membership

Section 5 – Recommendations for MuscleHub

- The fitness test with the personal trainer does have an effect on the number of application submitted (p-value < 0.05) , while there is no difference in membership recruitment after this stage (p-value > 0.05)
- To improve membership recruitment numbers, the fitness test should be removed from the process or only made available upon request by applicant who are interested in it