MUSCLEHUB

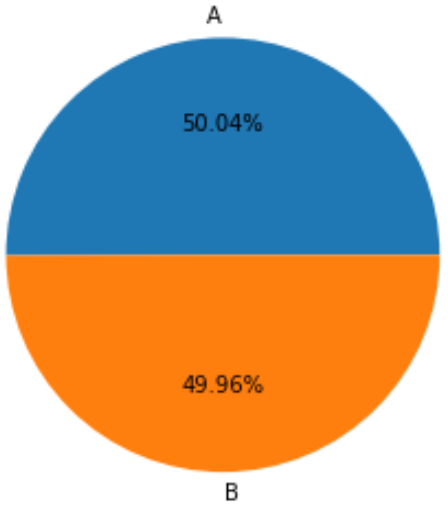
A/B TEST

What happened in the A/B test

- Downloaded the data after 7-1-17 with a series of left joins and assigned it to the *df* variable.
- With pandas we manipulate the data frame:
  - We add a column that assigns 'A' to the visitors that specify a fitness test date, 'B' otherwise.
  - We count the number of A and B visitors
- Furthermore, we create three contingency tables to compare the groups A and B with:
  - Whether an application was filled or not;
  - Whether a membership was purchased, given an application was filled;
  - Whether a membership was purchased, given someone enters the gym;
- This was done by adding a column specifying the relevant comparison attribute, grouping by such attribute and A and B, and then pivoting the data frame accordingly.
- Finally, a Chi-Square test was conducted to test for independence.

Dataset

- The dataset is composed of 5004 visitors that are randomly assigned to groups A or B.
- All visitors entered the gym after 7-1-17, which is when the experiment was initiated.
- We describe each visitor through the attributes of: first name, last name, visit date, gender, and email. Furthermore, if applicable we have information on: fitness test date, application date, and purchase date. If a visitor does not have such attributes, a ‘null’ value is assigned.
- As seen on the right, we have a balanced sample of visitors belonging to A (50.04%) and B (49.96%) groups.



Hypotheses I

H0: Taking a fitness test (group A or B) and filling an application form is independent.

H1: Taking a fitness test (group A or B) and filling an application form is not independent.

Test: Chi-square test.

Reasoning: A simple random sampling method was used, the variables are categorical, and the data is displayed in a contingency table.

P-value: 0.000964

Conclusion: At a 5% significance level, we reject the null hypothesis, and thus conclude that taking a fitness test is related to a visitor filling an application form later.

Hypotheses II

H0: For visitors that filled an application, having taken a fitness test previously (group A or B) and purchasing a membership, is independent.

H1: For visitors that filled an application, having taken a fitness test previously (group A or B) and purchasing a membership, is not independent.

Test: Chi-square test.

Reasoning: A simple random sampling method was used, the variables are categorical, and the data is displayed in a contingency table.

P-value: 0.433

Conclusion: At a 5% significance level, there is not enough statistical evidence to reject the null hypothesis. Therefore, for the visitors that filled an application, having taken a fitness test previously does not relate to purchasing a membership.

Hypotheses III

H0: Taking a fitness test (group A or B) and purchasing a membership is independent.

H1: Taking a fitness test (group A or B) and purchasing a membership is not independent.

Test: Chi-square test.

Reasoning: A simple random sampling method was used, the variables are categorical, and the data is displayed in a contingency table.

P-value: 0.0147

Conclusion: At a 5% significance level, there is not enough statistical evidence to reject the null hypothesis. Therefore, taking a fitness test does not relate to purchasing a membership.

Interviews

Four visitors from the dataset where interviewed. In summary:

- Two interviewees signed up for the gym because they did not have to take the ‘intense’ fitness test required from the other gyms they considered.
- On interviewee did not sign up for the gym due to the fitness test.
- One interviewee signed up for the gym, and considers the fitness test as a motivational factor.
- Overall, it seems like the potential customers do not sign up to a gym because they consider the fitness test too intense.
- A fast sign-up process is appreciated by visitors.
- Finally, it is interesting to note that although one interviewee was pleased not to do the fitness test, she did not sign up for the gym due to hygiene factors.

Recommendation

From the hypothesis tests, it is concluded that belonging to group A or B is related to whether a visitor fills an application form. From the graph on the right, one can further observe that not taking a fitness test results in more applications. Furthermore, taking a fitness test (or not) is not related to whether a visitor eventually purchases a membership. Finally, from the graph on the right, one can observe that the conversion from applicant to member is high (just under 80%). The difference between groups A and B is minimal when considering applicants, but becomes more noticeable (although not statistically significant) when considering visitors. This is attributed to the fact that there is higher conversion from visitor to applicant when no fitness test is required.

When interviewing visitors, it also becomes clear that a fitness test is too intense, which results in not filling in an application. Therefore, all together, requiring a fitness test from applicants, negatively affects the amount of applications for a membership.

The recommendation for Musclehub is to eliminate the fitness test in the acquisition process. Since some customers still benefit from the fitness test, it can be incorporated after the membership was purchased, and it should be targeted to customers that consider personal training. The acquisition process should be fast (since customers seem to appreciate this), and the focus should be on customer service. Finally, Musclehub should further investigate into the hygiene issues raised by an interviewee.