Testing changes related to the introduction of an improved recommender system in the online store

Project status: *completed*

Libraries used: `pandas`, `matplotlib`, `numpy`, `datetime`, `sys`, `requests`, `scipy`, `math`

Description of the project:

We have a dataset with user actions, a technical task and several auxiliary datasets at our disposal.

Technical task:

- Test name: `recommender_system_test`;
- Groups: `A` (control), `B` (new payment funnel);
- Launch date: `2020-12-07`;
- New user recruitment stop date: `2020-12-21`;
- Stop date: `2021-01-04`;
- Audience: 15% of new users from the `EU` region;
- Purpose of the test: testing changes associated with the introduction of an improved recommender system;
- Expected number of test participants: 6000.
- Expected effect: within 14 days from the moment of registration in the system, users will show an improvement in each metric by at least 10%:
    - conversions to view product cards — `product_page` event;
    - cart views — `product_cart` event;
    - purchases — `purchase` event.

Our task is to evaluate the results of the A/B test:

1. Evaluate the correctness of the test. For this we need to check:
    - intersection of the test audience with a competing test;
    - coincidence of the test and marketing events, other problems of time limits of the test.
2. Analyze the test results.

The study will take place in three stages:

1. Data review and data preprocessing.
2. Evaluation of the correctness of the test and exploratory data analysis.
3. A/B test analysis.

Conclusions on the project:

Comparison of the results of group B with group A separately for each event showed that *there are statistically significant differences* between the proportions of users who made events in each group.
Expected effect: in 14 days from the moment of registration in the system, users will show an improvement of each metric by at least 10% is not achieved.

Thus it can be assumed that in general, the changes associated with the introduction of an improved online store recommendation system, has a strong influence on user behavior. Also, perhaps, incorrect division into groups, user participation in several tests at once, marketing campaigns conducted on test dates.