I was given 2 datasets consisting of a list of users who signed up for the product in the last 2 years and their engagement when they logged into the product. The goal is to find what are the features that make a user adopt the product. The definition of adopted user is a user who logged into the product on three separate days in at least one seven-day period.

Dataset
The dataset is separated into 2:
1. *takehome_user_engagement.csv*
   ○ 12,000 unique users
   ○ contains null values in *last_session_creation_time* and *invited_by_user_id*
2. takehome_users.csv
   ○ 207,917 rows of unique login by user_id

Data Cleaning
The null input in the takehome_user_engagement.csv is replaced by 0.

Exploratory Data Analysis (EDA)
Some insights that can be drawn from the dataset:
- 24.95% of users subscribed to the mailing list
- 14.93% of users are on the regular marketing email drip
- 53.47% of users are referred
- Top 10 of users belong to the organization id 0 to 10 except 8
- Most users are from ORG_INVITE followed by GUEST_INVITE

Predictive Modeling
For this project, I use RandomForestClassifier since it is a classification problem. The dataset is separated into data and labels (adoption) and split into training vs test dataset with a ratio of 30%. By using out-of-the-box setup, the model has an accuracy of 83.58%.

I did a hyper-parameter tuning for the model and it improves the accuracy to 86.94%.

Feature Importance
By using the model, the top 3 features that are important for user adoption are:
1. Signed up for the product from PERSONAL_PROJECTS
2. Belongs to org_id 0
3. Signed up for the product from SIGNUP_GOOGLE_AUTH

From the lists above, it is recommended that Relax Inc. focus heavily on pushing their users to invite new users to use their products. An incentive should be in place to encourage it. Since we also see that SIGNUP_GOOGLE_AUTH is one of the top factors for adopted users, they should work to make signing up to be streamline probably by adding other authentication login such as Facebook, Twitter and other social media platforms. As for org_id, I do not have enough information to have any recommendations.