

## Relax Inc User Adoption Analysis – Take-Home Exercise

### Objective:

Identify which user attributes predict future user adoption, where an adopted user is defined as one who logs into the product on three separate days within any seven-day period.

### Approach:

Using the provided datasets, I labeled each user as adopted or not adopted based on login activity from *takehome\_user\_engagement*. This label was merged with signup-time attributes from *takehome\_users*. I analyzed adoption rates across user characteristics and trained a simple Random Forest model to confirm relative feature importance. Full code and analysis are provided in the attached notebook (*takehome\_user.ipynb*).

### Key Findings:

- Overall adoption rate: ~18.7% of users meet the adoption definition, indicating that sustained engagement is achieved by a minority of users.
- Account creation source is the strongest predictor of adoption. Users who join via Guest Invites or Google Authentication show the highest adoption rates (~23%), while users invited to Personal Projects have substantially lower adoption (~11%). This suggests that social context and low-friction onboarding pathways are important drivers of adoption.
- Invitation status matters, but modestly. Invited users adopt at a higher rate (20.0%) than non-invited users (17.2%), indicating a positive but moderate social effect.
- Marketing emails have limited impact. Both marketing drip enrollment and mailing list opt-in show only marginal differences in adoption rates, suggesting weak influence on sustained engagement.

### Modeling Results:

A simple Random Forest model trained on signup-time features achieved modest predictive performance ( $AUC \approx 0.57$ ). Feature importance confirms exploratory results: *creation source* and *invitation status* are the most informative predictors, while marketing-related features contribute little. The model primarily serves to validate observed patterns rather than optimize prediction accuracy.

### Conclusion:

User adoption is most strongly associated with how users are introduced to the product, particularly invitation-based and socially contextualized signup paths. Marketing emails alone do not meaningfully predict sustained usage. These findings suggest that improving early onboarding and collaborative context may be more effective than increased marketing outreach.