**Answers to the Questions asked in the Case Study**

1. **What percentage of users opened the email and what percentage clicked on the link within the email?**

**Email Open Rate:** ~10.35%

**Click-Through Rate (CTR):** ~2.12%

These are calculated from all users who received the email, with open and click status tracked accordingly.

1. **The VP of marketing thinks that it is stupid to send emails in a random way. Based on all the information you have about the emails that were sent, can you build a model to optimize in future how to send emails to maximize the probability of users clicking on the link inside the email?**

To replace the random strategy, a two-stage machine learning model was developed:

* Stage 1: Predicts the probability a user will open the email (P(open))
* Stage 2: Predicts the probability of clicking if the email is opened (P(click | open))
* Final Output: P(click) = P(open) × P(click | open)

This enables the marketing team to simulate and score various combinations of recipients, timing, and content to maximize click probability.

1. **By how much do you think your model would improve click through rate (defined as # of users who click on the link/total users who receive the email). How would you test that?**

* Baseline CTR (random): ~2%
* Predicted CTR (top 5% scored users): ~13% (approx.)

This suggests up to 6x higher CTR by targeting only users most likely to engage.

How to validate:

* Run an A/B test comparing model-based targeting vs. random assignment
* Measure actual CTR and conversion between groups

1. **Did you find any interesting pattern on how the email campaign performed for different segments of users? Explain.**

Segmentation Analysis was carried out in EDA which helped me uncover various patterns :-

* Email Content:
  + Short + Personalized emails had higher click and open rates than long or generic ones.
* Timing:
  + Best engagement occurred on weekdays (especially Tuesday to Thursday), during working hours (9 AM–6 PM)
* User Behaviour:
  + Users with past purchases > 5 were significantly more likely to click.
* Geographic Trends:
  + Users from the US and UK responded better than other regions.