A/B Testing

- Implementation in Python -

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IMPLEMENTATION

Dataset: “Online Learning Platform - Email Engagement Campaign”

Context

You're working with an online learning platform that offers various courses and certifications. The goal of this A/B test is to increase user engagement by testing two types of email subject lines aimed at encouraging users to return to the platform and resume a course they previously enrolled in.

Objective of the A/B Test

Analyze which email subject line variant results in a higher:

- Click-through rate (CTR)
- Conversion rate (resuming the course)

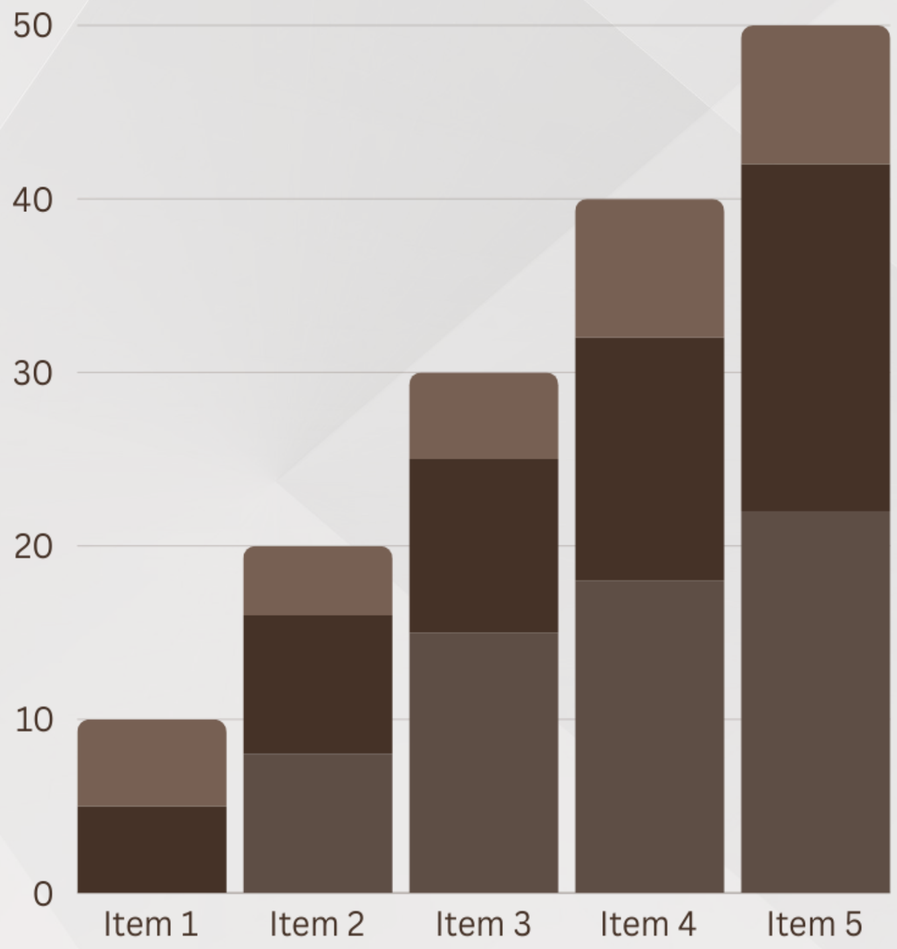
IMPLEMENTATION

Data Structure

1. User ID: Unique identifier for each user.
2. Age: Age group (e.g., 18-25, 26-35, etc.) of the user, which could impact engagement levels.
3. Enrollment Type: Whether the user enrolled for a free trial or paid subscription.
4. Course Category: The category of the course enrolled in (e.g., Data Science, Marketing, Design).
5. Previous Engagement Level: Historical data indicating low, medium, or high engagement based on past actions.

Data Structure

6. Email Variant (A/B): The variant of the subject line used for each user (e.g., "Variant A: 'Complete Your Course in Record Time!' " or "Variant B: 'Your Learning Journey Awaits - Resume Now!'").
7. Click-Through Rate (CTR): Whether the user clicked the email (0 for no, 1 for yes).
8. Conversion Rate: Whether the user resumed their course after opening the email (0 for no, 1 for yes).



RESULT

Here are the results of the A/B test analysis:

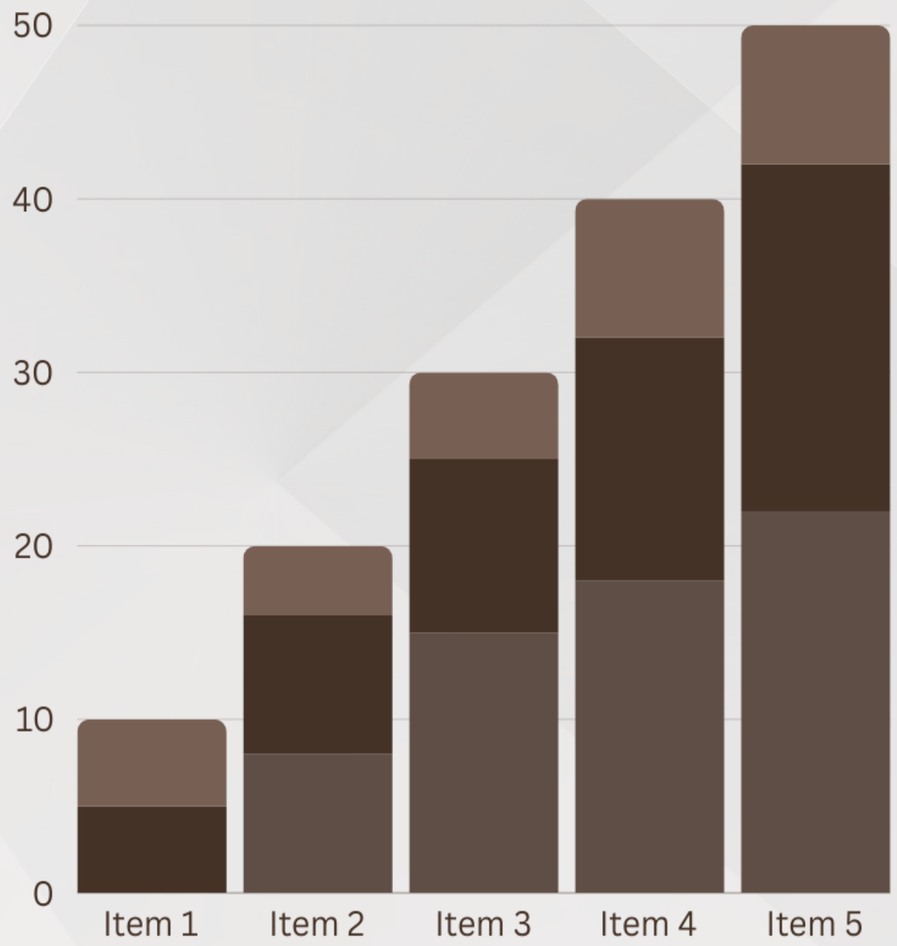
A/B Testing Results Using T-Test:

Click-Through Rate T-Test: t-statistic = -2.654, p-value = 0.008

Conversion Rate T-Test: t-statistic = -1.880, p-value = 0.060

The difference in Click-Through Rates between variants A and B is statistically significant.

The difference in Conversion Rates between variants A and B is not statistically significant.



RESULT

Here are the results of the A/B test analysis:

A/B Testing Results Using Chi-Square Test:

Variant A: CTR = 0.379 Conversion_Rate = 0.094

Variant B: CTR = 0.399 Conversion_Rate = 0.094

Click-Through Rate p-value: 0.559 (not statistically significant)

Conversion Rate p-value: 1.0 (not statistically significant)

RESULT

Slice data by user demographics (age & enrollment type) to see if certain groups respond better to one email variant over another

T-Test:

Take a look at the .ipynb file.

Chi-Square Test:

Take a look at the .ipynb file.

CODE

The following is the implementation of A/B Testing code in Python:

Full Code : Click Here

THANK YOU

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