# A/B Test

## 1. Metrics

Key Performance Metrics: We chose the conversion rate as the percentage of visitors who complete a desired action such as making a purchase or signing up for a newsletter. This directly ties into our objective of enhancing user engagement and satisfaction.

Justification for Selection: We selected this metric because it allows us to measure the effectiveness of personalized recommendations in encouraging decisive user actions, which is crucial for our strategy in women’s fashion athletic wear.

Alignment with Objectives: A higher conversion rate in the experimental group would validate our hypothesis that personalized recommendations significantly boost user engagement, contributing directly to increased revenue and customer satisfaction.

## 2. Hypotheses

Null Hypothesis (H0): Personalized recommendations do not increase user engagement compared to generic recommendations.

Alternative Hypothesis (H1): Personalized recommendations result in higher user engagement compared to generic recommendations.

## 3. Experimental Design

Control and Experimental Groups: We will compare user experiences between two groups; the control group will see standard product recommendations while the experimental group receives personalized product recommendations generated by an AI algorithm.

Randomization Process: We will implement a JavaScript-based randomization mechanism on our site to ensure unbiased group assignment and consistent user experience.

Experiment Duration: We determined a 4-week testing period to allow for sufficient data collection and reliable analysis.

Sample Size Calculation: We calculated the need for approximately 500 users per group based on desired test power and significance levels to detect meaningful differences.

## 4. Implementation Plan

Technical Setup: We will set up our A/B testing environment using specific tools such as LaunchDarkly to manage feature flagging and user segmentation.

Timeline: Our timeline spans from preliminary setup to final reporting, accounting for potential adjustments based on initial findings.

Ethical Considerations: We are committed to transparency and will ensure all participants are informed about how their data is used in our tests, maintaining ethical standards throughout.

## 5. Data Collection and Analysis

Tools and Techniques: We will use advanced tools like Google Analytics to segment user data and track interactions, enhancing our dashboards with real-time updates.

Analytical Methods: We will employ statistical software like R and Python to perform rigorous data analysis, setting our alpha level at 0.05 to ensure significance.

Interpretation of Results: We will interpret our results by considering statistical outputs such as p-values and confidence intervals, allowing us to make informed decisions based on the test outcomes.