

AB-Test Code Challenge

The A/B Testing System developed for this project represents a sophisticated approach to optimizing user experience through controlled experimentation. This exposition aims to delineate how the system fulfills its core objectives.

Random Variation Assignment

Upon visiting the webpage, each visitor is exposed to one of two variations, A or B, assigned randomly. This randomness is crucial for the integrity of the A/B test, ensuring that each variation's performance is evaluated under comparable conditions. The assignment mechanism is encapsulated within the `composables/guest.ts` file, where the `variantLetter` variable determines the variation a visitor receives:

```
const variantLetter = Math.random() > 0.5 ? 'A' : 'B';
```

Persistence of Assigned Variation

To maintain consistency in the user experience and the integrity of the test results, the assigned variation remains unchanged for each visitor throughout their session, even after page reloads. This persistence is achieved through the use of cookies, as demonstrated in the `composables/guest.ts`, ensuring that the user's interaction with the same variation is consistent:

```
const guest_ = useCookie<Guest>('guest_ab');
```

Pageview Tracking

Every visit to the page triggers a pageview tracking event, leveraging the `analytics-api.ts` method. This tracking is vital for analyzing user engagement with each variation and constitutes a foundational element of the test's analytical framework. The tracking logic is implemented in the `pages/index.vue` file, as shown below:

```
onMounted(() => { $trackPageview(guest_); });
```

Event Tracking for 'Sign Up' Button Clicks

When a visitor interacts with the “Sign Up” button, an event is tracked via the `analytics-api.ts` method. This action represents a critical conversion metric, directly correlating with the effectiveness of the presented variation. The event tracking mechanism, detailed in the `components/Signup.vue`, underscores the system’s capacity to capture and analyze user actions:

```
const handleClickSignup = () => { $trackEvent(guest_, event); };
```

Comprehensive Tracking

The system is designed to meticulously track every page view and “Sign Up” button click, aggregating data essential for a nuanced analysis of user behavior. This comprehensive tracking framework is instrumental in evaluating the variations' performance, underpinning the strategic insights derived from the A/B test.

Determining the Winning Variation

The ultimate goal is to identify the winning variation by comparing the CTR of the “Sign Up” button clicks. The CTR, defined as the ratio of clicks to page views, is calculated uniquely for each user to ensure that repeated actions by the same visitor are appropriately accounted for. This approach addresses the challenge of accurately assessing the variations' impact on conversion rates. The data architecture, as instantiated in the tracking logic, facilitates this analysis by distinguishing between unique and repeat interactions.

The implementation ensures that a user, irrespective of the number of clicks or page reloads, is counted only once in the conversion metric. This methodology is reflected in the decision to leverage session storage for tracking unique page views and employing logic to prevent duplicate event tracking, as evidenced in the `analytics-api.ts` and session handling within the `“index.vue”`.

Easy Content Edition

Content editors can easily edit the JSON-formatted text used in `i18n` (internationalization) to make modifications without the need for developer assistance. This allows for straightforward changes to be made independently.

In summation, the A/B Testing System's architecture is meticulously crafted to support a robust analytical examination of two webpage variations. Through random assignment, persistent tracking, and sophisticated data analysis, the system provides a comprehensive framework for evaluating and enhancing user experience.