Responsive Design

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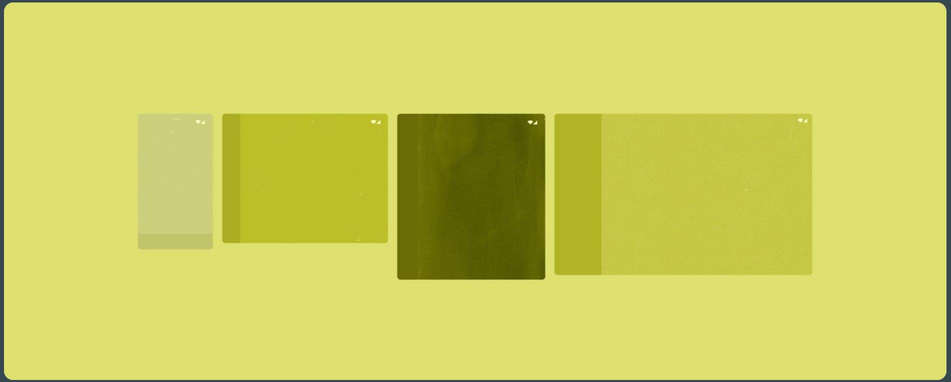
Why do we need a responsive design?

- A responsive design is an approach to make apps adapt to different screen sizes, orientations, and layouts
- By supporting for different screen sizes, it enables your app to be accessed by the widest variety of users and a greatest number of users



Responsive Design vs Adaptive Design

Responsive Design - Automatically adjusts to changes in screen resolution and aspect ratio (The app rearranges itself based on the detected screen size).

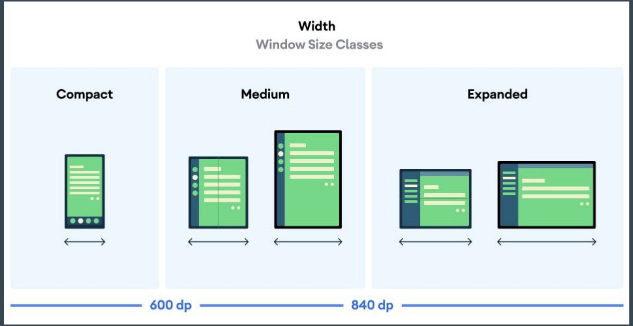
Adaptive Design - Selects the most appropriate layout for the screen size (Predetermined for different screen sizes). Adaptive design layouts are more labor intensive because they need to hard code different designs based on varying screen lengths.

Architecture

Declarative UI: Compose's declarative approach makes it easier to create dynamic, responsive layouts. (focuses on defining the UI's desired end state and lets the framework handle the actual rendering and state transitions)

State-driven UI: Layout changes are driven by state, which can be derived from window size classes or other factors.

Layered approach: Screen size logic is confined to a single location, producing state that is passed down to nested composables



Tools and techniques for creating adaptive layouts:

WindowSizeClass: This API categorizes screen sizes into Compact, Medium, and Expanded classes for both width and height, allowing developers to make layout decisions based on available space rather than specific device characteristics.

BoxWithConstraints: This composable function allows access to the current width and height of a layout, enabling dynamic adjustments based on available space.

ConstraintLayout: A powerful layout manager that allows creation of complex, flexible layouts that can adapt to different screen sizes.

Modifier.weight: This modifier helps specify how available space should be distributed among components, facilitating responsive designs

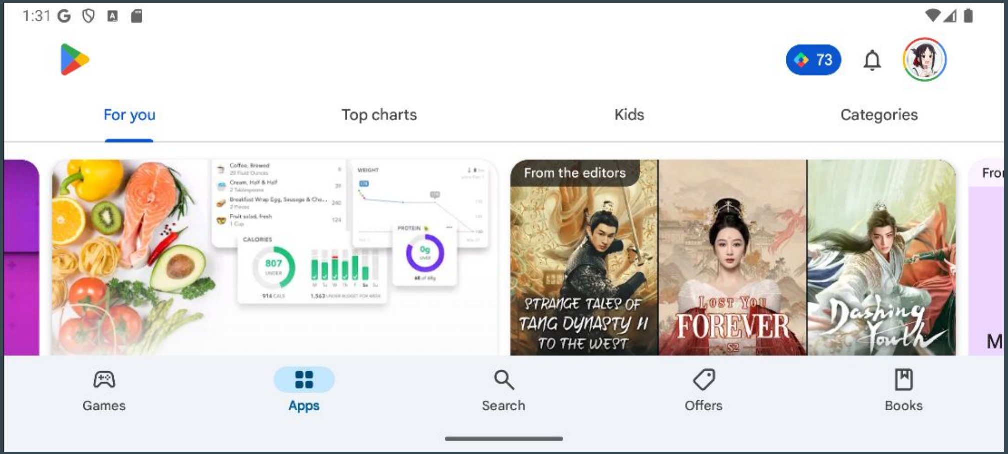
Why use WindowSizeClass?

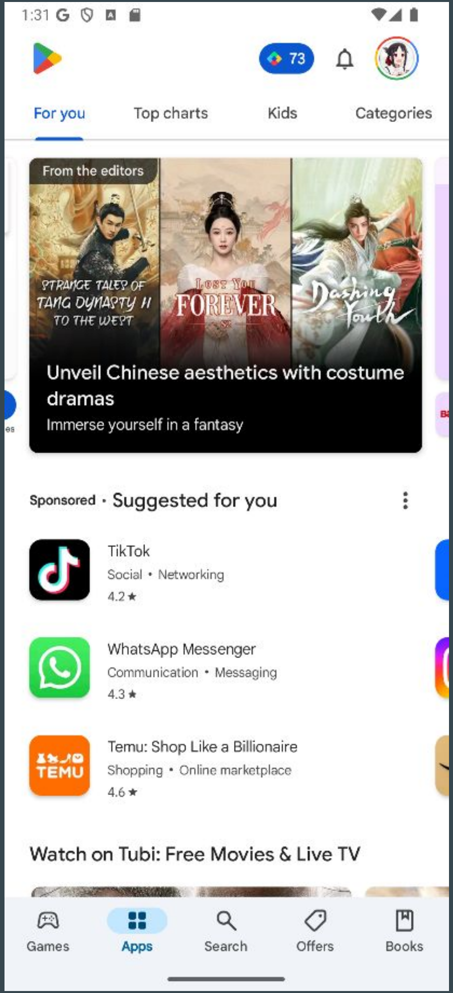
Sometimes the available screen space do not correspond to fixed tangible values (e.g. is the device a tablet?).

Window size classes are explicitly not determined by the size of the device screen. Rather, window size classes are determined by the window size available to your application regardless of the type of device the app is running on

Google Play Store Responsive Design Analysis

The Google Play Store uses a flexible layout that adapts to different screen sizes and orientations. They nest LazyRows/LazyGrids inside of their main LazyColumn layout which displayed the categories. And within each category you have a horizontally scrollable rows, representing a category or collection of apps.

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Responsive Design in Google Play Store

This structure allows for:

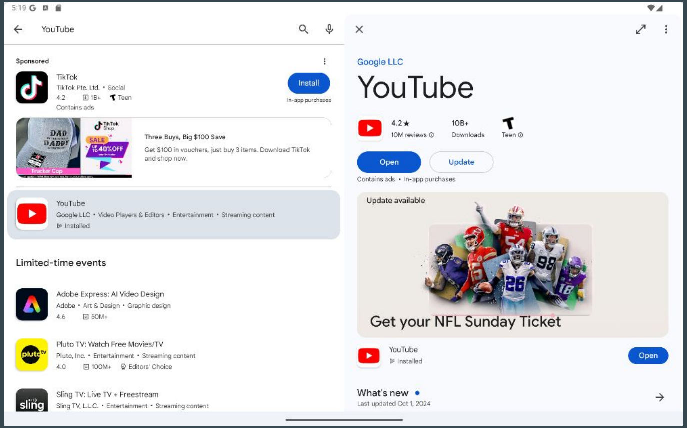
1. Vertical scrolling through different categories.
2. Horizontal scrolling within each category.
3. Efficient loading and recycling of views, as both LazyColumn and LazyRow/LazyGrids only render visible items.

Key aspects of this design:

1. This layout naturally adapts to different screen sizes. On wider screens, more items in the LazyRow/LazyGrids will be visible.
2. The LazyRow/LazyGrids doesn't snap to items, allowing users to see part of the next item, indicating more content is available horizontally.

Responsive Design Cont.

When holding the tablet in landscape mode, app details will show up on the right side while the search results remain on the left. This allows users to browse through search results more efficiently without going back and forth between pages, which is not possible on the phone's smaller screen.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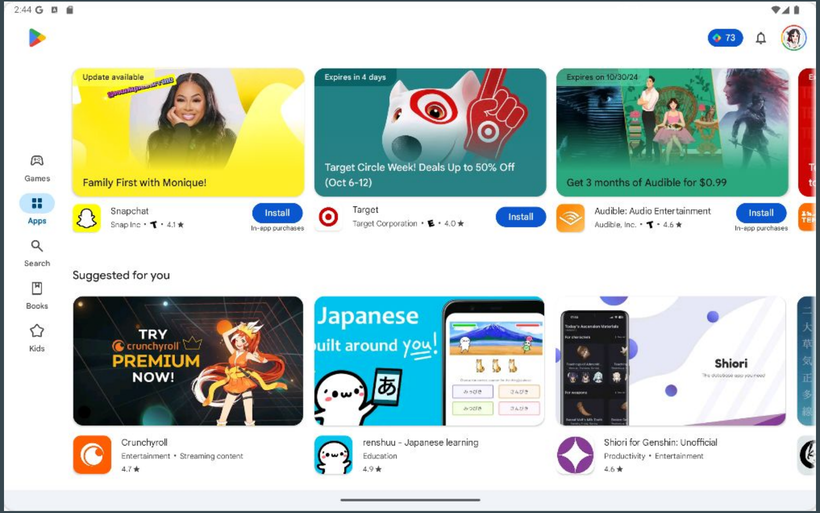
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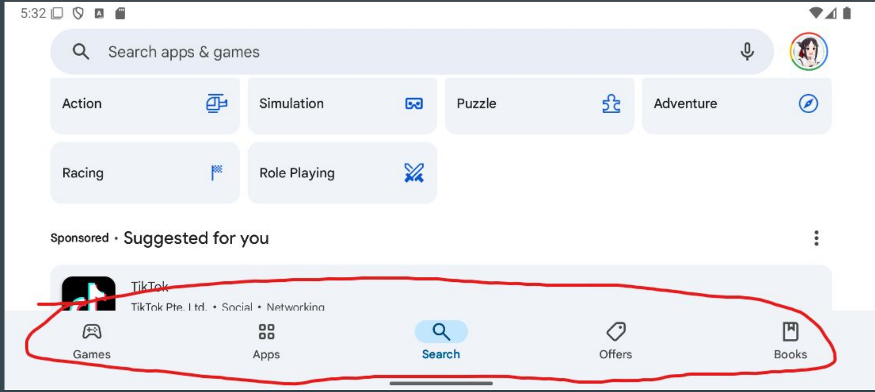
Google Play Store Critique



Performance Concerns:
With richer visual elements and more complex layouts, there might be performance issues on older or lower-end devices, especially when rapidly scrolling through content-heavy sections.

Limited Landscape Optimization for Phones:
While tablets get a split-screen search interface in landscape mode, phones in landscape orientation don't seem to have significant layout changes to take advantage of the wider aspect ratio.

Persistent Bottom Bar Trade-offs:
While the new non-disappearing bottom bar improves navigation consistency, it also permanently occupies screen space, which could be a drawback on smaller screens.

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