**Derived State**

State that is computed from another existing piece of state or props. It avoids unnecessary state variables, keeping the application logic simple and efficient e.g.

**Initial Setup**

* Three pieces of state: cart, numItems, and totalPrice.
* numItems and totalPrice are directly dependent on cart.

**Problems with Redundant State**

* Synchronization Issue: All related states need to be updated together. If cart is updated, numItems and totalPrice must be manually updated to stay in sync.
* Performance Issue: Updating these three states separately leads to three unnecessary re-renders.

**Solution: Derived State**

* Remove Redundant State: Eliminate numItems and totalPrice as state variables.
* Compute from cart

1. numItems is computed as cart.length.
2. totalPrice is computed as the sum of all prices in cart.
3. Store these computed values in regular variables, not state variables.

**Benefits**

* Single Source of Truth: cart acts as the single source of truth, ensuring all related data stays in sync.
* Efficient Re-renders: Only cart is stored in state, minimizing re-renders.

