Component Rendering and Side Effects

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When the state of a component changes it re-renders

Rendering !== Updating the browser

React element
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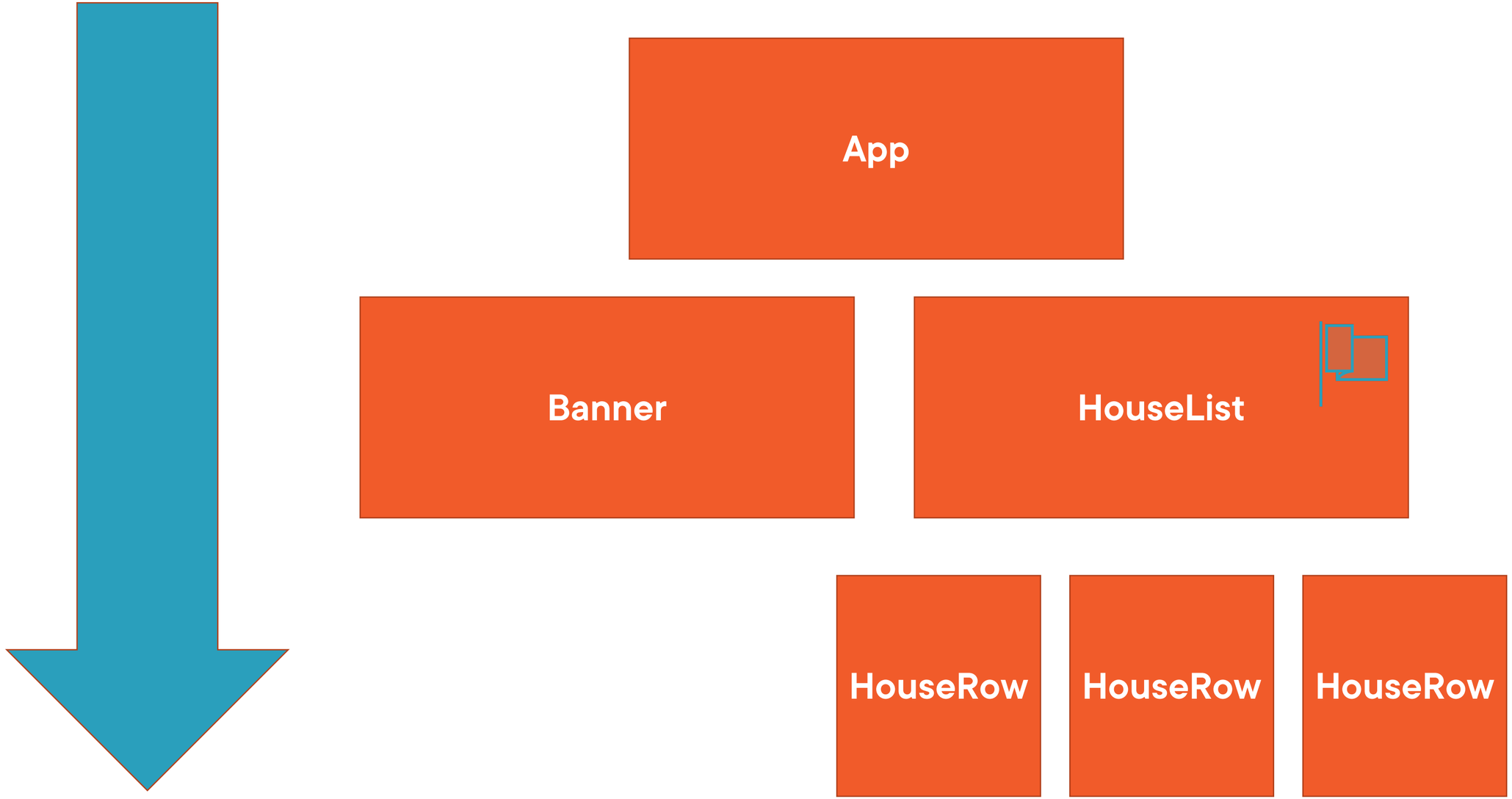
How React Keeps State

```
const [houses, setHouses] = useState(houses);
const [counter, setCounter] = useState(0);
```

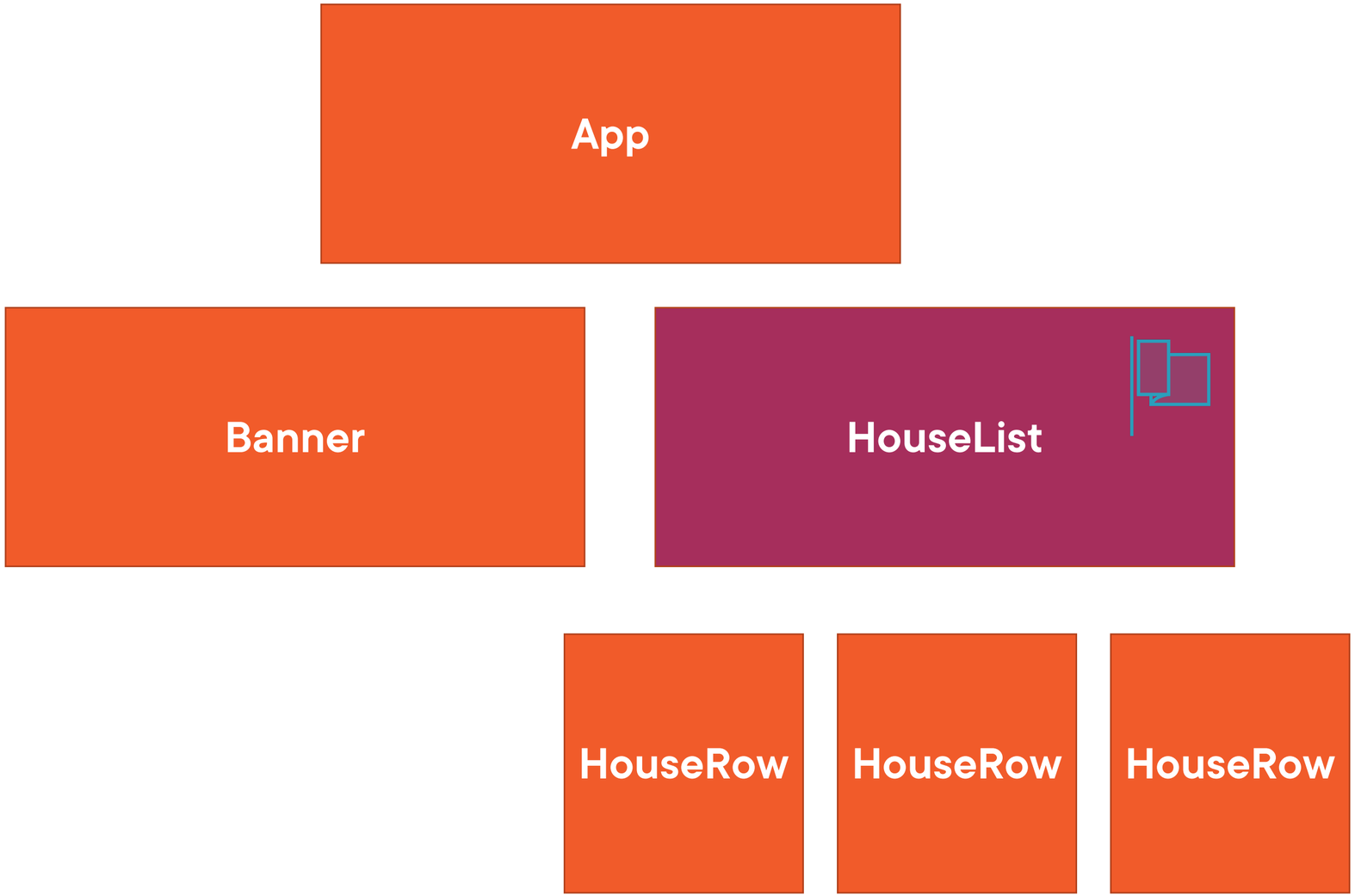
Array: [0]: [{..}, {

[1]: 42

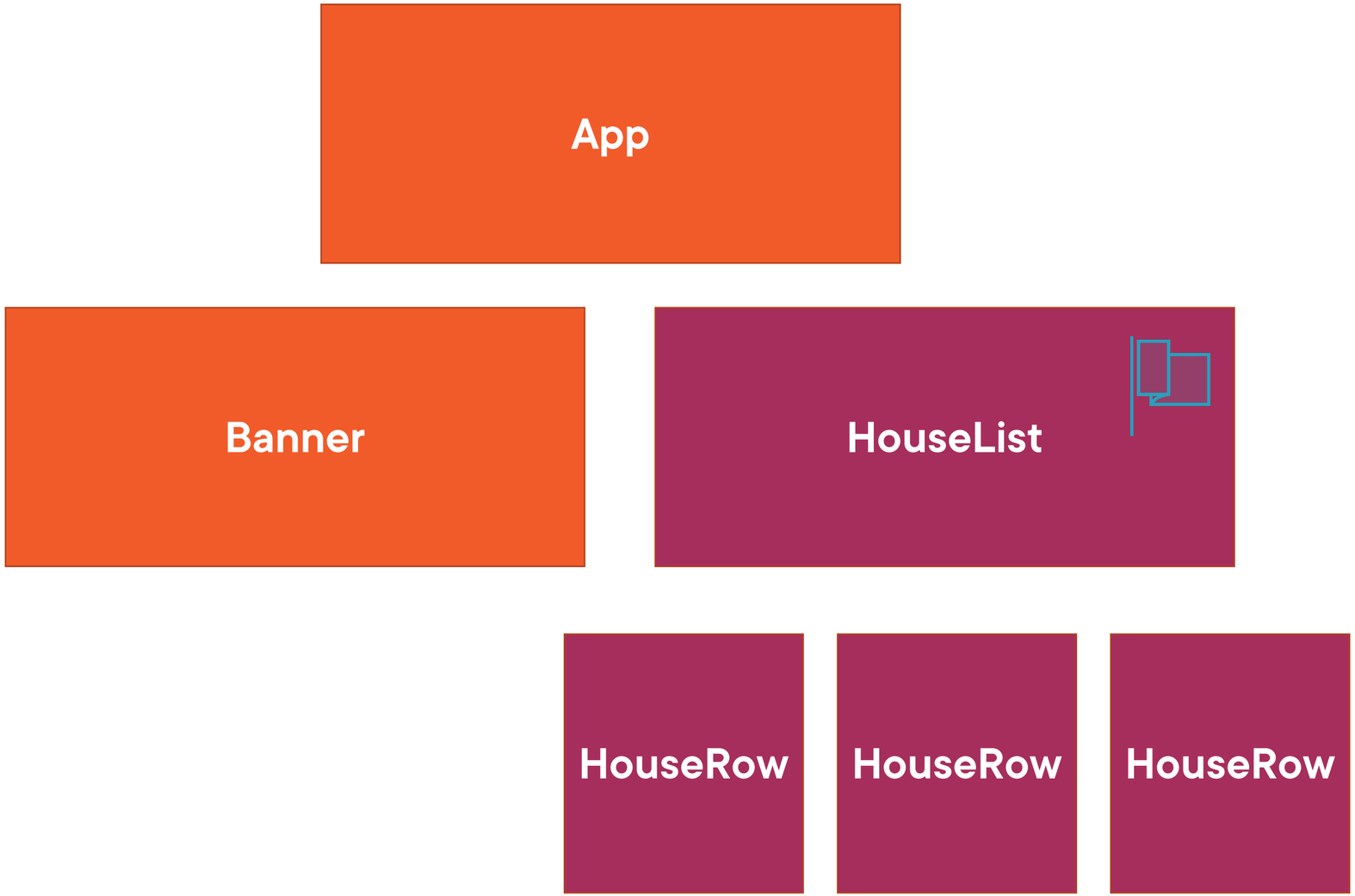
The Rendering Process



The Rendering Process



The Rendering Process



State Changes and Re-Renders

Cascading effect

Doesn't degrade performance in a well designed application

Remember reconciliation

Something to always keep in mind when designing the application

A Pure Function

```
const returnNumber = () => 42;
```

Another Pure Function

```
const add = (a, b) => a + b;
```

Pure Functions

Easy to test

Predictable

Reliable

Cacheable

Function components must be pure

When to Use React.memo

- When it's faster
- Measure
- Pure functional component
- Renders often
- With the same prop values
- JSX isn't trivial

https://reactjs.org/docs/react-api.html#reactmemo

Unpredictable operations in components should be set aside

(Side) effects

Effect Examples

API interaction

Use browser APIs (e.g. document, window)

Using timing functions (e.g. setTimeout)

The Effect Hook

```
useEffect(() => {
  //perform the effect
});
```

Effect Hook: Dependency Array

```
const [ counter, setCounter ] =
useState(0);

useEffect(() => {
  document.title = counter;
});
```

Effect Hook: Dependency Array

```
const [ counter, setCounter ] =
useState(0);

useEffect(() => {
  document.title = counter;
}, [ counter ]);
```

Optional exercise:
Persist the new house and extract the add button into a new component

Effect Hook: Separation of Concerns

```
useEffect(() => {
  document.title = counter;
}, [ counter ]);

useEffect(() => {
  //fetch from API
}, [ ]);
```

Effect Hook: Cleaning Up

```
useEffect(() => {
  //subscribe
  return () => {
    //unsubscribe
  };
}, [ ]);
```

Coming up:
The Memo and Ref hooks

Memo hook: Memoize values in components

The Memo Hook

```
const result =
  timeConsumingCalculation(houses)
;
```

The Memo Hook

```
const result = useMemo(() => {
  return
timeConsumingCalculation(houses);
}, [ houses ]);
```

Ref hook:
Persist values that survive re-renders
without causing a re-render

The Ref Hook

```
const TextInputWithFocusButton = () => {
  const inputEl = useRef(null);
  const onButtonClick = () => inputEl.current.focus();
  return (
  <>
    <input ref={ inputEl } type="text" />
    <button onClick={ onButtonClick }>Focus the input</button>
  </>
  );
};
```

Next up:

Conditional Rendering and Shared State