# Week 1

Progress

- React Basics (JSX + React) :
    - Quick Start
    - Tic-Tac-Toe
    - Thinking in React
- TypeScript Basics (TSX + React) :
    - The Basics
    - EveryDay Types (Halfway Through)
- Simple TodoLIst (with the help of Copilot on css)

## Touched Concept

React:

1. Components
2. props
3. Hooks (useState)

TS:

1. Types
2. toggle the strictness in `tsconfig.json`

## Not Yet Touched:

React:

- Other Hooks (useEffect, useReduce...)
- routing?
- data fetching?
- Rendering?

JS related:

- Async:Promise

# TypeScript vs JSX vs JS

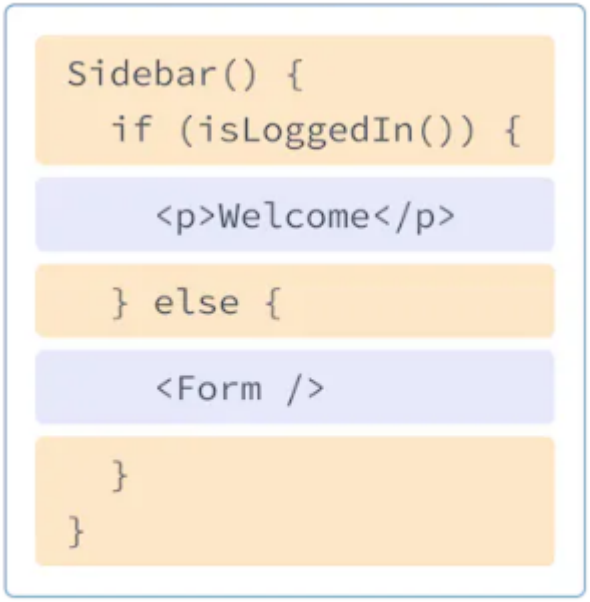
## TypeScript

- A super set of JS
- Add static typing to JS

- Then compiles to plain JS

## JSX

- a syntax extension for JavaScript that lets you write HTML-like markup inside a JavaScript




`Sidebar.js` React component

file

# React

## Components

A fundamental structure in React.

> A component is a piece of the UI (user interface) that has its own logic and appearance. A component can be as small as a button, or as large as an entire page.

```
function MyButton() {
  return (
    <button>
      I'm a button
    </button>
  );
}

export default function MyApp() {
  return (
    <div>
      <h1>Welcome to my app</h1>
      <MyButton />
    </div>
  );
```

```
}
```

## props

```
Way of passing data from parent components to child.
using {} to pass argument
```

```
export function TodoList({retrievedTaskList}: {retrievedTaskList: TaskList}){

    const [taskList, setTaskList] = useState(retrievedTaskList)
    const [filterText, setFilterText] = useState('')
    const [newTaskText, setNewTaskText] = useState('')
    const [totalTaskCount, setTotalTaskCount] = useState(retrievedTaskList.tasks
```

## Hooks (useState)

A set of different React Feature.

### State Hooks

State lets a component “remember” information like user input.

```
export function TodoList({retrievedTaskList}: {retrievedTaskList:
TaskList}){

    ...
    const [newTaskText, setNewTaskText] = useState('')
    ...
```

### Usage

Use `useState` for minimal data but complete representation of UI state.

### useState vs variables

Ref: StackOverflow When using State is changed, it'll triggered the rendering of the page, but not local variable.

Compare this examples:

```
function Foo() {
    const [a, setA] = useState(0);
    return <div onClick={() => setA(a + 1)}>{a}</div>;
}

function Foo() {
    let a = 0;
    return <div onClick={() => a = a + 1}>{a}</div>;
}
```

## Rendering

- Q: When is the html re-rendered by React (1 instance: on State Change)
- Q: Generally, what decides the latency of a webpage, What contributes a big portion of it? Like rendering?

### Rendering list in react

When a list is re-rendered, React takes each list item's key and searches the previous list's items for a matching key. If the current list has a key that didn't exist before, React creates a component. If the current list is missing a key that existed in the previous list, React destroys the previous component. If two keys match, the corresponding component is moved.

# Framworks

## Vite vs Next.js vs webpack (AI GENed)

- Vite: build tool. best suited for small to medium-sized projects that prioritize fast development and performance. It excels in building modern web applications using ES modules and native browser features.
- WebPack: build tool. It offers extensive configuration options and supports advanced features like code splitting, tree shaking, and caching.
- Next.js :full React framework which used webpack inside. provides server-side rendering (SSR) and static site generation (SSG) capabilities. It uses webpack under the hood for bundling and provides a comprehensive solution for building production-ready React applications.

# CSS

- .board-row:after : specifies the rules for the element after the current element (board-row)

# JS

## ? in JavaScript

```
parameter? : type
```

is equal to

```
parameter: type | undefined
```

## Immutability vs shallow-copy vs deep copy

Immutability: won't change the value of the original object/array.

When doing shallow-copy: The primitive type value will not be altered. But object is copied with reference and change the element in the object may lead to changes in the original object/array too.

- Objects will reflect change in the original place from where they were shallowly copied because they are stored as references (to their address in the Heap).
- Primitive data types will NOT reflect change in the original place because they are directly stored in the callstack (in Execution Contexts).

e.g.

```
let animals = ['ant', 'bison', 'camel', [1, 2]];

let t = animals.slice();

t[0] = 'aaa';    // string (primitive datatype)
t[t.length-1][0] = 0;    // array (object)

console.log(t);
console.log(animals);
```

https://stackoverflow.com/questions/47738344/does-javascript-slice-method-return-a-shallow-copy