

# PHASE 1 | Building the Basics

**Timeline:** November 17 - December 10, 2024

**Learning Focus:** TypeScript Basics + User Management CRUD Project

## *Week 1: TypeScript Basics (Nov 17 - Nov 23, 2024)*

- **Day 1 (Nov 17):**
  - **Topic:** Introduction to TypeScript
  - Learn the **benefits of TypeScript** over JavaScript.
  - **Task:** Read an introductory article or video on TypeScript.
  - **Goal:** Understand the difference between JavaScript and TypeScript, and why TypeScript is a good choice for larger projects.
- **Day 2 (Nov 18):**
  - **Topic:** Installing and Setting Up TypeScript
  - **Task:** Install TypeScript globally and in your project.
  - **Goal:** Set up your first TypeScript project with a `tsconfig.json` file.
- **Day 3 (Nov 19):**
  - **Topic:** Basic Types
  - **Task:** Learn and practice TypeScript basic types: `string`, `number`, `boolean`, `array`, `tuple`, and `enum`.
  - **Goal:** Understand type annotations and type inference for variables.
- **Day 4 (Nov 20):**
  - **Topic:** Type Inference and Type Annotations
  - **Task:** Practice type inference and explicitly annotate types in variables.
  - **Goal:** Understand how TypeScript detects types and how to explicitly set types for variables.
- **Day 5 (Nov 21):**
  - **Topic:** Variables (`let`, `const`, `var`)
  - **Task:** Learn how to declare variables using `let`, `const`, and `var` in TypeScript.
  - **Goal:** Practice declaring variables and understanding the differences between `let`, `const`, and `var`.

- **Day 6 (Nov 22):**
  - **Topic:** Interfaces
  - **Task:** Create simple interfaces for object types, arrays, and functions.
  - **Goal:** Define object structures with interfaces and practice typing arrays and functions.
- **Day 7 (Nov 23):**
  - **Topic:** Review and Practice
  - **Task:** Practice creating variables, defining types, and creating simple interfaces.
  - **Goal:** Reinforce your learning from the week through small exercises.

## *Week 2: TypeScript Basics (Nov 24 - Nov 30, 2024)*

- **Day 8 (Nov 24):**
  - **Topic:** Classes and Objects
  - **Task:** Learn how to create basic classes, define constructors, and add methods in TypeScript.
  - **Goal:** Understand object-oriented programming principles in TypeScript.
- **Day 9 (Nov 25):**
  - **Topic:** Methods in Classes
  - **Task:** Learn how to define methods inside a class and how to instantiate objects.
  - **Goal:** Understand how to use methods to manipulate data within class instances.
- **Day 10 (Nov 26):**
  - **Topic:** Constructor Functions and Constructor Types
  - **Task:** Understand how constructors work in TypeScript classes.
  - **Goal:** Learn to define and initialize class properties in constructors.
- **Day 11 (Nov 27):**
  - **Topic:** Function Types
  - **Task:** Learn how to type functions and define return types.
  - **Goal:** Understand how to define functions with specific input and output types.
- **Day 12 (Nov 28):**
  - **Topic:** Type Aliases

- **Task:** Learn how to define custom types with the `type` keyword in TypeScript.
- **Goal:** Practice creating custom types and using them in your code.
- **Day 13 (Nov 29):**
  - **Topic:** Review and Practice
  - **Task:** Build small examples using classes, methods, and function types to consolidate knowledge.
  - **Goal:** Strengthen understanding through hands-on coding.
- **Day 14 (Nov 30):**
  - **Task:** Final review of Week 2 content, prepare for project work.
  - **Goal:** Feel confident with the basics of TypeScript, including classes, methods, and function types.

### ***Week 3: Project 1 (Learning Phase) (Dec 1 - Dec 7, 2024)***

- **Day 15 (Dec 1):**
  - **Topic:** Set Up Project: User Management CRUD App
  - **Task:** Set up a basic project structure with folders for models, controllers, and routes.
  - **Goal:** Prepare the project structure for building the User Management CRUD app.
- **Day 16 (Dec 2):**
  - **Topic:** Create: Add User
  - **Task:** Implement a `createUser` function to add new users using TypeScript classes.
  - **Goal:** Learn how to add new user data in your app.
- **Day 17 (Dec 3):**
  - **Topic:** Read: View Users
  - **Task:** Implement a function to display all users using arrays and objects in TypeScript.
  - **Goal:** Display a list of users from an array, reinforcing the use of objects and arrays in TypeScript.
- **Day 18 (Dec 4):**
  - **Topic:** Update: Modify User Data
  - **Task:** Implement a function to update user details using TypeScript methods.
  - **Goal:** Learn how to modify existing user data in the list.

- **Day 19 (Dec 5):**
  - **Topic:** Delete: Remove User
  - **Task:** Implement a function to delete a user from the list.
  - **Goal:** Understand how to remove data from arrays in TypeScript.
- **Day 20 (Dec 6):**
  - **Topic:** CRUD Implementation and Testing
  - **Task:** Test the CRUD functionality (Create, Read, Update, Delete) of your app.
  - **Goal:** Ensure all CRUD operations work as expected.
- **Day 21 (Dec 7):**
  - **Topic:** Final Review and Refinement
  - **Task:** Refactor and improve the code. Ensure type safety, optimize code, and clean up any errors.
  - **Goal:** Finalize your User Management CRUD app with TypeScript.

#### ***Week 4: Midterm (Implementation Exam) (Dec 8 - Dec 10, 2024)***

- **Day 22 (Dec 8):**
  - **Task:** Midterm Project Implementation
  - **Goal:** Complete a similar CRUD project from scratch (like the User Management app) and ensure that you've applied **everything** you've learned so far.
  - **Evaluation:** Assess your ability to implement TypeScript features, such as classes, interfaces, types, and functions.
- **Day 23 (Dec 9):**
  - **Task:** Refine and Test the Midterm Project
  - **Goal:** Review and test the project thoroughly, checking for any bugs or issues.
- **Day 24 (Dec 10):**
  - **Task:** Midterm Review and Evaluation
  - **Goal:** Review the project, get feedback (if possible), and assess your mastery of TypeScript basics.

By the end of **Part 1**, you will have a **solid understanding** of TypeScript basics and a fully functioning **User Management CRUD application** that demonstrates the core concepts you've learned.

