TypeScript Day 1 – Complete Beginner Notes

1. What is TypeScript?

TypeScript is a programming language built on top of JavaScript. It adds static typing, which helps catch errors before running your code. You write TypeScript (*.ts* files), then compile them into JavaScript (*.js*) using the **tsc** compiler.

2. Why TypeScript?

- Helps prevent bugs early
- Makes code easier to understand
- Better autocompletion in editors
- Works in all JavaScript environments after compilation

3. Installing TypeScript

To install TypeScript globally:
npm install -g typescript
Check version: tsc -v

4. Running TypeScript

TypeScript cannot run directly. You must compile it: tsc file.ts This generates: file.js Then run it using Node: node file.js

5. Type Annotations

You can add a type to a variable using a colon:
<pre>
let name: string = "Ashim"; let age: number = 21; let isStudent: boolean = true;
</pre>

Supported basic types: string, number, boolean, any.

6. Functions in TypeScript

Functions can define the types of parameters and the return type.

6.1 Function Example: Square

Code:

```
function square(n: number):
number {     return n * n;
}
console.log(square(3));
```

Explanation:

- Parameter n must be a number.
• The function returns a number.
- square(3) outputs 9.

6.2 Function Example: describeUser

Code:

```
function describeUser(name: string, age: number,
isStudent: boolean): void {     console.log("Name:",
name);     console.log("Age:", age);
console.log("isStudent:", isStudent);
}
describeUser("ashim", 12, true);
```

Explanation:

- name → string
- age → number
- isStudent → boolean

- Return type is **void** (no return value).

6.3 Optional Parameters

Optional parameters allow calling a function with missing values.

Code:

```
function greet(name: string, message?: string): void {
    if (message) {
        console.log(`Hello ${name}, ${message}`);
    } else {
        console.log(`Hello ${name}`);
    }
}

greet("Ashim", "Good Morning!");
greet("Ashim");
```

Explanation:

- message?: string → message is optional
- If message exists, print it
- If not, print a simple greeting

7. Summary of What You Learned Today

✓ What TypeScript is
✓ How TS compiles to JS
✓ Variables with types
✓ Functions with parameters
✓ Return types
✓ Optional parameters
✓ Several working examples you coded yourself