

let's cover the different data types and variable declarations in TypeScript:

1. ****Primitive Data Types****:

TypeScript supports the following primitive data types:

- ``number``: Represents numeric values, including integers and floating-point numbers.
- ``string``: Represents textual data, enclosed in single (") or double (") quotes.
- ``boolean``: Represents a logical value, either ``true`` or ``false``.
- ``null``: Represents the absence of a value.
- ``undefined``: Represents a variable that has been declared but not assigned a value.
- ``symbol``: Represents a unique identifier, often used for object property keys.
- ``bigint``: Represents arbitrary precision integers.

2. ****Variable Declarations****:

TypeScript provides three ways to declare variables:

- ``let``: Declares a mutable variable scoped to the block in which it is defined.
- ``const``: Declares an immutable variable whose value cannot be changed once assigned. It's also block-scoped.
- ``var``: Declares a variable with function-scoped or globally-scoped access. However, it's best to avoid using ``var`` due to its lack of block scope and potential hoisting issues.

Example:

```
``typescript
let num: number = 10;
const message: string = "Hello, TypeScript!";
var flag: boolean = true;
``
```

3. ****Type Annotations****:

TypeScript allows you to specify the type of a variable explicitly using type annotations.

Example:

```
``typescript
let count: number = 5;
let name: string = "John";
let isActive: boolean = true;
``
```

4. ****Type Inference****:

TypeScript can automatically infer the type of a variable based on its initialization value if a type annotation is not provided.

Example:

```
``typescript
let age = 25; // TypeScript infers age as number
``
```

```
let city = "New York"; // TypeScript infers city as string
...
```

5. **Type Union**:

TypeScript allows variables to have multiple types using type union syntax.

Example:

```
``typescript
let result: string | number;
result = "Success"; // Valid
result = 100; // Also valid
...
```

6. **Any Type**:

TypeScript provides the `any` type, which disables type checking for a variable, allowing it to hold values of any type.

Example:

```
``typescript
let dynamic: any = "Hello";
dynamic = 10; // Valid
dynamic = true; // Also valid
...
```

7. **Arrays**:

TypeScript supports arrays with type annotations to specify the type of elements they contain.

Example:

```
``typescript
let numbers: number[] = [1, 2, 3, 4, 5];
let names: string[] = ["Alice", "Bob", "Charlie"];
...
```

8. **Tuples**:

Tuples allow you to express an array where the type of a fixed number of elements is known, but they don't need to be the same type.

Example:

```
``typescript
let tuple: [number, string] = [1, "hello"];
...
```

9. **Enums**:

Enums allow you to define a set of named constants, making it easier to work with a set of related values.

Example:

```
``typescript
enum Color {
  Red,
  Green,
  Blue
}
let color: Color = Color.Green;
``
```

These are some of the key data types and variable declarations in TypeScript, offering strong typing and flexibility for building robust applications.