

Class, Read Only Properties, Optional Properties, Static Properties and Methods in TypeScript

Class

- A class is a blueprint for creating objects with properties and methods.

Example:

```
class Person {  
    name: string;  
    constructor(name: string) {  
        this.name = name;  
    }  
    greet() {  
        console.log(`Hello, ${this.name}`);  
    }  
}  
  
const p1 = new Person("Pavan");  
p1.greet(); // Output: Hello, Pavan
```

Read-only Properties

- Read-only properties cannot be changed after initialization.
- Use the **readonly** keyword.
- Useful for constants or values that shouldn't be modified.

Example:

```
class Car {  
    readonly brand: string;  
    constructor(brand: string) {  
        this.brand = brand;  
    }  
}
```

```
const car = new Car("Toyota");
```

```
// car.brand = "Honda"; // ❌ Error: Cannot assign to 'brand' because it is a read-only property.
```

Optional Properties

- Optional properties are not required when creating an object.
- Defined using the ? symbol.
- Useful when a property is not always needed.

Example:

```
class Student {  
    name: string;  
    age?: number;  
  
    constructor(name: string, age?: number) {  
        this.name = name;  
        if (age) this.age = age;  
    }  
}
```

```
const s1 = new Student("Pavan");  
const s2 = new Student("Kiran", 22);
```

Static Properties and Methods

- Static members belong to the class, not the instances.
- Accessed using the class name, not through objects.
- Useful for utility methods or shared data.
- **Example:**

```
class MathUtils {  
    static PI = 3.14;  
    static square(num: number): number {  
        return num * num;  
    }  
}
```

```
}  
console.log(MathUtils.PI); // 3.14  
console.log(MathUtils.square(5)); // 25
```