























Template Literals

- The backtick `character denotes a template literal string,
- Within it, insert any valid JavaScript (or TypeScript) expression by wrapping it in \${}.
- alert(`Hello, \${name.toUpperCase().substr(2)}`);
- They can span multiple lines of source code:
- alert(`Hello,
- your name is
- \${name}
- `);

Default Parameters

- const multNums = (a: number, b: number = 10): number => a * b;
- alert(multNums(3));

Spread and Rest

- The spread operator, which is three periods together, allows an iterable item, things like arrays or strings, to be expanded in places where zero or more arguments (in the case of function calls) or elements (for array literals) are expected
 - const addNums = (a: number, b: number): number => a + b;
 - const nums: number[] = [5, 6];
 - alert(addNums(...nums));
- This is in contrast to
 - alert(addNums(nums[0], nums[1]));

Handling error with spread Operator

- Handling error on the ...nums spread
- Argument passed to addNums() that says "Expected 2 arguments, but got 0 or more".
 - const addNums = (a?: number, b?: number): number => a + b;
 - const nums: number[] = [5, 6];
 - alert(addNums(...nums));
- question marks after the arguments indicate optional arguments
- optional argumentsmust always come last

rest operator

- const addNums = (...a: number[]): number =>
- a.reduce((acc, val) => acc + val);
- const nums: number[] = [5, 6];
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- Any argument prefixed with the ... operator means that zero or more arguments can be in that place.
- Use reduce() method to add up all the numbers passed in.

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Destructuring

- TypeScript supports two forms of destructuring: object and array.
- const person = {
- firstName: "Billy", lastName: "Joel", age: 70
- };
- const firstName = person.firstName;
- const lastName = person.lastName;
- const age = person.age;
- With destructuring
- const { firstName, lastName, age } = person;

- Arrays can be destructured in the same way:
- const vals = ["Billy", "Joel", 70];
- const [firstName, lastName, age] = vals;
- alert(firstName);
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- To swap the value of two variables without using a third, here's an answer using array
- destructuring in TypeScript:
- let x = 1;
- let y = 2;
- [x, y] = [y, x];
- alert(x); // 2
- alert(y); // 1

```
class Person {
 // Properties
 private name: string;
 private age: number;
 // Constructor
 constructor(name: string, age: number) {
  this.name = name;
  this.age = age;
 // Methods
 sayHello() {
  console.log(`Hello, my name is ${this.name}`);
 birthday() {
  this.age++;
  console.log(`Happy birthday! Now I am ${this.age} years old.`);
```

Classes

 Properties: – class Planet { name: string; mass: number; – constructor(inName: string, inMass: number) { – this.name = inName; – this.mass = inMass;

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```
class Planet {
private name: string = "none";
protected mass: number;
constructor(inName: string, inMass: number) {
this.name = inName;
this.mass = inMass;
public printName() {
alert(this.name);
```

Inheritance

- class Jupiter extends Planet {
 private colorBands: boolean = true;
 constructor() {
 super("Jupiter", 1234);
 }
 let j: Jupiter = new Jupiter();
- let j: Jupiter = new Jupiter()
- j.printName();
- alert(j.name);// error from TypeScript saying that "Property 'name' is private and only accessible within class 'Planet'.
- Subclass constructor, must call the superclass's constructor via the super() reference.

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Override members in the parent class

- add protected mass: number = 5555;
- to the Jupiter class
- In the Planet class:

```
public calcSuperMass(): number {
return this.mass * 2;
}
public calcSuperMass(): string {
return "" + this.mass * 2;
}
```

 The compiler will complain that you have a duplicate function Even a different argument list isn't enough:

```
public calcSuperMass(): number {
return this.mass * 2;
}
public calcSuperMass(a: number): string {
return "" + this.mass * a;
}
```

 Achieve overloading by using optional parameters or default parameters

```
– public calcSuperMass(massMultiple?: number):
  number {
– if (massMultiple) {
return this.mass * massMultiple;
return this.mass * 2;
– // Or:
– public calcSuperMass(massMultiple: number = 2):
  number {
return this.mass * massMultiple;
```

use a union type

```
    public calcSuperMass(a: number | string):

  number {

    if (typeof a === "number") {

    return this.mass * a;

} else {

    return this.mass * parseInt(a);

• }
• }
```

 Achieve overloading by using optional parameters or default parameters

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– public calcSuperMass(massMultiple?: number):
  number {
– if (massMultiple) {
return this.mass * massMultiple;
- return this.mass * 2;
– // Or:
– public calcSuperMass(massMultiple: number = 2):
  number {
return this.mass * massMultiple;
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Even a different argument list isn't enough:

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public calcSuperMass(): number {
return this.mass * 2;
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return "" + this.mass * a;
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    public calcSuperMass(a: number | string):

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} else {

    return this.mass * parseInt(a);

• }
• }
```

Getters and Setters

```
class Planet {
private _name: string = "No name set";
get name() {
return 'This planet's name is '${this._name}'.';
set name(inName: string) {
if (inName === "Pluto") {
this._name = "Not a planet";
} else {
this._name = inName;
 let p: Planet = new Planet();
 alert(p.name); // 'No name set'.
 p.name = "Pluto";
 alert(p.name); // 'Not a planet' (sorry, little guy!)
 p.name = "Venus";
 alert(p.name); // 'Venus'
```

- make read-only properties by only supplying a getter.
- class Planet {
- readonly name: string = "No name set";
- }
- let p: Planet = new Planet();
- alert(p.name); // Okay
- p.name = "Neptune"; // Error





