Strings

Ref Javascript

Characters & length

A string is text inside quotes. With simple letters, each character has one position, its index ; the first index is 0. JavaScript counts UTF-16 code units: an emoji may take two positions.

```
const word = "Script";
console.log(word.length);      // 6
console.log(word[0]);          // S
console.log(word[2]);          // r
console.log(word.at(-1));      // t  (counts back from the end)
console.log(word[word.length - 1]);   // t
```

- The last index is `length - 1`. `word[6]` is `undefined`, not an error.
- Strings are immutable : `word[0] = "s"` cannot change the string and throws a TypeError in strict mode. Build a new string instead.

Join strings with `+`, which is called concatenation :

```
const first = "Ada";
const last = "Lovelace";
console.log(first + " " + last);   // Ada Lovelace
```

String methods

A method is a function that belongs to a value. Call it with a dot. A string method gives back a **new** value and leaves the original alone.

```
const city = "  Hong Kong ";
console.log(city.trim());                  // Hong Kong
console.log(city.trim().toUpperCase());    // HONG KONG
console.log(city.length);                  // 12  (the spaces are still
↪  there)
```

Method	Meaning	Example	Result
`.toUpperCase()` / `.toLowerCase()`	change case	`"Hi".toLowerCase()`	`"hi"`
`.trim()`	remove spaces at both ends	`" hi ".trim()`	`"hi"`
`.includes(t)`	does it contain `t`?	`"cat".includes("a")`	`true`
`.indexOf(t)`	first position of `t`, or `-1`	`"cat".indexOf("t")`	`2`
`.slice(a, b)`	characters from `a` up to (not including) `b`	`"Script".slice(0, 3)`	`"Scr"`
`.split(sep)`	break into an array	`"a,b,c".split(",")`	`["a","b","c"]`
`.replace(a, b)`	swap the first `a` for `b`	`"cat".replace("c", "b")`	`"bat"`

```
const email = "mei@school.org";
const at = email.indexOf("@");
console.log(email.slice(0, at));          // mei
console.log(email.slice(at + 1));         // school.org
console.log(email.split("@"));            // ["mei","school.org"]
```

Template literals

A template literal is a string written between backticks (on most keyboards, the key left of 1). Put any expression inside `${ }` and its value is placed into the text:

```
const name = "Mei";
const age = 17;
console.log(`${name} is ${age} years old.`);   // Mei is 17 years old.
console.log(`Next year: ${age + 1}`);          // Next year: 18
```

- Backticks can also hold several lines of text.
- This is easier to read than many `+` signs: compare `"Hi " + name + "!"` with `` `Hi ${name}!` ``.

```
const price = 4.5;
console.log(`Two cost $${(price * 2).toFixed(2)}`);   // Two cost $9.00
```

Common mistakes

- `${ }` only works inside backticks. In `"Hi ${name}"` the text is printed exactly as typed.
- Methods do not change the string: `city.trim()` on its own line does nothing. Store the result: `const clean = city.trim();`.
- `slice(a, b)` stops **before** `b`, just like the last index is `length - 1`.