Web Application Development for Industrial Engineers

การพัฒนาเวปแอปพลิเคชันสำหรับวิศวกรอุตสาหการ

What is a variable?

- A variable is a *container* for a value
- Things we can store.
  - Actual value: `1` / `"Text"` / `true`, …
  - `Reference` (pointer) to an object

Declaring a variable

```
let myName;
let myAge;
```

- All code instructions should end with a semi-colon.

Initializing a variable

```
let myName;
myName = 'Chris';
```

or just

```
let myName = 'Chris';
```

Note about `var`

```
var myName;
var myAge;
```

- Old way of delcaring variable
- Error prone
  - Hoisting
  - Allowing re-declarations
- *Not recommended*

Re-declaration

- (Use quokka)

```
let x = 5;
let x = 10;
console.log(x); \\SyntaxError: Identifier 'x' has already been declared
```

Updating a variable

```
let myName = 'Chris';
myName = 'Bob'; //Updating
```

Good variable naming

Good

```
age;
myAge;
init;
initialColor;
finalOutputValue;
audio1;
audio2;
```

Bad variable naming

```
1;
a;
_12;
myage;
MYAGE;
var Document;
skjfndskjfnbdskjfb;
thisisareallylongstupidvariablenameman;
```

Variable types

- Numbers
- Strings
- Booleans
- Arrays
- Objects

Numbers

```
let myAge = 17;
console.log(typeof myAge); //number
```

Number operations

- `+`, `-`, `*`, `/`
- Modulo `%`
- Exponent `**`

Operator precidence

```
const num1 = 10;
const num2 = 50;
num2 + num1 / 8 + 2; //Get 53.25
(num2 + num1) / (8 + 2); //Get 6
```

Increment and decrement operators

```
let a = 1;
a++;
console.log(a); // 2
++a;
console.log(a); // 3
a += 1;
console.log(a); // 4
```

Strings

- Strings are pieces of text.
- When you give a variable a string value, you need to wrap it in single or double quote marks.

```
let dolphinGoodbye = 'So long and thanks for all the fish';
typeof dolphinGoodbye; //string
```

Use quotes in string

```
const bigmouth = 'Using \' is okay.  Also is "...';
console.log(bigmouth);
// Using ' is okay.  Also is "...
```

Concatenating strings

- `+` operator

```
const str1 = 'Hello';
const str2 = 'World';
console.log(str1 + ' ' + str2 + ' !');
```

- Template literal

```
console.log(`${str1} ${str2} !`);
```

- https://codepen.io/nnnpooh/pen/QWqNwzo

String / Number transformation

- A problem with a number stored as a string type

```
let myNumber = '74';
myNumber += 3; // Get 743
```

- To fix this

```
Number(myNumber) + 3;
```

- https://codepen.io/nnnpooh/pen/OJxNPKB

Multiline strings

- Break characters `\n`

```
const output = 'I like the song.\nI gave it a score of 90%.';
console.log(output);

// I like the song.
// I gave it a score of 90%.
```

Multiline strings (cont)

- Template literals respect the line breaks in the source code.

```
const output = `I like the song.
I gave it a score of 90%.`;
console.log(output);

// I like the song.
// I gave it a score of 90%.
```

Strings as objects

- Most things are objects in JavaScript.

```
const string = 'This is my string';
```

- The variable becomes a `String` object instance.
  - Contains properties and methods.

String length

```
const browserType = 'mozilla';
browserType.length; // 7
```

Accessing string characters

```
browserType[0]; // "m"
browserType[browserType.length - 1]; // "a"
```

- Remember: computers count from 0, not 1!

Testing if a string contains a substring

```
browserType.includes('zilla'); // true
```

Extracting a substring from a string

```
browserType.slice(1, 4); // "ozi"
browserType.slice(2); // "zilla"
browserType.slice(0, -1); // "mozill
```

Changing case

```
const radData = 'My NaMe Is MuD';
console.log(radData.toLowerCase()); //my name is mud
console.log(radData.toUpperCase()); //MY NAME IS MUD
```

Updating parts of a string

```
const browserType = 'mozilla';
const updated = browserType.replace('moz', 'van');

console.log(updated); // "vanilla"
console.log(browserType); // "mozilla"
```

- Note that `replace()` doesn't change the string it was called on.

Booleans

- Booleans are `true` / `false` values.
- These are generally used to test a condition, after which code is run as appropriate.

```
let iAmAlive = true;
let test = 6 < 3;
typeof test; //boolean
```

Calculator App

- https://ie-software-dev.netlify.app/codes/t07_js/t01_calculator/