Grow with Google: Lesson 11

Data Types & Variables

1. Intro to Data Types

- Data and data types are the building locks of any programming language.
- They help us organize information and determine how our programs run.
- Primitive Data Types
  - Numbers
  - Strings
  - Booleans
  - Undefined
  - Null

2. Numbers

- Numbers include and positive or negative integer.
- The console can perform arithmetic.
- The console can compare numbers.

```
Operator and Meaning

<  Less than

>  Greater than

<= Less than or Equal to

>= Greater than or Equal to

== Equal to

!= Not Equal to
```

- Comparisons evaluate to true or false, a boolean value.

3. Comments

- `// Single line comment.`

```
/* A comment

that spans

multiple lines */
```

4. Quiz: First Expression (2-1)

5. Strings

- Udacity Style Guide
  - Single quotes are preferred over double quotes, especially when creating strings that include HTML, which uses double quotes.
  - The exception is JSON, which requires double quotes.

6. String Concatenation

- Concatenation combines two strings into one.

```
'hello' + 'world'
// returns helloworld
// spaces must be explicit
```

- Any characters within a string will be interpreted as such.

```
'hello + world 5*10'
// returns hello + world 5*10
// the integers here evaluate to strings
// therefore no arithmetic is performed
```

- Implicit type coercion is a feature in JavaScript that converts one data type into another.

```
'hello' + 5*10
// returns the string hello50
// arithmetic is performed
// upon concatenation the evaluated integer is converted into a string
```

7. Variables

- Variables allow us to store data for reuse later.
- Variables should be written in camelCase.
- Google Style Guide

8. Quiz: Converting Temperatures (2-2)

```
var celsius = 12;
var fahrenheit = celsius * 1.8 + 32;


console.log(fahrenheit); // 53.6
```

9. String Index

- Individual characters in a string each have a location or index.
    - Strings are an array of characters.
    - Arrays can be indexed.

```
'Asia'[0]; // A
var name = "Asia";
name[1]; // S
```

- Let n = the number of characters in a string.
    - Characters within a string are indexed starting from 0.
    - The first character is at position 0.
    - The last character is at position n-1
- The `charAt()` method is another way to index characters.

```
var quote = "I love you!";
console.log(quote[4]); // v
quote.charAt(4); // v
```

10. Escaping Strings

- Escaping a character interprets it literally, instead of as a signifier.

```
"She said, "Why don't you just drop dead?""
// Uncaught SyntaxError


"She said, \"Why don't you just drop dead?\""
// She said, "Why don't you just drop dead?"
```

- Quotes aren't the only special characters.

```
Code   Character
\\     \ (backslash)
\"     '' (double quote)
\'     ' (single quote)
\n     newline
\t     tab
```

- $\boxed{\texttt{\textbackslash n}}$ adds a line break to a string.
- $\boxed{\texttt{\textbackslash t}}$ inserts a tab.
- All special characters must be escaped.

```
'The file located at \"C:\\\\Desktop\\My Documents\\Roster\\names.txt\"
contains the names on the roster.'
// Returns "The file located at "C:\\Desktop\My Documents\Roster\names.txt"
contains the names on the roster."
```

11. Comparing Strings

- Case matters.
- Each character has a numerical value.
- These values essentially correspond with the character's locationin the ASCII table.

12. Quiz: Favorite Food (2-3)

- `console.log("Butter Pecan Ice Cream");`

13. Quiz: String Equality for All (2-4)

```
var answer = "ALL Strings are CrEaTeD equal" == "ALL Strings are CrEaTeD
equal";
console.log(answer); // True
```

14. Quiz: All Tied Up (2-5)

```
var joke = "Why couldn\'t the shoes go out and play? \nThey were all \"tied\"
up!"
console.log(joke);
// Why couldn't the shoes go out and play?
// They were all "tied" up!
```

15. Quiz: String Equality for All (2-4)

```
var haiku = "Blowing from the west \nFallen leaves gather \nIn the east."
console.log(haiku);
```

```
/* Blowing from the west
Fallen leaves gather
In the east. */
// Haiku by Yosa Buson
```

16. Booleans

- True
- False

17. Quiz: Facebook Post (2-7)

```
"Udacity" // String
"Meet Christian Plagemann, team lead for the new VR Developer Nanodegree
program at Udacity! Here he is introducing and describing our latest
offering." // String
"blog.udacity.com" // String
Whether something was liked or not. // Boolean
80 // Number
```

18. Null, Undefined, and NaN

- NaN: Not a Number
- Null: Has no value, or is empty. Set by the programmer.
- Undefined: No value assigned.

```
hello"/5 // NaN
var x = null; // x will return null.
var signedIn;
console.log(signedIn); // Console will print Undefined error.
```

19. Equality

- JavaScript is a *loosely typed language*.
  - Data types do not need to be specified.
  - Data types are converted automatically.
  - Triggered by the use of operators like `==` or `!=`.
  - Best practice is to use strict equality to avoid this behavior.

```
"3" > 1 // true, implicit type coercion

true >= 0 // true, implicit type coercion

1 !== false // true, strict equality

3 === 3 // true, strict equality
```

- *Strongly typed languages* result in errors if types do not match.

20. Quiz: Semicolons! (2-8)

- Semicolons can but should not be omitted.
- They add clarity to the code and tell the interpreter when statements end.
- Multiple lines of code can be written on the same line, but should not be.

```
var thingOne = "red";

var thingTwo = "blue";

console.log(thingOne + " " + thingTwo); // red blue
```

21. Quiz: What's my Name? (2-9)

```
var fullName = "Asia Hoe";
```

22. Quiz: Out to Dinner (2-10)

```
var bill = 10.25 + 3.99 + 7.15;

var tip = bill * 0.15;

var total = bill + tip;

console.log("$" + total.toFixed(2));
```

23. Quiz: Mad Libs (2-11)

```
var adjective1 = 'amazing';

var adjective2 = 'fun';

var adjective3 = 'entertaining';

console.log("The Intro to JavaScript course is " + adjective1 + ". James and

Julia are so " + adjective2 + ". I cannot wait to work through the rest of this

" + adjective3 + " content!")

/* The Intro to JavaScript course is amazing. James and Julia are so fun. I
```

```
cannot wait to work through the rest of this entertaining content! */
```

24. Quiz: One Awesome Message (2-12)

```javascript
var firstName = "Asia";
var interest = "drawing";
var hobby = "play games";
var awesomeMessage = "Hi, my name is " + firstName + ". I love " + interest +
". In my spare time, I like to " + hobby + ".";
console.log(awesomeMessage);
/* Hi, my name is Asia. I love drawing. In my spare time, I like to play games.
*/
```

25. Lesson 2 Summary

- Data Types
- Arithmetic