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INTRODUCTION TO JAVASCRIPT



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LECTURE: INTRODUCTION TO JAVASCRIPT

- DATA TYPES IN JAVASCRIPT
- VARIABLES IN JAVASCRIPT
- MAKE A SIMPLE PROGRAM, PRINTING A LINE OF TEXT
- USE JAVASCRIPT TO GENERATE ALERTS
- USE JAVASCRIPT TO TAKE INPUT FROM A WINDOW
- IF STATEMENTS



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WHAT IS JAVASCRIPT

- JavaScript adds interactivity to a website
- JavaScript makes your website come alive
- Not on the server like PHP or Ruby
- JavaScript is not Java
- JavaScript is a scripting language



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BASIC CODE

- **Embedded Script**

`<script>`

... JavaScript code goes here

`</script>`

- **External Script**

`<script src="my_script.js"></script>`



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SCRIPT PLACEMENT

- at the very end of the **body**



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SCRIPT TAG

```
<!DOCTYPE html>
```

```
<html>
```

```
<head>
```

```
<title>HTML script Tag Example</title>
```

```
</head>
```

```
<body>
```

```
<input type="button" onclick="Hello();" name="ok" value="OK" />
```

```
<script type="text/javascript">
```

```
function Hello(){
```

```
    alert("Hello, World");
```

```
}
```

```
</script>
```

```
</body>
```

```
</html>
```



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OPERATORS



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ASSIGNMENT OPERATORS

- = assignment
- X = 5
- X = "Happy"



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ARITHMETIC OPERATORS

- + add
- - subtract
- * multiply
- / division
- % Modulus



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SHORTHAND OPERATORS

- **x++** we add one $x = x + 1$, increment x by 1

- ++x vs x++
- ++x will add 1 immediately
- x++ will add one next time the variable is used

- **X--** is decrement

- **x += y** is shorthand for $x = x + y$

- **x -= y** is shorthand for $x = x - y$

- **x /= y** is shorthand for $x = x / y$

- **x *= y** is shorthand for $x = x * y$

- **x %= y** is shorthand for $x = x \% y$



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LOGICAL OPERATORS

- logical operators
- **&&** AND (x == 5 **&&** y == 10)
- **||** OR (x == 5 **||** x == 10)
- **!** NOT (!x)



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COMPARISON OPERATORS

- == equal
- === equal (based on type and is better to use in most cases)
 - 5 === 5 is true
 - 5 === "5" is not true
- != not equal
- !== not equal (based on type and is better to use in most cases)
 - 5 !== 5 is not true
 - 5 !== "5" true
- > greater than
- < less than
- >= greater than or equal to
- <= less than or equal to



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VARIABLES



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ASSIGNMENT OPERATORS

- = assignment
- X = 5
- X = "Happy"

```
let myNumber = 22
let myString = "Hello, World"
let myBoolean = true
```

VARIABLES

Let allows us to “let” a variable be a specific value. Let is what we use to “declare a variable” this means to create a variable for the first time. Also known as “Initialization”

let x

- When we don't give a value to a variable it is called “unassigned”. An unassigned variables will have a value called (undefined)

let x = 5

- let x = 5 is giving a value to x

x = 10;

- Without let, var or const this variable is accessible everywhere in a program and generally isn't recommended

var x = 5

- Var is a which is less commonly used, it is function scoped and global scoped. var can be redeclared which can cause issues.

const x = 5

- Const stands for constant and can't have its values be changed

JS is a *loosely typed* language which means we don't have to declare the specific type like integer, character or Boolean. It automatically assumes the type



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VARIABLE NAMES

- Good
 - camelCase
 - good_name
 - Bad
 - \$camelCase
 - 5camelCase
 - &camelCase
 - JavaScript is case sensitive, box is not the same as Box
- https://www.w3schools.com/js/js_conventions.asp



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VARIABLE

Make two variables subtract the first from the second. Alert the final value

Input = 20, 5

Output = 15



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VARIABLE

Make two variables add the first to the second.
Alert the final value

Input = 20, 5

Output = 25



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SEMICOLON



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SEMICOLON

At the end of a line of code, you will often see “;”
This is a semicolon. It is used to indicate you have ended a line of code and everything after is a new line.

```
let name1 = "William Blake";
```



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SEMICOLON

While not 100% necessary, it is a best practice to add the semicolons to you code and some formatters will add them for you. Prettier is one such extension.



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SEMICOLON

There are some lines we don't use them after like when there is a curly brace

```
for (let index = 0; index < array.length; index++) {  
  console.log(index);  
}
```



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TEXT-EDITOR



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WHAT IS YOUR TEXT EDITOR TRYING TO TELL YOU?

You may see a red underline; this is like spell check in things like Microsoft Word. This is more important than a spelling error because it means your program won't run

```
let x =  
let sum = 66
```




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WHAT IS YOUR TEXT EDITOR TRYING TO TELL YOU?

When you see the red underline, hover(place the cursor over top of the word) and it will give you suggestions on how to fix the error, though it might not always be the best suggestion.



```
let x =  
let sum = 66
```

```
let sum: number  
' ,' expected. ts(1005)  
View Problem (Alt+F8) No quick fixes available  
let sum = 66  
console.log()
```



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WHAT IS YOUR TEXT EDITOR TRYING TO TELL YOU?

This one is better

```
for (let i  
  consol  
let x = 55
```

'}' expected. ts(1005)
script.js(23, 43): The parser expected to find a '}' to match the '{' token here.
View Problem (Alt+F8) No quick fixes available



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INPUT/OUTPUT

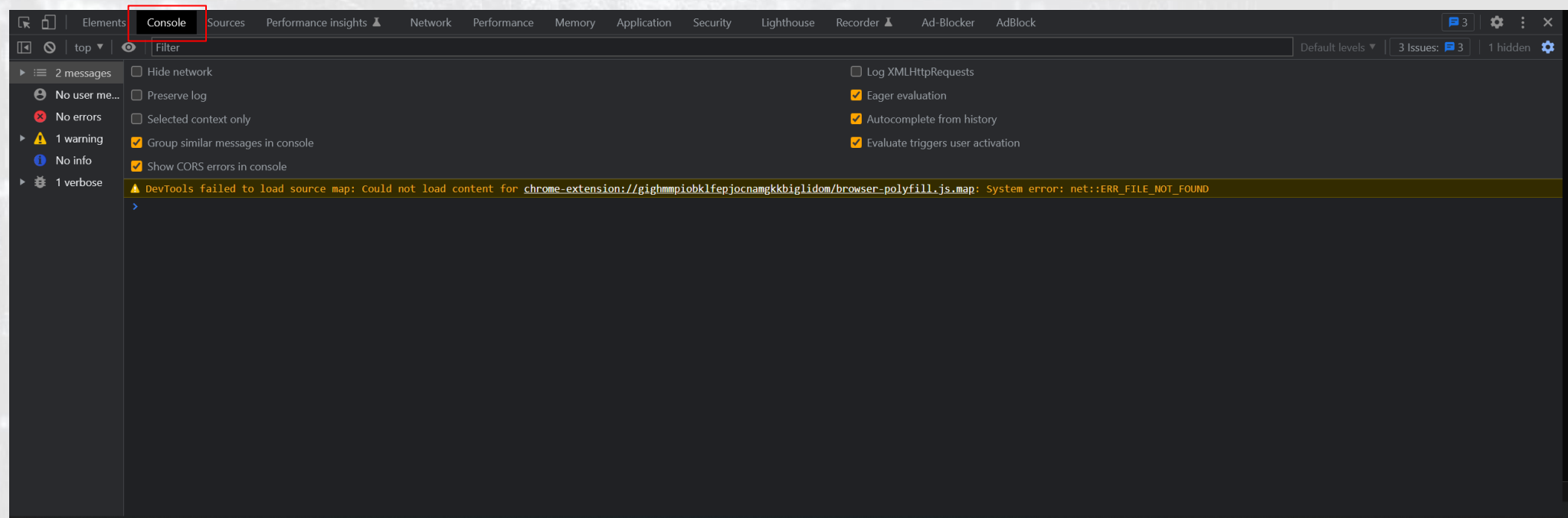
OUTPUT FUNCTIONS

- **alert()**
 - Displays to the user
- **window.alert()**
 - Same thing just alert() is shorthand
- **console.log()**
 - This is where programmers can output things like self created error messages.

OUTPUT FUNCTIONS

- `console.log()`

- To see the console open, google chrome>right click>select inspect>console



PROMPT INPUT

```
let age = prompt("How old are you?", "fillerDefault");  
console.log(age);  
console.log(typeof true)  
console.log(typeof false)
```

```
let age = +prompt("How old are you?","fillerDefault");
```

The + allows prompt to take in a number as a number,
without the + you will take in a number as a string



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I/O EXERCISE

1) Take two integer (whole number) values from a user (prompt) and add the numbers together.

Input = 11, 10

Output = 21

2) Check typeof true and false

3) Take in two strings into variables. One called hello, which takes in "Hello," one called world which takes in " world" and add them together.



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COMMENTS



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COMMENTS

// Comments are declared using two forward slashes or /**/

You can use short cuts (control + /) windows or (command + /) mac for //

(shift + alt + /) windows (shift + option + /) mac for /**/



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DATA TYPES



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DATA TYPE

Character

single

a, b, c

'a' 'b' 'c' '%' '7' '|'

string

cat (constant)

"cat"

Numbers

Integer

1,2,3

Real

2.75 != 27.5 != 275.0

Boolean

0, 1 || false, true



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JAVASCRIPT BASIC DATA TYPES

- Number
- String
- Boolean
- null
- undefined

JAVASCRIPT DATA TYPES

- JavaScript is a loosely typed language; this means we don't have to define the type we are using. This makes it easy for us when declaring variables but can cause issues when writing programs. This includes when we take in a value we may take in a "5" which is a character vs a 5 which is a number. TypeScript, Subset (Child of JavaScript) allows us to define types



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DATA TYPES

NUMBERS



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NUMBERS

- JavaScript has only one type of number and it can be written with both decimal and without decimals
- 123455654
- 32.5555



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NUMBERS

- This is a way to see the largest integer in JavaScript
- The size of these numbers are 64 bits

```
let x = Number.MAX_SAFE_INTEGER;  
let y = Number.MIN_SAFE_INTEGER;  
alert(x);  
alert(y);
```



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NUMBERS EXERCISE CONVERT...

- Convert the below to binary...

```
let x = Number.MAX_SAFE_INTEGER;  
let y = Number.MIN_SAFE_INTEGER;  
alert(x)  
alert(y);
```



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NUMBERS, CONVERT...

- Just kidding. You have suffered enough

```
let x = Number.MAX_SAFE_INTEGER;  
let y = Number.MIN_SAFE_INTEGER;  
alert(x)  
alert(y);
```



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DATA TYPES

STRINGS

STRINGS

- There are three different ways to create a string variable,

```
let name1 = "William Blake";  
let name2 = 'William Blake';  
let name3 = `William Blake`;
```

- The first is a double quotation, this is commonly used
- The second is a single quotation and it is less commonly used for strings but will often be used for individual characters.
- The third is called a back tick ``. This creates a template literal and is my preferred way to write strings in JavaScript.

STRINGS

```
let name1 = "William Blake";
```

- As mentioned before double quotes are commonly used to make strings. The limitation comes when we want to do 2 things.

1. Write a string that contains variables

```
let hello = "Hello"  
console.log(hello + ", World")
```

2. Add quotes into your string

```
let quote1 = "Earl Nightingale said, 'You become what you think about most of the time.'";  
let quote2 = 'Earl Nightingale said, "You become what you think about most of the time."';
```



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TEMPLATE LITERALS (TEMPLATE STRINGS)

- Template literals make the issues with “”s go away.

```
let Earl = `Earl Nightingale`;  
let quote3 = `${Earl} said, "You become what you think about most of the time."`;
```

STRINGS

- Each part of a string has an index number

myCode = C o d e

0 1 2 3

- myCode[3] != d
- it is e
- Variable.length is used to calculate the number of symbols in a string including spaces
- [] Is called a subscript operator (myCode address + (char size * 1))
- The subscript operator calculates the amount of bits between two data types stored in an array to find the address.

STRINGS EXERCISE 1

- 10 Make two variables. Make one contain the string “Hello”. make the other contain the string “world”. Alert, “Hello, world!”
- Input = “Hello”
- Input = “World”
- Output “Hello, World”

STRINGS EXERCISE 2

- Make two variables. Both will be a character. The first will be “1” the second will be “3” print out “13”
- Input = “1”
- Input = “3”
- Output = “13”

STRINGS EXERCISE 3

Make a prompt that takes a first name, last name, and age.

Get it to print in the console in one line.

Hello Maya Kali, you are 100 years old.



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STRINGS EXERCISE 4

- Using user inputs, make a Mad Lib that fills in the blanks:

Hi! Last week I went _____. My friend _____ and I had so much _____. There were _____ and _____. When we saw it we felt really _____. You should come next time!

STRINGS EXERCISE 5

- What is the value:
- Let bday = “Happy Birthday”
- `Console.log(bday[2])`



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DATA TYPES

BOOLEANS



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BOOLEANS

- By using a logical or Boolean operator you can compare both numbers, strings and Booleans
- Confirm functions ask users for yes or no statements

```
let ageConfirm = confirm("are above the age of 18?")
```



```
alert(`it is ${ageConfirm} that you are above the age of 18`)
```



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LOGICAL OPERATORS

- logical operators
- && AND (x == 5 && y == 10)
- || OR (x == 5 || x = 10)
- ! NOT (!x)



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COMPARISON OPERATORS

- == equal
- === equal (based on type and is better to use in most cases)
 - 5 === 5 is true
 - 5 === "5" is not true
- != not equal
- !== not equal (based on type and is better to use in most cases)
 - 5 !== 5 is not true
 - 5 !== "5" true
- > greater than
- < less than
- >= greater than or equal to
- <= less than or equal to



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LOGICAL OPERATOR

- 6 values that return false
 - false
 - 0
 - ""
 - null
 - undefined
 - NaN
 - NaN stands for Not at Number.



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LOGICAL OPERATOR

How will these be displayed in the console:

Exercise 1:

- *let* a = 5;
- *let* b = "r";
- `console.log(a === "5" && b === "r")`

```
let a = 5;
let b = "r"
let comparison = (a === "5" && b === "r");// this is putting a boolean into a variable with a
conditional statement
console.log(`the values of out comparison is ${comparison}`);// this is printing the variable into
the console with a boolean value
console.log(a === "5" && b === "r");// this is directly checking a boolean comparison in the console
```




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LOGICAL OPERATOR

Exercise 1 Answer:

```
let a = 5;
let b = "r"
let comparison = (a === "5" && b === "r");// this is putting a boolean into a variable with a
conditional statement
console.log(`the values of out comparison is ${comparison}`);// this is printing the variable into
the console with a boolean value
console.log(a === "5" && b === "r");// this is directly checking a boolean comparison in the console
```

LOGICAL OPERATOR

How will these be displayed in the console:

Exercise 2:

- *let* a = 5;
- *let* b = "r";
- `console.log(a !== "5" || b === "r")`



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LOGICAL OPERATOR

How will these be displayed in the console:

- Exercise 3
- *let* a = 5;
- *let* b = '6';
- `Console.log(!(a >= 5 || b === 6) || !(a === '5' && b === 6))`
- True



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DATA TYPES

DATA WITHOUT DEFINED DATA

UNDEFINED AND NULL

- `let x;`

- The above will print a value of undefined, generally it is wise to give a variable some sort of value, even if it is 0 or ""

- `x = null;`

- null means no value; this is different than undefined. Null can be given to a variable as a value and is an indication that the variable has an empty value. Null is different from undefined because null is a value just empty, undefined is something that has not been made into anything.
 - Think of a piece of clay you are going to make something with. A fresh piece of clay is undefined. A piece you will turn into a vase will have a value. A null value piece of clay will be like the end piece of the package that.



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DEBUGGING

WHAT IS A BUG?

The same person, Grace Hopper, who made the first compiler is attributed with coining the term “Debugging”. This was when she had found a moth in one of the computers in the 1940’s.

The term was commonly used 50 years prior to Grace by Thomas Edison in relation to technical errors in machines.



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TWO COMMON TYPES OF BUGS

1. Syntactical bugs
2. Logical bugs

SYNTACTICAL

- Syntactic bugs are caused by the programmer writing code in the wrong way. This often a small mistake like forgetting a semicolon, curly brace or misspelling something. Most text-editors have built in features to tell you when you made a mistake, but it might not always catch the mistake

LOGICAL BUGS?

- Logical bugs are generally harder to find. Logical bugs are based on errors in the logic. There are tools that allow us to find these bugs such as:
 1. Reading error messages
 2. Logging (in a console)
 3. The Debugger



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WHAT IS DEBUGGING?

- Debugging is a process we can use to go through our programs and find why it crashes, outputs wrong or doesn't do what we want.



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READING ERRORS

- Error messages are basically other programmers communicating with us that we have done incorrect. They may look like this:

```
Show output from: Build
1>----- Build started: Project: BuilderPatternRobot, Configuration: Debug|Win32 -----
1> BuilderPatternRobot.cpp
1>C:\Users\Mayas\source\repos\BuilderPatternRobot\BuilderPatternRobot\BuilderPatternRobot.cpp(13,1): error C2143: syntax error: missing ';' before '}'
===== Build: 0 succeeded, 1 failed, 0 up-to-date, 0 skipped =====
Build failed.
```

```
✖ ▶ Uncaught ReferenceError: random is not defined
   at script.js:11:35
```

Line 11

Character 35



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READING ERRORS

- Reading errors is one of the easiest ways to determine what is wrong with code.
- This feedback is invaluable and is often overlooked by beginners



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READING ERRORS

- What to do with an error you are unfamiliar with?
- Copy it and paste it into a search engine.
- Generally, stack overflow will pop up and someone will have found the answer



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LOGGING

- So, what if we have a bug with no error?? Now what??
- In some languages like JavaScript its common to use Logging. This allows us to see if our code is running where and how we want it to.
- The way you do this is throw a `console.log("What you are looking for")`, or `console.error("What you are looking for")` into the portion of the code you suspect is causing the issue

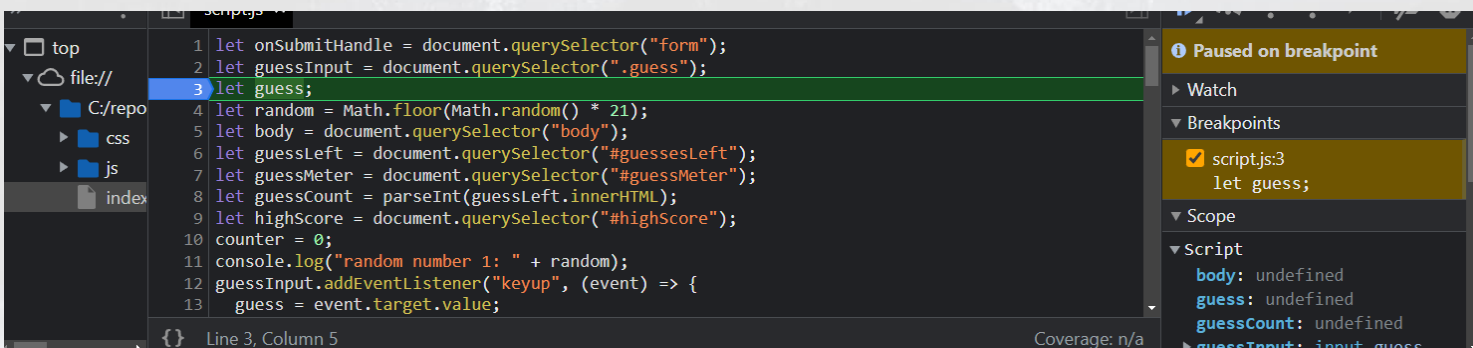


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THE DEBUGGER

- The debugger is one of my favorite tools.
- It slows the program down frame by frame so you can see what is happening





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THE DEBUGGER

- An analogy of debugging is Animation. When we slow down animation, we can see each frame like in this short film...
- https://www.youtube.com/watch?v=NLqiY7sJAho&ab_channel=PedroPaulino
- 4:02 – 4:41



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IF STATEMENTS



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IF STATEMENTS

If statements are used to direct the flow of our programs. They allow the computer to make decisions based on specific conditions.



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IF STATEMENT ANATOMY

```
if ( condition ){  
    ... code //  
}  
else if(condition){  
    ... code //  
}  
else{  
    ... code //  
}
```




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ELSE IF STATEMENT

```
if ( x === 1){  
    ... code  
} else if( x === 2){  
    ... another code  
} else{  
    ... another code  
}
```



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IF STATEMENTS COMPARISON



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COMPARISON OPERATORS

- == equal
- === equal (based on type and is better to use in most cases)
 - 5 === 5 is true
 - 5 === "5" is not true
- != not equal
- !== not equal (based on type and is better to use in most cases)
 - 5 !== 5 is not true
 - 5 !== "5" true
- > greater than
- < less than
- >= greater than or equal to
- <= less than or equal to



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IF STATEMENTS

COMPARISON OPERATORS

GREATER, LESS



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GREATER THAN, LESS THAN

```
if ( x > y ){  
    ... code  
}  
else if(x < y + 10){  
    ... code  
}  
else {  
    ...code  
}
```

```
if ( x >= y ){  
    ... code  
}  
else if(x <= y + 10){  
    ... code  
}  
else {  
    ...code  
}
```




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IF STATEMENTS

COMPARISON OPERATORS

EQUALITY



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EQUALITY

```
if ( x == y ){  
    ... code  
} else {  
    ... code  
}
```

Generally, don't use ==



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EQUALITY

```
if ( x === true ){  
    ... code  
} else {  
    ... another code  
}
```

Or:

```
if (x){  
}
```

Used mostly
with Booleans



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IF STATEMENTS

COMPARISON OPERATORS

INEQUALITY



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INEQUALITY

```
if ( 5 != '5'){  
    ... code  
} else {  
    ... another code  
}  
!x is the same as x != true
```

Or:
if (!x){
}
Used mostly
with Booleans



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INEQUALITY

```
if ( x != true ){  
    ... code  
} else {  
    ... code  
}
```

Generally, don't use **!=**



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IF STATEMENTS

COMPARISON

LOGICAL OPERATORS



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LOGICAL OPERATORS

- logical operators
- && AND ($x == 5 \ \&\& \ y == 10$)
- || OR ($x == 5 \ || \ x = 10$)
- ! NOT (!x)



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EXERCISE



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IF STATEMENT EXERCISE 1

Take a prompt and store it in a variable Beverage

- When it's coffee, then "I'll have coffee"
- When it's tea, then "I'll have tea"
- When it's Soda, then "I'll have soda"
- Otherwise, "I'll have water"



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IF STATEMENT EXERCISE 2

Take in one number, check if it is even or odd

Case 1) Input = 55

Output = odd

Case 2) input = 22

output = even



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IF STATEMENT EXERCISE 3

Determine if a number evenly divisible by 3 or evenly divisible by 5. When the number is evenly divisible by 3 print "fizz". When the number is evenly divisible by 5 print "buzz". When it is evenly divisible by both print "FizzBuzz". In all other circumstances print "No fizz No buzz"

Case1) Input = 25

output = Buzz

Case 2) Input = 30

output = FizzBuzz

Case 3) Input = 12

output = Fizz

Case 4) Input = 11

output = No fizz No buzz



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LOOPS

LOOPS

- The two most commonly used loops are
 - For loops
 - While loops
- For loops are counter based
- While loops are condition based
- There are variations of these two loops loops that have similar functionality, but are used in different situations



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OTHER LOOPS

- forEach
- forIn
- forOf
- do While



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LOOPS FOR LOOP



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LOOPS - FOR

- For loops are counter based loops that allow us to iterate a fixed number of times
- For loops have our variable initialization, conditions and counter built into the loop.



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LOOPS - FOR

```
for (let i = 0; i < 10; i ++){  
    console.log(i);  
}
```

```
Console.log("Hello")
```



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LOOPS – FOR BROKEN DOWN

```
for (let i = 0; i < 10; i ++){  
    console.log(i);  
}
```

let i = 0 // initialize variable as our counter

i < 10 // set condition

console.log(i) // code to be iterated over

i++ // increment counter



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LOOPS – FOR BROKEN DOWN

```
let i = 0
```

```
console.log(i) //prints out 0
```

```
i++
```

```
console.log(i) //prints out 1
```

```
i++
```

```
console.log(i) //prints out 2
```

```
i++
```

```
console.log(i) //prints out 3
```

```
i++
```

```
console.log(i) //prints out 4
```




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LOOPS FOR LOOP EXERCISES



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LOOPS - FOR

Exercise 1:

- Make a for loop that prints all the numbers from 1 – 100 in the console



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LOOPS - FOR

Exercise 2:

- Make a program that sums all the numbers from 1 – 100 in the console
- Input = 1
- Output = 5050



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LOOPS - FOR

Exercise 3 Homework:

- User inputs two numbers
- The program will print and sum all the even numbers between the user's input.
- Input = 1, 9
- Output = 2, 4, 6, 8
- "The sum of all the even numbers is 20"



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LOOPS

WHILE

LOOPS - WHILE

- While loops are a condition-based loop
- While loops can be turned into loop that count, but its best if we specifically use the while loop for conditions that have no defined ending
- Because while loops are based on a condition, they can run forever if the condition isn't met. This may crash whatever platform you are running (Unity will do this, web browsers generally have safety measures in place to prevent this.)



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LOOPS - WHILE

```
while(true){  
    console.log("Hello, world");  
}
```



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LOOPS - WHILE

This would be a for loop as a while loop

```
let i = 0;
```

```
while(i < 10){  
    console.log(i);
```

```
    i += 1
```

```
}
```



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LOOPS - WHILE

```
let health = 100;
```

```
while(health > 0){
```

```
    health -= damage();//this would be a function  
                        //that calculates damage
```

```
}
```

```
Print End Game
```

```
//based on the enemies  
//weapon being used
```




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LOOPS

WHILE LOOP

EXERCISES



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LOOPS - WHILE

Exercise 1

Write a program that finds the sum of all the numbers entered by a user (Look back to input/output). If a user enters 0 then the program stops, and “sum” is then displayed in the console.

Input = 1,2,5,6,0

Output = “The sum is 14”



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LOOPS - FOR

Exercise 2:

- Make a loop that finds the highest number from a set of user inputs
- Input = 1,5,6,8,9,55,10,9
- Output = 55

LOOPS - WHILE

Exercise 3

Make a program that calculates how many books you can buy. Take in Budget, and cost of each book (each book price will be different, and you will keep buying books till your budget is 0 or the last book you input is greater than your budget). Print, how many books can be purchased and the remaining budget.

1. Input = Case 1: Budget 85\$, cost of each book (25, 35, 15)
Output = "You can purchase 3 books and you have 10 dollars left over"
2. Input = Case 2: Budget 60\$, cost of each book (5, 15, 10, 20, 30)
Output = "You can purchase 4 books and you have 10\$ remaining"



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LOOPS

BREAK AND CONTINUE



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BREAK AND CONTINUE

Break – terminates the loop

Continue – terminate the iteration of the loop



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BREAK AND CONTINUE

```
let i;  
for (i = 0; i < 10; i += 1){  
    if(i===5){  
        break;  
    }  
    console.log(i);  
}
```



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BREAK AND CONTINUE

```
let i;
```

```
for (i = 0; i < 10; i += 1){
```

```
    if(i===5){
```

```
        continue;
```

```
    }
```

```
    console.log(i);
```

```
}
```



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BREAK AND CONTINUE IMAGES

```
26  for (let i = 0; i < 100; i++) {  
27      if (i === 5) {  
28          continue; // continue continues too the next iteration skipping everything  
                below it  
29      }  
30      if (i === 7) {  
31          break; // break ends our loop  
32      }  
33      console.log("this is i = " + i)  
34  }
```



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LOOPS

DO WHILE



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LOOPS – DO WHILE

Do while performs the action once before checking the condition

```
do{  
    console.log("Run once");  
} while(False)
```




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LOOPS – DO WHILE

```
44  
45     do {  
46         //will always run at least once  
47     } while (true);  
48
```



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LOOPS

NESTED LOOPS



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NESTED LOOPS

```
while (true) {  
  let x = +prompt("input a prime number", "18");  
  let prime = x !== 1 ? true : false;  
  alert(prime);  
  for (let i = 2; i < x; i++) {  
    if (x % i === 0) {  
      prime = false;  
      break;  
    }  
  }  
  alert(`It is ${prime} that your number is prime`);  
}
```



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LOOPS

MORE LOOPS IN JAVASCRIPT



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MORE LOOPS

- Not all languages have these extra loops but many have variations
- For in
- For of
- For each
- Feel free to research in your leisure time



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ARRAYS

ARRAYS

- An array is a collection of similar data elements stored at contiguous memory locations. It is the simplest data structure where each data element can be accessed directly by only using its index number.
- Arrays in JS are by default dynamic arrays, which means they can change their size

ARRAYS

let year = ['January', 'February', 'March', 'April',
'May', 'June', 'June', 'July', 'August', 'September',
'October', 'November', 'December']

This is an example of an array

ARRAYS

Arrays have an index and that starts counting at 0

0

1

2

- `let year = ["January", "February", "March", "April", "May", "June", "June", "July", "August", "September", "October", "November", "December"]`



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ARRAY LENGTH PROPERTY

```
console.log(year.length)
```




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ARRAY METHODS

`year.push("Smarch");`

allows us to add an element at the end of an array

`year.unshift("Smarch");`

allows us to add an element at the beginning of an array.

`Year.pop("Smarch");`

allows us to remove the last element of an array

`Year.shift();`

Allows us to remove the first element of an array

`Year.splice(index,count); Year.splice(2,1);`

This will remove a specific part of an array

ARRAY METHODS(CONTINUED)

```
year.indexOf("April");
```

Allows us to find the index of an element in an array.

```
year.slice(from, to ); year.slice(1, 4 );
```

We can copy a part of an array. This copies from the index number so once again if we say 1 we are copying the second item in the array. This also only selects < the index number. So we are not taking 4 we are only taking 1, 2, 3

```
year.slice(from);
```

This will copy from a specific index all the way to the end.

```
year.slice();
```

This has no parameter. This will copy the whole array.



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ARRAY ITERATION

```
let _nums = [1, 2, 3, 4];  
let _sum = _nums[0] + _nums[1] +  
_nums[2] + _nums[3];  
console.log(_sum)
```



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ITERATE ARRAY

For loops and arrays are best friends

```
let _Nums = [10, 8, 5.2, 12, -1];  
let _sum = 0;  
for (let index = 0; index < _Nums.length;  
    index++) {  
    _sum += _Nums[index];  
}  
console.log(_sum)
```




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ITERATE ARRAY

There is even a closer friend of an array in JS and that is a forEach loop

```
let names = ["Erica", "Steven", "Jen",  
"Pseudonym"]
```

```
names.forEach(function(element){  
    console.log(element)  
});
```




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ARRAY

Exercise 1:

Create an array of 100 random numbers, then calculate how many odd numbers, even numbers and zeros there are in the array



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Exercise 2:

Create an array that will find the minimum and maximum of an array. Your program will also print the index that the min and max are at.



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Exercise 3:

Create a program that has an array of names when the user enters a name, the program calculates how many times the name is repeated.

Ex. John is input

The out put will be:

Name John:2 times

If there is only one name you will have to output:

Name John: 1 time



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ARRAY

Exercise 4

Create a function that convert a sentence input by a user into camelCase

“To be or not to be” becomes **“toBeOrNotToBe”**

You will use these functions:

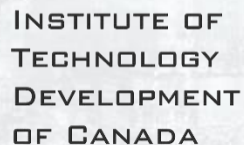
split()

substring(indexA, indexB)

.toUpperCase()

.toLowerCase()

.join()



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