THE INTRODUCTION TO

JAVASCRIPT PART 2

RECAP

- What is the purpose of JavaScript on the Web?
- What are the five primitive data types?
- What are Strings?
- What are Numbers?
- What are Booleans?
- What are Variables?
- What are Comments?

OUTLINE

- Operators
- Conditional Statements
- Loops
- Arrays
- Functions

OPERATORS

- Operators are the symbols between values that allow different operations like addition, subtraction, multiplication… etc.
- Common Operators:
  - Arithmetic Operators:
    - `+` The addition operator adds two numbers
      And concatenates strings together.

```
10 + 5; //outputs 15
"Hello" + " " + "World"; //outputs Hello World
```

OPERATORS

- Arithmetic Operators (continued)
  - `-` The subtraction operator subtracts one number from another.
  - `*` The multiplication operator multiplies two numbers.
    (Notice this is a * and not an x)
  - `/` The Division operator divides one number by another.
  - `%` The Modulus operator calculated the remainder of a quotient after division.

  - JavaScript expressions follow an order of operations.

  - Order of operations can controlled by the Grouping operator
    `()` The () operator groups other values and operations.
    Example:

```
(5 + 100) * 5;  // outputs 525
```

- Assignment operator
  `=` The = operator assigns values. Used in setting the values of variables.

- Comparison Operators

  == This is the equal to operator

  Example:

```
var myNumber = 10;


11 == myNumber; //outputs false
10 == myNumber; //outputs true
```

  != This is the not equal to operator

  Example:

```
12 != myNumber; //outputs true
```

  > This is the greater than operator

  Example:

```
100 > myNumber; //outputs true
```

- Comparison operators (continued)

  < This is the less than operator.

  Example:
```
100 < myNumber; //output false
```

  >= This is the greater than or equal to operator.

  Example:
```
120 >= myNumber; //outputs true
```

<= This is the less than or equal to operator.

Example:
```
10 <= myNumber; //outputs true
```

- Logical operators are used to determine the logic between variables or values.

`&&` This is the and operator

Example:

```
(mynumber < 100 && mynumber == 10); //outputs true
```

`||` This is the or operator

Example:

```
(mynumber >= 200 || mynumber > 5); //outputs true
```

`!` This is the not operator

Example:

```
!(10 == myNumber); //outputs false
!(13 < myNumber); //outputs true
```

JAVASCRIPT CONDITIONAL STATEMENTS

- Conditionals control behavior in JavaScript and determine weather or not a blocks or pieces of code can run.

  The most common type of conditional statement is the if statement, which only runs if the condition enclosed in parentheses () is truthy.

```
if(myNumber < 100) {
   console.log("myNumber is less than 100");
}
```

- else

  You can extend an if statement with an else statement, which adds another block to run when the if conditional doesn't pass.

```
if(myNumber < 100) {
  console.log("myNumber is less than 100");
} else {
  console.log("myNumber is greater than 100");
}
```

- else if

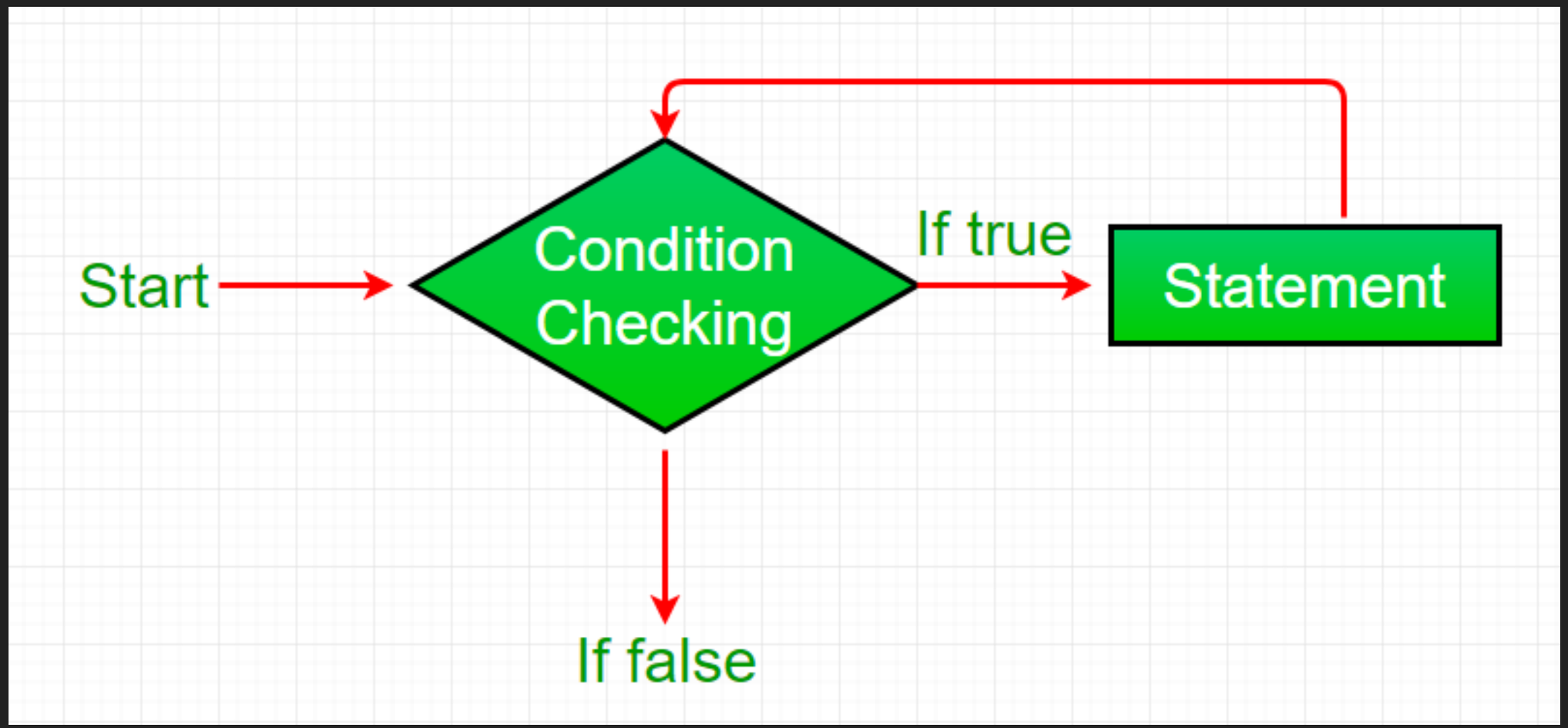
  You can also extend and if statement with an else if statement, which adds another conditional with its own block.

```
if(myNumber < 100) {
  console.log("myNumber is less than 100");
} else if(myNumber == 101) {
  console.log("myNumber is equal to 101");
} else {
  console.log("myNumber is equal to or greater than 101");
}
```

JAVASCRIPT LOOPS

- Looping is a feature in JavaScript and many other programming languages that facilitates the execution of instructions until the condition is true.

A Simple loop flowchart:



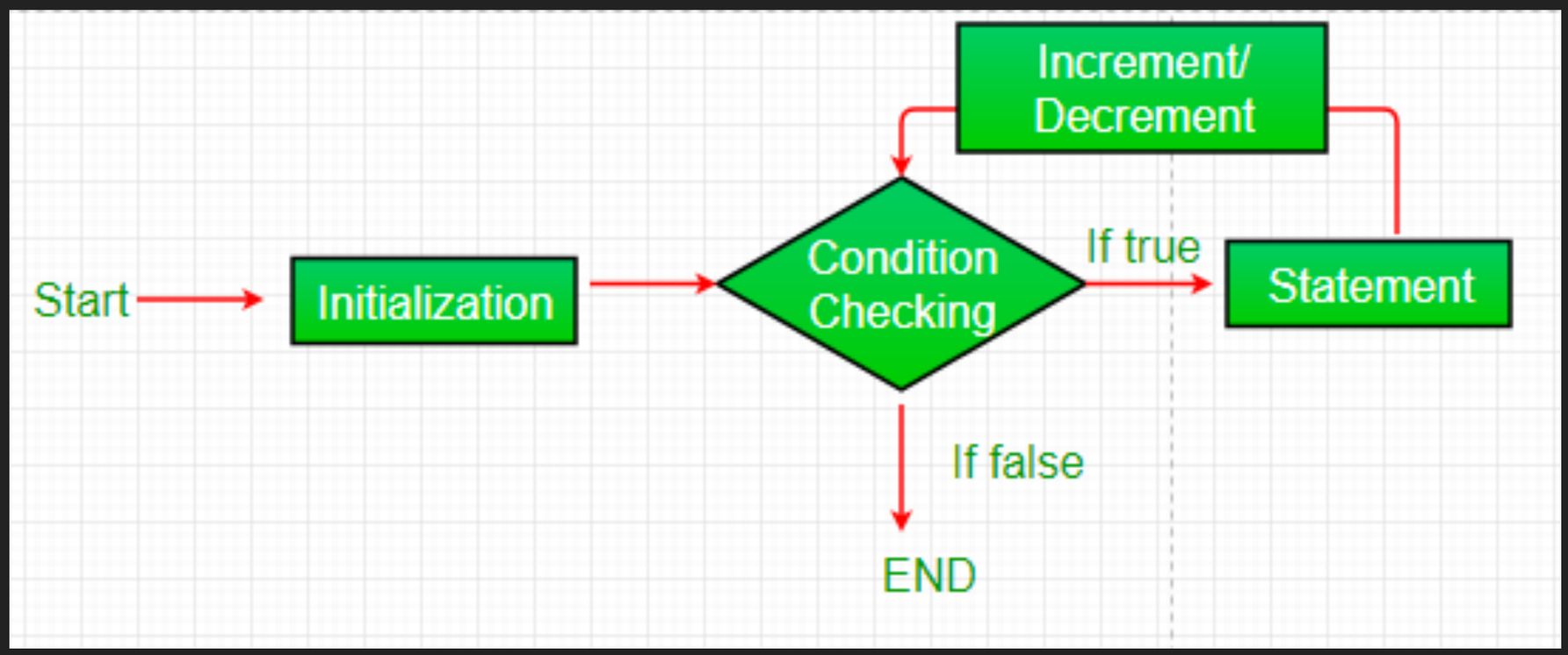
- while

  A while loop is a control flow statement that allows code to be executed repeatedly base on a give Boolean condition. The while loop can be thought of as a repeating if statement.

```
while(myNumber < 20) {
   console.log("I love puppies");
   myNumber = myNumber + 1;
}
```

- for

  A for loop provides a concise way of writing the loop structure. Unlike a while loop, a for statement consumes the initialization, condition, and increment/decrement in one line, providing a shorter, easy to debug structure of looping.



- for loop steps:
  - First you initialize the condition by making a variable to use. It marks the start of the loop. You can use a variable that is already declared or create one that will be local to the loop.
  - Second - you set a testing condition.
  - Third - if the testing condition is true, the statement in the loop body executes.
  - Fourth - the increment or decrement is used for updating the variable for the next iteration.
  - Fifth - when the condition becomes false, the loop ends marking the end of the cycle.

- An example of a for loop:

```
for (var i = 0; i < 200; i++) {
  console.log("i is equal to " + i );
}
```

- A common practice with for loops is to create a variable named i (which is shorthand for iterator) and to use the shorthand addition and subtraction operators.

```
i++; //is equal to the statement i = i + 1;
i--; //is equal to the statement i = i - 1;
```

- Arrays are container-like values that can hold other values. The values inside an array are called elements.
  - When creating an array the common practice is to create a variable and use the [] brackets to initialize the array. Example:

```
var namesArray = ["Mr. Fancy","Da Business","Bunkis"];
```

elements are separated by a comma

- Array elements don’t all have to have the same type of values. Elements can be any kind of JavaScript value, including an array.

```
var multiValueArr = ["String", [3,44,2],2000,false,{key:"value"}];
```

- To access an array element you’ll use the brackets with a specific element number inside.
  Example: `multiValueArr[2]; //output is 2000`
  Arrays elements begin at 0.

- To access the last element in an array we can use the .length property. But wait! The .length property starts counting at 1 not 0. So to access the last element in an array we subtract 1.
  Example:

```
multiValueArr[multiValueArr.length - 1]; //output is {key:"value"};
```

- We can also reassign elements by using bracket notation.
  Example: `multiValueArr[0] = "Captain Fancy";`

JAVASCRIPT FUNCTIONS

- Functions are blocks of code that can be named and reused.
  Example:

```
function sayHello(name) {
  return "Hello " + name + "!";
}
```

1. We use the function keyword to declare a function.
2. We set a name (sayHello) - make it declarative.
3. We set parameters that the function will accept.
4. We use the return keyword that exits the function and outputs the value.

JAVASCRIPT FUNCTIONS

- Using or invoking functions is accomplished by referencing its name followed by () parenthesis right after, and any parameters inside the ();

  Example:

```
sayHello("Captain Fancy"); //output Hello Captain Fancy!
```

TOOLS

- Mozilla Developer Network is the official Mozilla website for development documentation of web standards and Mozilla projects. A huge resource to look into specific JavaScript functionality https://developer.mozilla.org/en-US/
- https://repl.it is a tool that allows you to run simple programs written in multiple languages including JavaScript with a integrate console.
- https://stackoverflow.com/ - **Stack Overflow** is a question and answer site for professional and enthusiast programmers. If you have questions about a programming pattern, or problem - this site is an invaluable tool that professional software engineers use everyday.