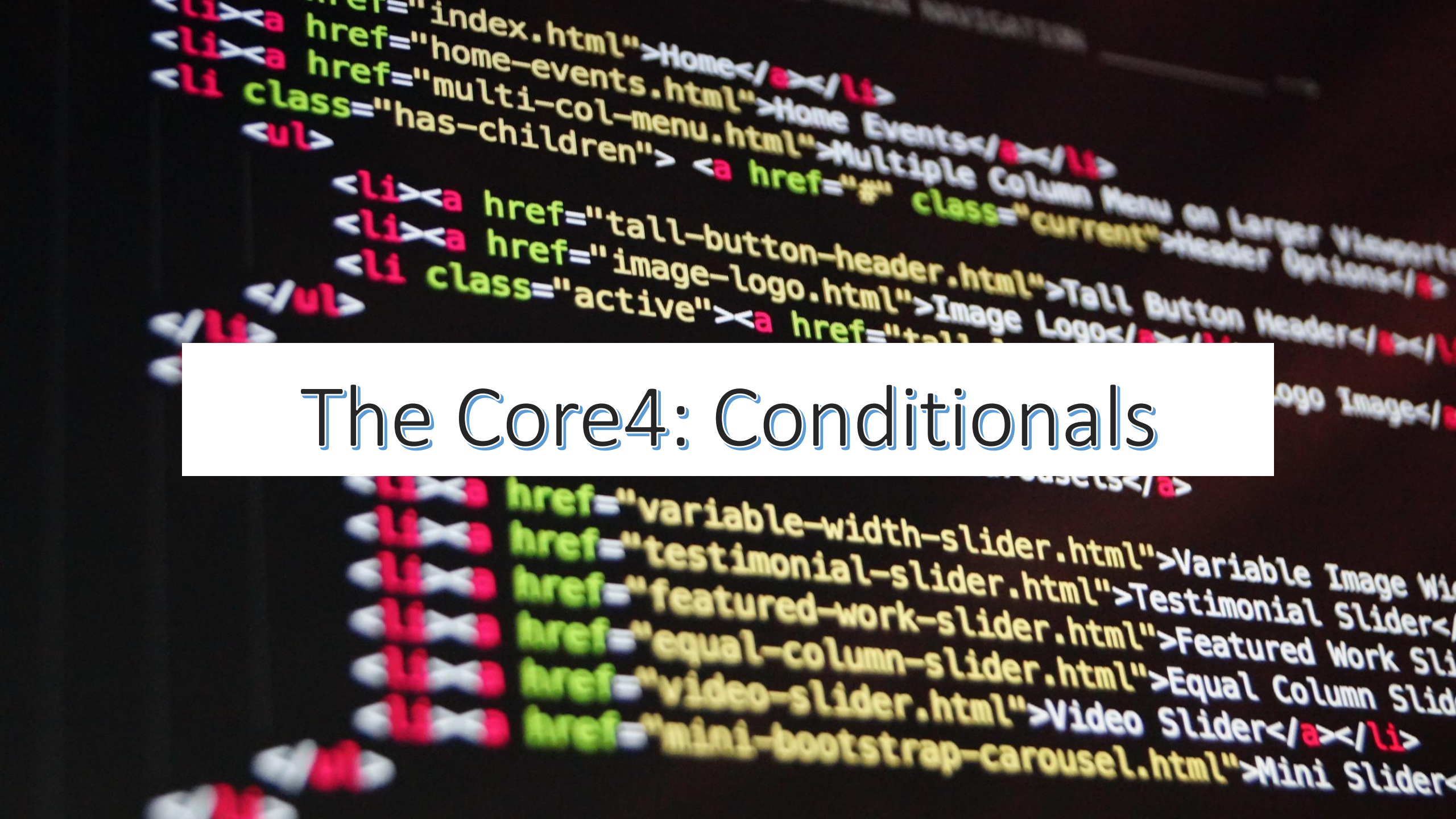


The Core4: Conditionals

Women's Spotlight: Mary Shaw

- Mary Shaw became the first woman to earn a Ph.D. in Computer Science from Carnegie Mellon University. Here's her story and accomplishments:

What are conditionals and why are they important?

In computer science, conditionals are statements that either evaluate to **true** or **false**. They tell a program to do a certain task depending on whether a statement is true or not.

Examples of conditionals in computer programming include:

- To allow a person access is true **only** with a correct password.
- Typing a letter on a document is false **unless** that letter is pressed.
- Allowing a person to start a game is true **only** by clicking a button.
- Can you come up with other computer examples you have come across?

Conditionals In Everyday Life

Let's practice conditionals more by using real-life examples:

- Example #1: **If** you eat healthy foods, **then** you will be healthy.
  - If the first statement is true, then the second one will be true as well.
- Example #2: **If** I run fast, **then** I will get tired more quickly. **Otherwise**, I won't be tired.
  - If the first statement is true, then the second will happen. If the first statement is **not** true, then an entirely different outcome happens.
- Come up with one more simple example for practice and share with the class.

Conditionals in Javascript: “If” Statement

- “If” statement – A conditional that gives the program a beginning statement to evaluate. An “if” statement can stand by itself or be stacked with other “if” conditional statements.

  - Example #1: If a string is equal to “Smith”, then print it.

  - Example #2: If a number is equal to 3, add 4.
    If a number is equal to 4, add 5.
    If a number is equal to 5, add 6.

Conditionals in Javascript: “Else” Statement

- “Else” statement – A conditional that means *“All other cases”.* This statement is sometimes used after an “if” statement or after an “else if” (which will be introduced soon) to take care of the rest of the cases not covered previously.

  - Example #1: If a string is equal to “Smith”, print “This string says Smith”.
    Else, print “This string is NOT Smith”

  - Example #2: If a number is less than 0, print “You cannot buy the candy bar.”
    Else, print “You have enough money to buy the candy!”

Conditionals in Javascript: “Else If” Statement

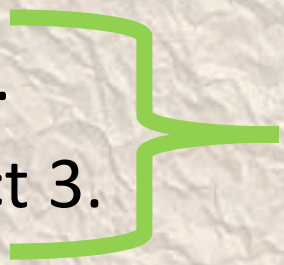
- “Else If” statement – A conditional that is often used to check a succession of “if” statements. It tells the computer “I’m the next conditional to try!” It comes after the first “if” and before the concluding “else” statement.

- Example: If: X is equal to 0, add 4.

  Else if: X is equal to 1, add 10.

  Else if: X is equal to 6, subtract 3.

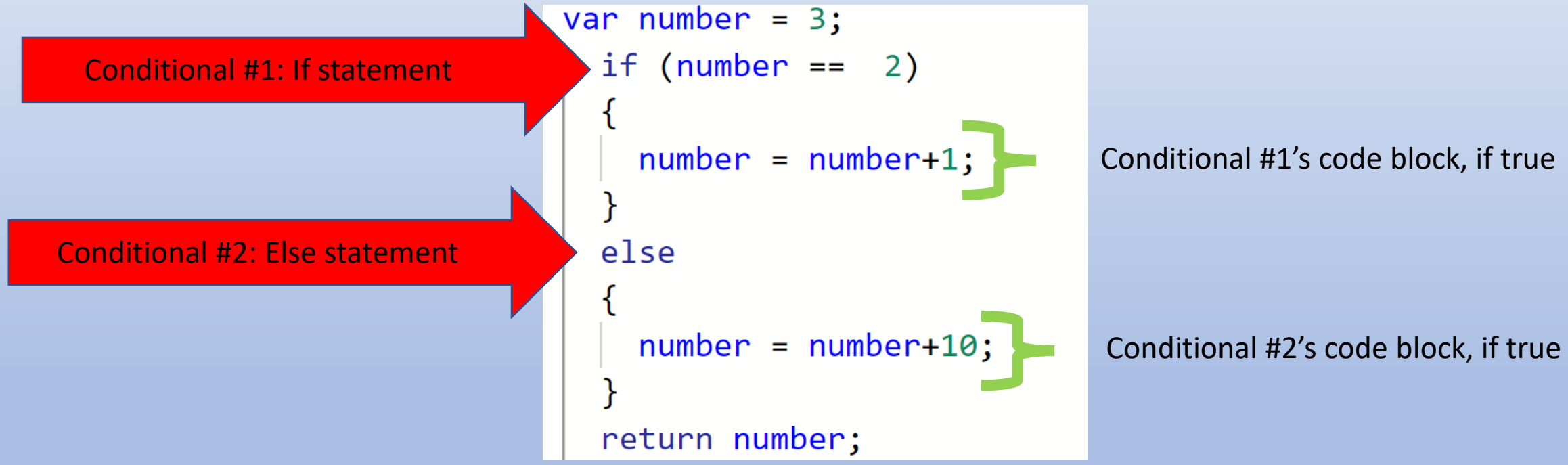
  Else add 20.



These two “Else if” statements basically act like “if” statements. The program simply runs them in the order written.

Conditionals in Code

- In Javascript, conditionals are written in a similar manner. Take a look at the following function and its conditionals. If the condition is met, the code inside the block runs. Otherwise, it gets ignored. **Note:** (==) means “equals”.



- Can anyone guess the value of the variable “number” after running the code?

Checking Multiple Comparison Statements

- You are not limited to checking ONE statement at a time. You can check if a name is “Jane” **OR** “Joe”. Or you can check if a number is less than 100 **AND** greater than 10.

- Examples of Usefulness:
  - Telling a user to make a password **between** 8 and 20 letters.
  - Telling a user “Good Morning” **between** the hours of 6 AM until 10 AM.
  - If, in a game, a player’s lives is greater than zero **or** the timer has not run out, keep the game running.

- Can you think of other uses?

Comparison Statements Chart

Comparison Symbol	English Translation	Explanation	Code Example
==	“Equal to”	Checks if a variable is equal to another	If (number == 3) console.log(number);
&&	“And”	Checks to see if a variable meets two conditions	If (number < 50 && number == 36) console.log(number);
||	“Or”	Checks to see if a variable meets at least one condition	If (number == 12 || number ==2) console.log(number);
!	“Not”	Checks to see if a variable meets its opposite condition	If (number != 7) console.log(number);
<	“Less Than”	Checks if a number is less than a required condition	If (number !=5 && number < 10) console.log(number);
>	“Greater Than”	Checks if a number is greater than a required condition	If (number !=5 || number > 40) console.log(number)

Conditionals in Code - Answer: 13

- Step 1: The variable “number” is set to the value three.
- Step 2: The conditional checks to see if the variable “number” is equal to two. Since number equals three and three does not equal two, it does not enter the conditional’s block to add one. It goes to the next conditional.
- Step 3: The next conditional says else, meaning “all other cases”. “number” fits in this category so ten is added.
- Step 4: “number” becomes thirteen.

```
var number = 3;
  if (number ==  2)
  {
    number = number+1;
  }
  else
  {
    number = number+10;
  }
  return number;
```

```
Native Browser JavaScript
13
=> undefined
```

Note: The conditionals had to be put in a function to display the answer.

Conditionals in Code: Exercise of the Day

- We are going to make a simple grade checker in Javascript using repl.it!
- Depending on the grade, you will check to see if a grade is an A grade, a B grade, a C grade, a D grade, or an F grade.
  - An A grade is between 90 **and** 100. If true, print “A grade” using console.log()
  - A B grade is between 80 **and** 89. If true, print “B grade” using console.log()
  - A C grade is between 70 **and** 79. If true, print “C grade” using console.log()
  - A D grade is between 60 **and** 69. If true, print “D grade” using console.log()
  - An F grade is between 0 **and** 59. If true, print “F grade” using console.log()
- **Remember:** To make multiple “if” statements run in order, the “else if” command is useful.
- **Note:** We will ONLY check numbers in-between end cases, not the end numbers, such as the number 90 or the number 100.

Use This Code to Get Started

main.js saved

```
1   function checkGrades(gradetobeChecked){
2     //Your code goes in here. The numbers you see
3     //passed in to this function at the bottom of
4     //the page will be used for testing.
5
6     //gradetobeChecked is the variable you
7     //will be testing to check the grade of.
8
9   }
10  checkGrades(93);
11  checkGrades(86);
12  checkGrades(77);
13  checkGrades(64);
14  checkGrades(45);
```

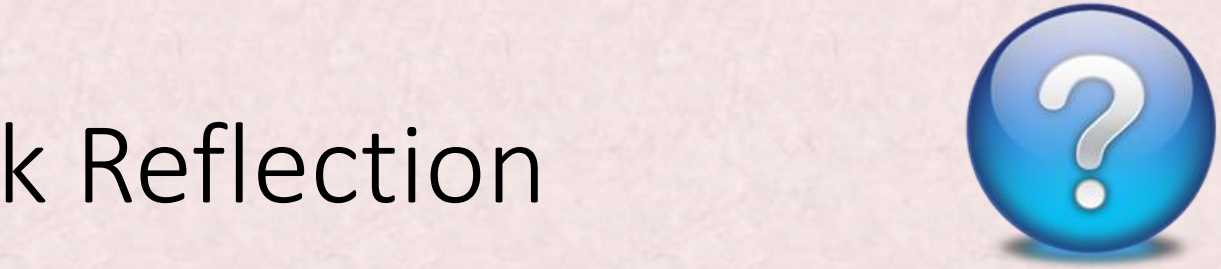
A Possible Solution:

main.js saved

```
1  function checkforGrades(gradetobeChecked) {
2    if (gradetobeChecked > 90 && gradetobeChecked < 100) {
3      console.log("A grade");
4    }
5    else if (gradetobeChecked > 80 && gradetobeChecked < 89)
     {
6      console.log("B grade");
7    }
8    else if (gradetobeChecked > 70 && gradetobeChecked < 79)
     {
9      console.log("C grade");
10   }
11   else if (gradetobeChecked > 60 && gradetobeChecked < 69)
     {
12     console.log("D grade");
13   }
14   else {
15     console.log("F grade");
16   }
17 }
18 checkforGrades(93);
19 checkforGrades(86);
20 checkforGrades(77);
21 checkforGrades(64);
22 checkforGrades(45);
```

```
Native Browser JavaScript
A grade
B grade
C grade
D grade
F grade
=> undefined
```

Quick Reflection



- Were there any coding problems that you ran into today? How did you solve them?
- What are some tips you can give your classmates when coding solutions?
- What is something you learned in this lesson that might be useful next time?


Have a Great week!