

Variables

Coding For Journalists

But first, let's talk webpages

Websites are made of three languages

Websites are made of three languages

- **HTML**

This is the content of the webpage.

Websites are made of three languages

- **HTML**

This is the content of the webpage.

- **CSS**

This is the design/appearance of the webpage.

Websites are made of three languages

- **HTML**

This is the content of the webpage.

- **CSS**

This is the design/appearance of the webpage.

- **JavaScript**

This is functionality of the webpage, what makes it interactive.

Two parts to a webpage

```
<!doctype html>
<html>
  <head>

  </head>
  <body>

  </body>
</html>
```

the <head>

Has all of the metadata for the webpage. It has the title, SEO keyword, CSS code, and anything else *about* the webpage.

the <body>

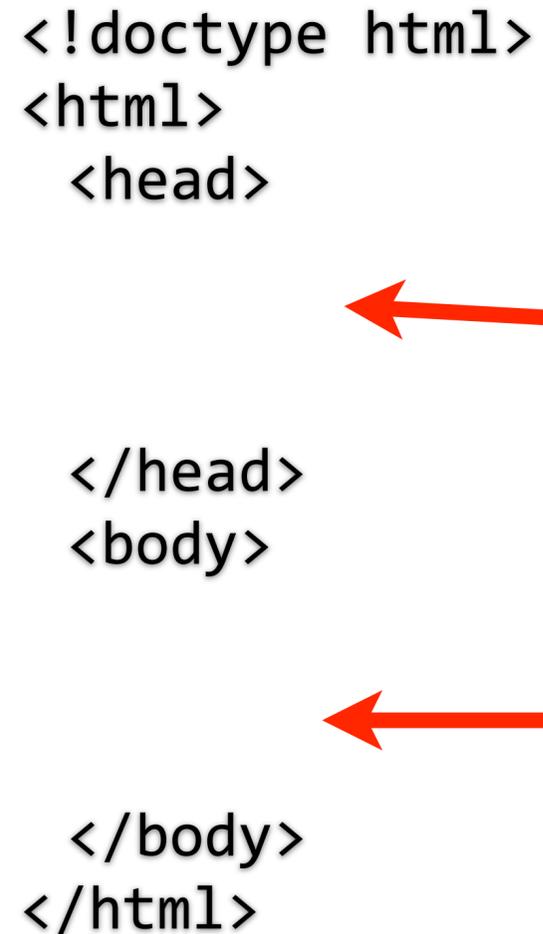
Has the actual webpage content people see when they visit this page.

We load JavaScript in the <body>

```
<!doctype html>
<html>
  <head>

  </head>
  <body>

  </body>
</html>
```

A diagram showing the structure of an HTML document. The code is enclosed in a box. Two red arrows point from explanatory text on the right to the <head> and <body> tags in the code. The first arrow points from the text 'the <head>' to the <head> tag. The second arrow points from the text 'the <body>' to the <body> tag.

the <head>

Loads before the webpage loads.
Use this for scripts that need to load instantly. It will slow the loading of the page if the script is large.

the <body>

Is the last thing to load, so it won't stall the web page loading.

Before we dive in



Jason Alvarez | [redacted] |
@0xBanana



I HATE PROGRAMMING
IT WORKS
I LOVE PROGRAMMING

What about Python?

- Python is a server-side language.
- In Journalism, we mostly use Python for conducting data analysis rather than creating apps.
- **JavaScript** — Make websites do things.
- **Python** — Conduct data analysis. Sometimes making apps/bots, machine learning, etc.

Variables

Assignment operator

$x = 7$

Assignment operator

$x = 7$



Assignment operator



$x = 7$

Assignment operator

`x = 7`

`x = 9`

Assignment operator

$x = 7$

$x = 9$

What is the value of x?

Assignment operator

$$x = 7$$

$$x = 9$$

What is the value of x?

Pop Quiz

$$x = 3438593487598$$

$$x = 2$$

What is the value of x ?

Pop Quiz

$$x = 3438593487598$$

$$x = 2$$

What is the value of x ?

Answer: 2

Pop Quiz

$$x = 234$$

$$x = 3$$

$$x = 4634$$

$$x = 1$$

What is the value of x?

Pop Quiz

$$x = 234$$

$$x = 3$$

$$x = 4634$$

$$x = 1$$

What is the value of x?

Answer: 1

Assigning a variable to another variable

$$y = 27$$

$$x = y$$

What is the value of x?

Assigning a variable to another variable

$$y = 27$$

$$x = y$$

What is the value of x?

Answer: 27

Assigning a variable to another variable

$$y = 3$$

$$x = 44$$

$$z = 22$$

$$k = 38953892$$

$$x = y$$

What is the value of x?

Assigning a variable to another variable

$$y = 3$$

$$x = 44$$

$$z = 22$$

$$k = 38953892$$

$$x = y$$

What is the value of x?

Answer: 27

Rules about variables

- The assignment operator (=) takes value from right side, and saves it into the left side.
- You can replace the value of variables.
- If a variable is assigned to another variable, it takes its value.

What the hell?

```
x = window.innerWidth
```

```
y = parseInt(321.5667)
```

```
window.location.href = url
```

REMEMBER

YOUR TRAINING

memegenerator.net

**MIND WHAT YOU HAVE
LEARNED**

**SAVE YOU IT
CAN**

Basic Arithmetic

$$x = 1 + 1$$

What is the value of x ?

Basic Arithmetic

$$x = 1 + 1$$

What is the value of x ?

Answer: 2

Basic Arithmetic

$$x = 45$$

$$y = 2$$

$$k = 3$$

$$x = y + k$$

What is the value of x ?

Basic Arithmetic

$$x = 45$$

$$y = 2$$

$$k = 3$$

$$x = y + k$$

What is the value of x ?

Answer: 5

Assigning a variable to itself!?

$$x = 10$$

$$x = x + 1$$

What is the value of x?

Assigning a variable to itself!?

$$x = 10$$

$$x = x + 1$$

What is the value of x?

Answer: 11

Assigning a variable to itself!?

$$x = 5$$

$$x = x + 5$$

What is the value of x?

Assigning a variable to itself!?

$$x = 5$$

$$x = x + 5$$

What is the value of x?

Answer: 10

Increment Operator

$$x = x + 1$$

is the same as

$$x += 1$$

Increment Operator

$$x = x + 1$$

is the same as

$$x += 1$$

Increment Operator

$$x = x + 1$$

is the same as

$$x += 1$$

Incrementing

$$x = 3$$

$$x += 3$$

What is the value of x?

Incrementing

$$x = 3$$

$$x += 3$$

What is the value of x?

Answer: 6

Decrement Operator

$$x = x - 1$$

is the same as

$$x -= 1$$

Decrement Operator

```
x = x - 1
```

is the same as

```
x -= 1
```

Decrement Operator

$$x = x - 1$$

is the same as

$$x -= 1$$

Incrementing

$$x = 3$$

$$x -= 3$$

What is the value of x?

Incrementing

$$x = 3$$

$$x -= 3$$

What is the value of x?

Answer: 0

Increase by 1

$$x = x + 1$$

is the same as

$x++$

Increase by 1

$$x = x + 1$$

is the same as

$$x++$$

Increase by 1

$$x = x + 1$$

is the same as

`x++`

Decrease by 1

$$x = x - 1$$

is the same as

$$x--$$

Decrease by 1

$$x = x - 1$$

is the same as

$$x--$$

Decrease by 1

$$x = x - 1$$

is the same as

$$x--$$

Enough Xs.

Don't use X for a variable name.

Choose descriptive words

- Variables must start with a letter*
- Only letters and numbers (ok, and an underscore).
- No spaces
- Variables are case sensitive, which means the variable **mytotal** is a different variable than **myTotal**.



Tweet



Tytanic
@woodsdt



Found out my wife is due in December and I'm already sweating about what to name this kid. I have a hard enough time deciding what to name my variables, how can I name a human??? Poor little i;

2:12 PM · 5/28/19 from [Virginia, USA](#) · [Twitter for iPhone](#)

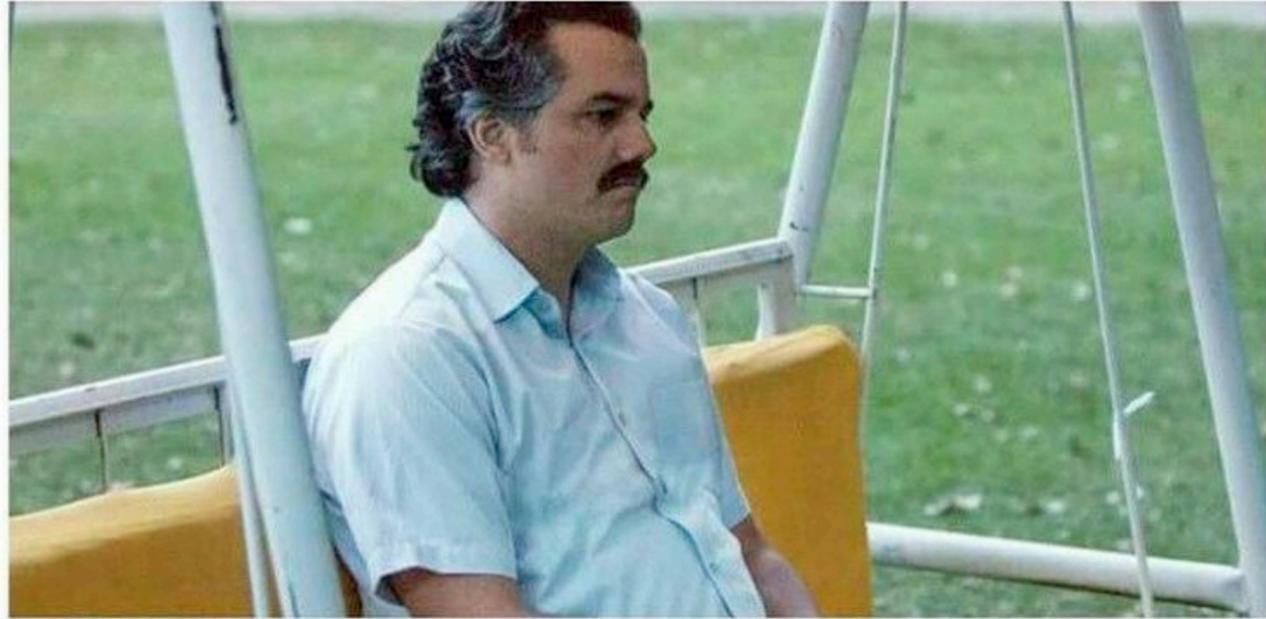


Actual
programming



Debating for
30 minutes on
how to name a
variable

When you try to choose
a meaningful variable name.





98

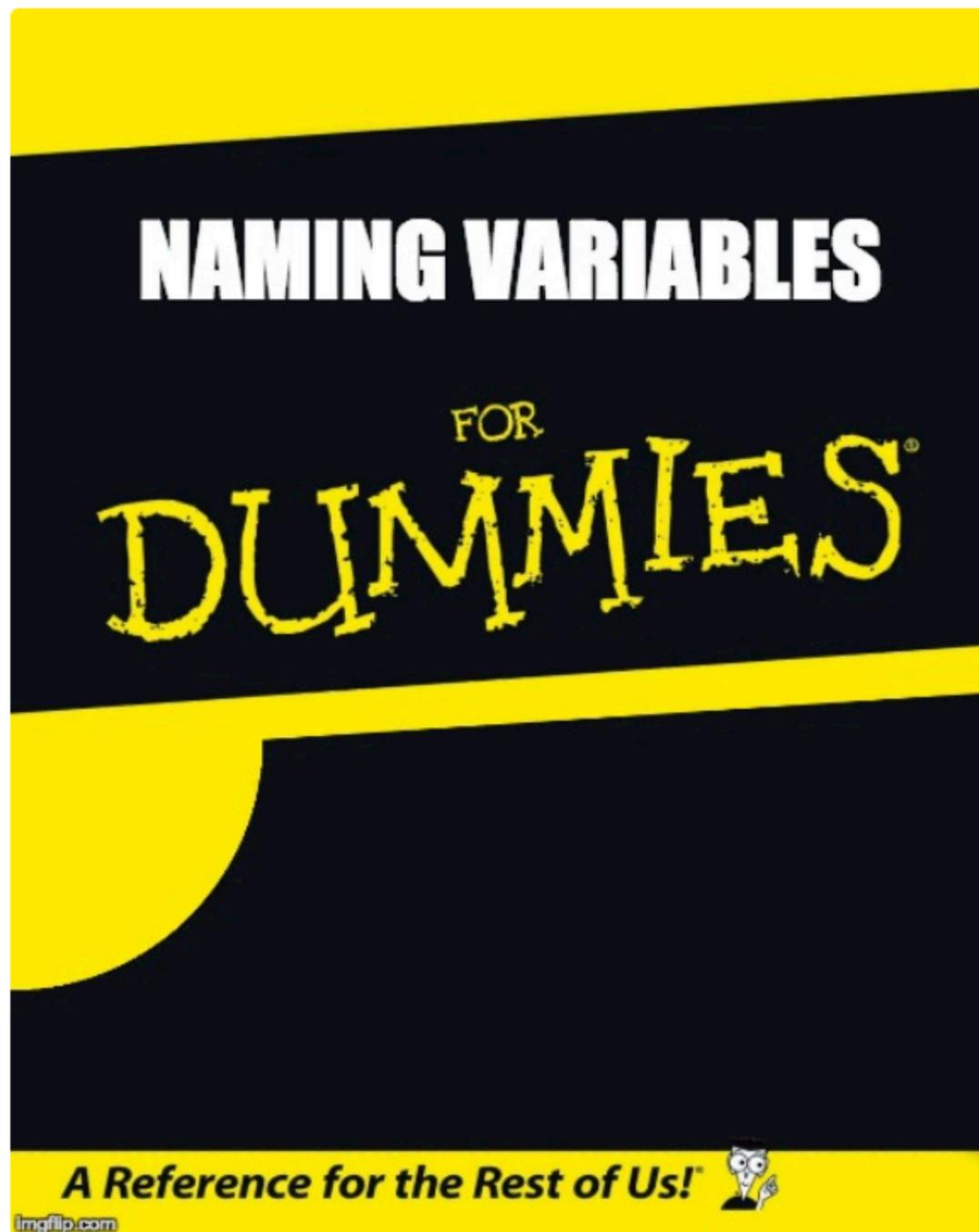


Sunsette

1987

3y

In all honesty, if there was a course on giving variables good, informative and not completely stupid names... I would take it.



Standard Practice

- Use camelCase. Which is when each word is capitalized.

thisLongVariableNameIsReadable

- Always start with lowercase letter. Uppercase has a special meaning to programmers.

myVariable

numberOfWords

picture01

Variable Names

numPhotos = 10

currentPhoto = 4

photosToEnd = numPhotos - currentPhoto

How many photos before they reach the end?

Variable Names

numPhotos = 10

currentPhoto = 4

photosToEnd = numPhotos - currentPhoto

How many photos before they reach the end?

Answer: 6

Variable Names

```
facebookLikes = 22  
facebookLikes += 1
```

How many Facebook likes now?

Variable Names

```
facebookLikes = 22  
facebookLikes += 1
```

How many Facebook likes now?

Answer: 23

Strings

Strings are text

```
firstName = "Jeremy"
```

Strings must be surrounded by quotes
or else the program will think you are
trying to assign another variable

```
firstName = Jeremy
```



The variable Jeremy?

Strings

```
trueQuote = "Cutting corners just makes more corners."
```

```
justOneLetter = "a"
```

```
justASpace = " "
```

Concatenate

```
name = "Jeremy" + "Rue"
```

When you add two numbers together, you get the sum of those numbers.

When you add two strings together, it "concatenates" or connects them.

Value of name:
JeremyRue

Concatenation

```
firstName = "J"  
middle    = "-"  
lastName  = "Rue"  
fullName  = firstName + middle + lastName
```

What is the value of fullName?

Concatenation

```
firstName = "J"  
middle    = "-"  
lastName  = "Rue"  
fullName  = firstName + middle + lastName
```

What is the value of fullName?

Answer: J-Rue

Adding strings and numbers?

```
name = "Apple" + 5
```

It depends on the programming language, but if you don't get an error, it will concatenate

```
Apple5
```

Adding Variables

```
firstNumber = 3
```

```
secondNumber = 3
```

```
result = firstNumber + secondNumber
```

What is the value of result?

Adding Variables

```
firstNumber = 3
```

```
secondNumber = 3
```

```
result = firstNumber + secondNumber
```

What is the value of result?

Answer: 6

Adding Variables

```
firstNumber = "3"
```

```
secondNumber = "3"
```

```
result = firstNumber + secondNumber
```

What is the value of result?

Adding Variables

```
firstNumber = "3"  
secondNumber = "3"  
result = firstNumber + secondNumber
```

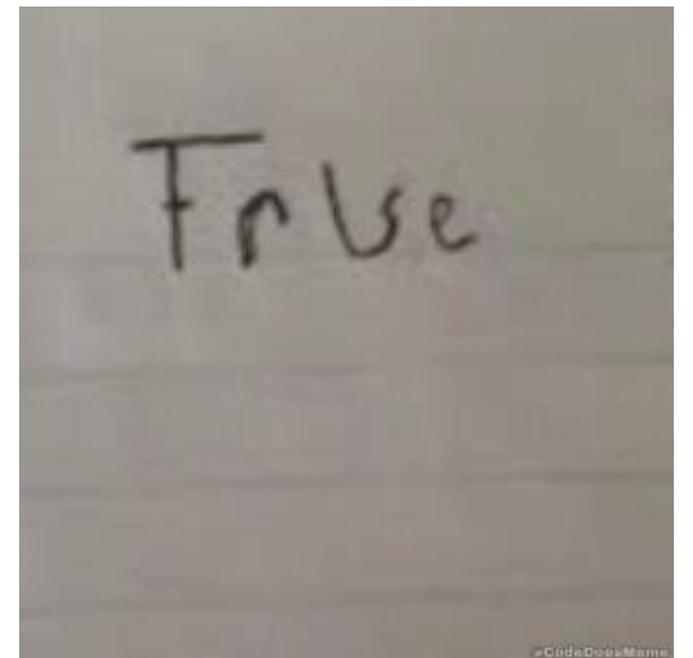
What is the value of result?

Answer string: 33

Data Types

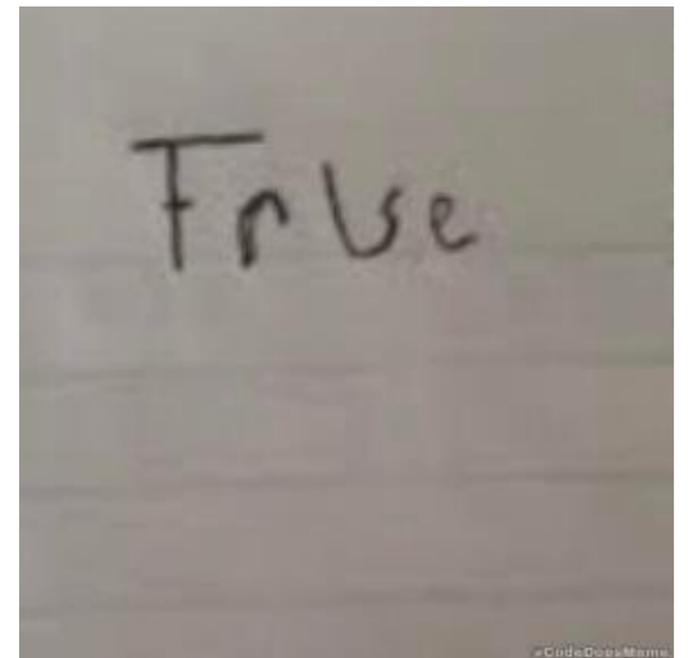
Every variable has a data type

```
numberVariable = 42
```



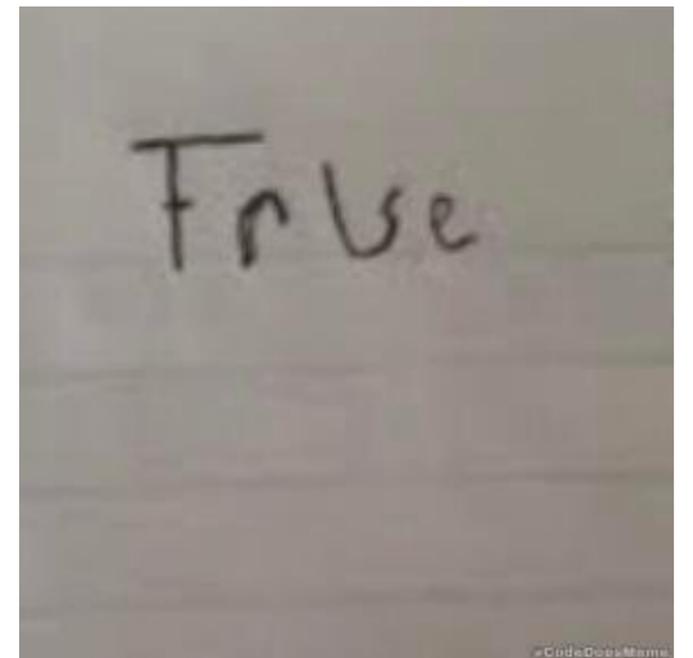
Every variable has a data type

```
numberVariable = 42  
stringVariable = "Hello World"
```



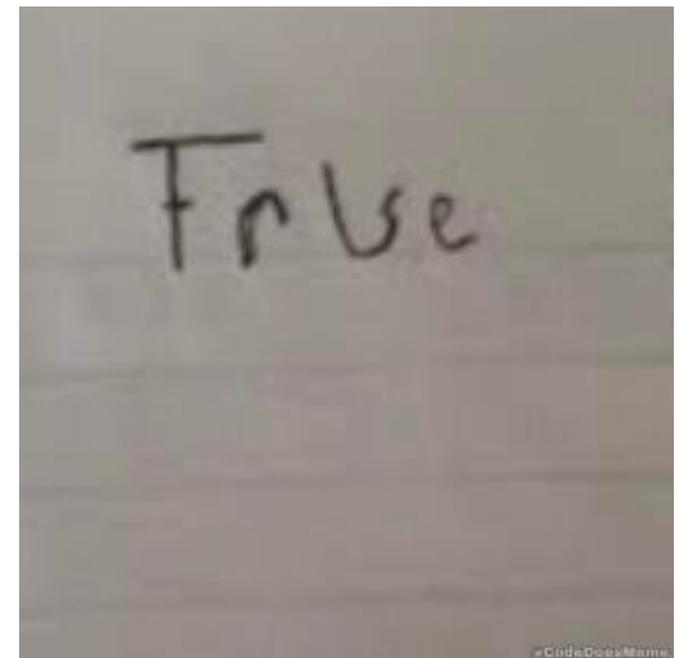
Every variable has a data type

```
numberVariable = 42  
stringVariable = "Hello World"  
booleanVariable = true
```



Every variable has a data type

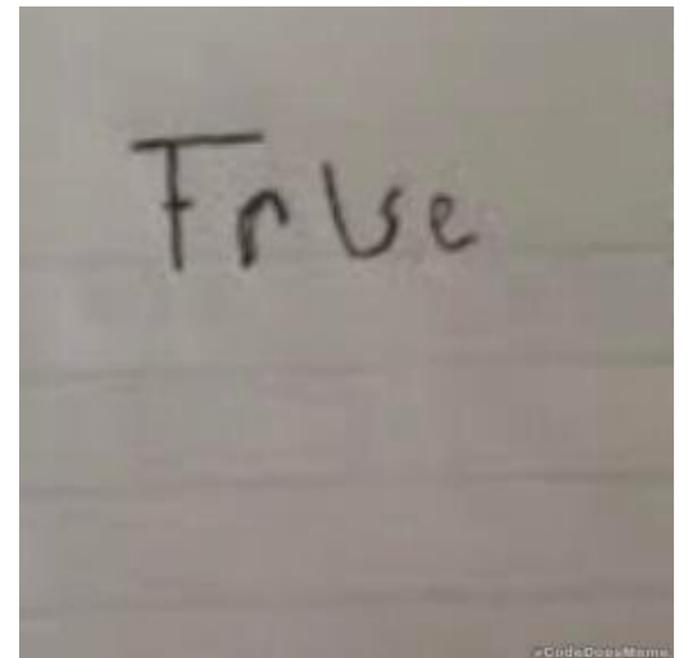
```
numberVariable = 42  
stringVariable = "Hello World"  
booleanVariable = true  
booleanVariable = false
```



Every variable has a data type

```
numberVariable = 42  
stringVariable = "Hello World"  
booleanVariable = true  
booleanVariable = false
```

Boolean variables have either a `true` or `false` value. The words "true" and "false" are recognized, and will not be interpreted as other variables. (In Python, `True` and `False` are capitalized)

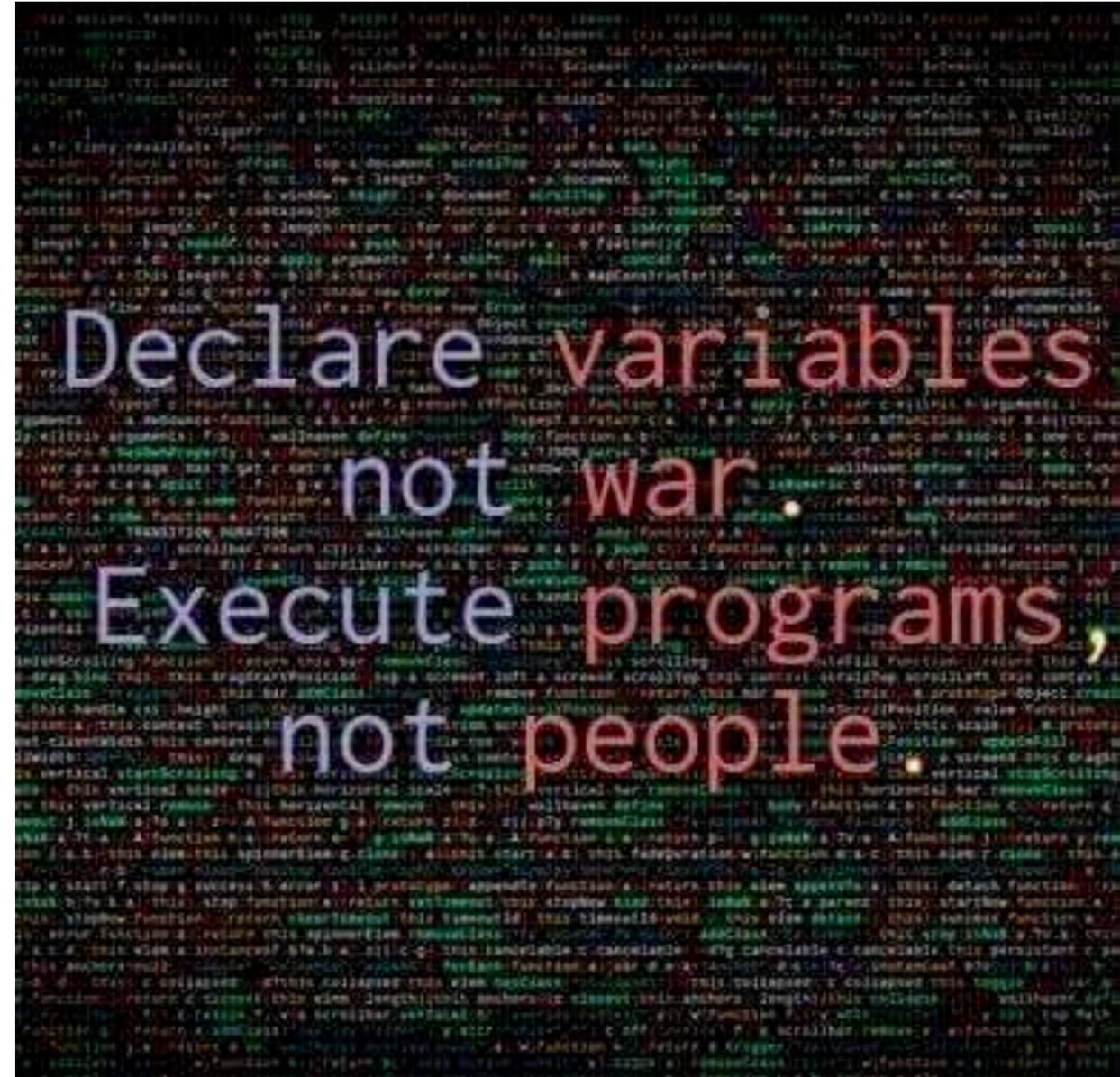


JavaScript specific syntax

```
var firstName = "Carlos";  
var lastName  = "Mann";  
var location  = "Oakland";  
location     = "Richmond";
```

The first time you create a variable in JavaScript, you must declare it using one of three keywords. After you declare a variable for the first time, you don't need to do it again.

In JavaScript, we close each line of code with a semicolon. (It's technically optional nowadays)



Declare variables
not war.
Execute programs,
not people.

Short Break

Arrays

Array

```
var myArray = ["john", "joe", "peter"];
```

An array is a method of storing multiple values into a single variable.

Array

```
["john", "joe", "peter"];
```

An array is a method of storing multiple values into a single variable.

Array

```
["john", "joe", "peter"];
```

Array

```
["john", "joe", "peter"];
```

..... square brackets

Array

Array

```
var myArray = ["john", 42, true];
```

These values can be any data type that can be in a typical variable.

Array

```
var myArray = ["john", 42, true];
```

These values can be any data type that can be in a typical variable.

Array

```
var myArray = ["john", 42, true];
```

These values can be any data type that can be in a typical variable.

Array

```
var myArray = ["john", 42, true];
```

These values can be any data type that can be in a typical variable.

Array

```
var arr = ["John", "Joe", "Jack", "Jim"];
```

Array

```
var arr = ["John", "Joe", "Jack", "Jim"];
```

Array

```
arr[0]  
var arr = ["John", "Joe", "Jack", "Jim"];
```

Array

```
arr[0]  
var arr = ["John", "Joe", "Jack", "Jim"];
```

Array

```
arr[0] arr[1]  
var arr = ["John", "Joe", "Jack", "Jim"];
```

Array

```
arr[0] arr[1]  
var arr = ["John", "Joe", "Jack", "Jim"];
```

Array

```
arr[0] arr[1] arr[2]  
var arr = ["John", "Joe", "Jack", "Jim"];
```

Array

```
arr[0] arr[1] arr[2]  
var arr = ["John", "Joe", "Jack", "Jim"];
```

Array

```
arr[0] arr[1] arr[2] arr[3]  
var arr = ["John", "Joe", "Jack", "Jim"];
```

Array Pop Quiz

```
var myArray = ["joe", "mary", "jane"];
```

What is the value of myArray[0]?

Array Pop Quiz

```
var myArray = ["joe", "mary", "jane"];
```

What is the value of `myArray[0]`?

joe

Array Pop Quiz

```
var myArray = [2, 4, 6, 8, 10];
```

```
var total = myArray[4] + myArray[2];
```

What is the value of **total**?

Array Pop Quiz

```
var myArray = [2, 4, 6, 8, 10];
```

```
var total = myArray[4] + myArray[2];
```

What is the value of **total**?

16

Array Pop Quiz

```
var arr = ["Joe", "Jane", " ", "Smith"];
```

```
var theName = arr[1] + arr[2] + arr[3];
```

What is the value of **theName**?

Array Pop Quiz

```
var arr = ["Joe", "Jane", " ", "Smith"];
```

```
var theName = arr[1] + arr[2] + arr[3];
```

What is the value of **theName**?

Jane Smith

Array Pop Quiz

```
var arr = [546, 5464, 43, 234, 546];
```

```
var total = arr[2 + 2];
```

What is the value of **total**?

Array Pop Quiz

```
var arr = [546, 5464, 43, 234, 546];
```

```
var total = arr[2 + 2];
```

What is the value of **total**?

546

Array Pop Quiz

```
var arr = [546, 5464, 43, 234, 546];
```

```
var i = 3;
```

```
var total = arr[i];
```

What is the value of `total`?

Array Pop Quiz

```
var arr = [546, 5464, 43, 234, 546];
```

```
var i = 3;
```

```
var total = arr[i];
```

What is the value of `total`?

234

Array Pop Quiz

```
var arr = [2, 4, 2, 6, 8, 0, 2, 7];
```

```
var i = 3;
```

```
var j = 0;
```

```
var total = arr[i] + arr[j] + arr[i+j];
```

What is the value of `total`?

Array Pop Quiz

```
var arr = [2, 4, 2, 6, 8, 0, 2, 7];
```

```
var i = 3;
```

```
var j = 0;
```

```
var total = arr[i] + arr[j] + arr[i+j];
```

What is the value of `total`?

Array Pop Quiz

```
var arr = [2, 4, 2, 6, 8, 0, 2, 7];
```

```
var i = 3;
```

```
var j = 0;
```

```
var total = arr[i] + arr[j] + arr[i+j];
```

What is the value of `total`?

Array Pop Quiz

```
var arr = [2, 4, 2, 6, 8, 0, 2, 7];
```

```
var i = 3;
```

```
var j = 0;
```

```
var total = arr[i] + arr[j] + arr[i+j];
```

What is the value of `total`?

Multi-Dimensional Arrays

An Array within an Array

```
var arr = [[1,2,3], [4,5,6], [7,8,9]];
```

An Array within an Array

```
var arr = [[1,2,3], [4,5,6], [7,8,9]];
```

```
arr[0]
```

An Array within an Array

```
var arr = [[1,2,3], [4,5,6], [7,8,9]];
```

```
arr[0][2]
```

An Array within an Array

```
var arr1 = [1, 2, 3];
```

```
var arr2 = [4, 5, 6];
```

```
var arr3 = [7, 8, 9];
```

```
var arr2d = [arr1, arr2, arr3];
```

```
arr2d[0][1]
```

An Array within an Array

```
var arr1 = [1, 2, 3];
```

```
var arr2 = [4, 5, 6];
```

```
var arr3 = [7, 8, 9];
```

```
var arr2d = [arr1, arr2, arr3];
```

```
arr2d[0][1]
```

An Array within an Array

```
var arr1 = [1, 2, 3];  
var arr2 = [4, 5, 6];  
var arr3 = [7, 8, 9];
```

```
var arr2d = [arr1, arr2, arr3];
```

What's the value of `arr2d[2][2]`?

An Array within an Array

```
var arr1 = [1, 2, 3];
```

```
var arr2 = [4, 5, 6];
```

```
var arr3 = [7, 8, 9];
```

```
var arr2d = [arr1, arr2, arr3];
```

What's the value of `arr2d[2][2]`?

An Array within an Array

```
var arr1 = [1, 2, 3];  
var arr2 = [4, 5, 6];  
var arr3 = [7, 8, 9];
```

```
var arr2d = [arr1, arr2, arr3];
```

What's the value of `arr2d[0][0]`?

An Array within an Array

```
var arr1 = [1, 2, 3];  
var arr2 = [4, 5, 6];  
var arr3 = [7, 8, 9];
```

```
var arr2d = [arr1, arr2, arr3];
```

What's the value of `arr2d[0][0]`?

An Array within an Array

```
var names = ["joe", "mary", "jane"];  
var ages  = [47, 85, 62];  
var loc   = ["Oakland", "Mission", "Richmond"];
```

```
var people = [names, ages, loc];
```

What's the value of `people[0][0]`?

An Array within an Array

```
var names = ["joe", "mary", "jane"];  
var ages  = [47, 85, 62];  
var loc   = ["Oakland", "Mission", "Richmond"];
```

```
var people = [names, ages, loc];
```

What's the value of `people[0][0]`?

joe