

CS-174A Discussion 1A, Week 1

@ Yunqi Guo

@ BOELTER 9436 / Friday / 10:00 am - 11:50 am

@ <https://github.com/luckiday/cs174a-1a-2020w> (<https://github.com/luckiday/cs174a-1a-2020w>)

Outline

- About this course
- JavaScript and WebGL Basics
- Assignment 1

CS-174A Introduction

About Me:

- Yunqi Guo, Ph.D student in Computer Science
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Grading Policies (100 pts)

	Points	Extra
Assignment 1		
Assignment 2	10	1
Assignment 3	10	2
Assignment 4	10	2
Team Project	30	5
Midterm Exam	15	
Final Exam	25	
Class Participation		1
Piazza Participation		2
Total	100	13

Purpose of CS174A Discussions

- Review the lectures

- Learn how to finish the assignments (35 pts)
- Discuss course project (35 pts)

JavaScript Basics

- JavaScript is a programming language that adds interactivity to your website!

```
In [4]: %%html
<p id="demo">JavaScript can change HTML content.</p>
<button type="button" onclick='document.getElementById("demo").innerHTML =
```

JavaScript can change HTML content.

Click Me!

JavaScript Basics

- Variable
- Function
- Class

Variable and Data types

JavaScript variables can hold many **data types**: numbers, strings, objects and more:

```
var length = 16; // Number
var lastName = "Johnson"; // String
var x = {firstName:"John", lastName:"Doe"}; // Object
```

```
In [5]: %%js
var num = 16; // Number
element.text("The number is " + num)
```

The number is 16

Objects

You define (and create) a JavaScript object with an object literal:

```
var person = {firstName:"John", lastName:"Doe", age:50, eyeColor:"blue"};
```

```
In [3]: %%js
var person = {firstName:"John", lastName:"Doe", age:50, eyeColor:"blue"};
element.text(person.firstName + "'s age is " + person["age"]);
// two ways for accessing the property of an object

var name = new String("John");
var name_2 = "John";
element.text(name === name_2);
```

false

Functions

A JavaScript function is a block of code designed to perform a particular task.

A JavaScript function is executed when "something" invokes it (calls it).

```
In [4]: %%js
function myFunction(p1, p2) {
  return p1 * p2;    // The function returns the product of p1 and p2
}

var a = 3;
var b = 4;
element.text("The product of a and b is " + myFunction(a,b))
```

The product of a and b is 12

Arrow Function

JavaScript arrow functions are roughly the equivalent of lambda functions in python or blocks in Ruby.

```
In [2]: %%js

const add = (a, b) => a + b;
element.text(add(1,2))
```

3

Object Methods

```
In [3]: %%js
var person = {
  firstName: "John",
  lastName : "Doe",
  id       : 5566,
  fullName : function() {
    return this.firstName + " " + this.lastName;
  }
};

element.text(person.fullName())
```

John Doe

Object Constructors

```
In [11]: %%js
function Person(first, last, age, eye) {
  this.firstName = first;
  this.lastName = last;
  this.age = age;
  this.eyeColor = eye;
}

var myFather = new Person("John", "Doe", 50, "blue");

element.text("My father is " + myFather.firstName + " " + myFather.lastName)
```

My father is John Doe.

JavaScript Classes

ES6, also known as ECMAScript2015, introduced classes.

A class is a type of function, but instead of using the keyword `function` to initiate it, we use the keyword `class`, and the properties is assigned inside a `constructor()` method.

Class Definition

Use the keyword `class` to create a class, and always add a `constructor` method.

The `constructor` method is called each time the class object is initialized.

```
class Car {
  constructor(brand) {
    this.carname = brand;
  }
}

mycar = new Car("Ford");
```

A Quick Way to Learn JS

- <https://www.w3schools.com/js/> (<https://www.w3schools.com/js/>).

WebGL Basics

WebGL (Web Graphics Library) is a JavaScript API for rendering interactive 3D and 2D graphics within any compatible web browser without the use of plug-ins. WebGL does so by introducing an API that closely conforms to OpenGL ES 2.0 that can be used in HTML5 `<canvas>` elements.

- [Demo 0: Clearing with colors \(demo_0/demo.html\)](#). How to clear the rendering context with a solid color.
- [Demo 1: Simple color animation \(demo_1/index.html\)](#). A very basic color animation.

... and some other projects

- [WebGL Wather](http://madebyevan.com/webgl-water/) (<http://madebyevan.com/webgl-water/>).
- [Make me pulse wish 2017](http://2017.makemepulse.com) (<http://2017.makemepulse.com>)

Assignment 1: Environment Setup and Creating a Simple Rectangle

- [Demo](https://classroom.github.com/classrooms/55804222-intro-graphics-master-f19-classroom-1) (<https://classroom.github.com/classrooms/55804222-intro-graphics-master-f19-classroom-1>).