

Hello, World!

An introduction to programming

By the end of this course, you will be able to:

- Think like a programmer
- Understand fundamental concepts every programmer should know
- Write simple programs in code
- Know where to go to continue learning

launch_code



SUMMER OF CODE

EXPLORE A NEW PATH THIS SUMMER

launchcode.org/summerofcode

- “The new form of literacy is coding”
- Marc Goodman, Cybersecurity Expert

What is Computer Science?

- Mathematics
- Logic
- Engineering
- Philosophy

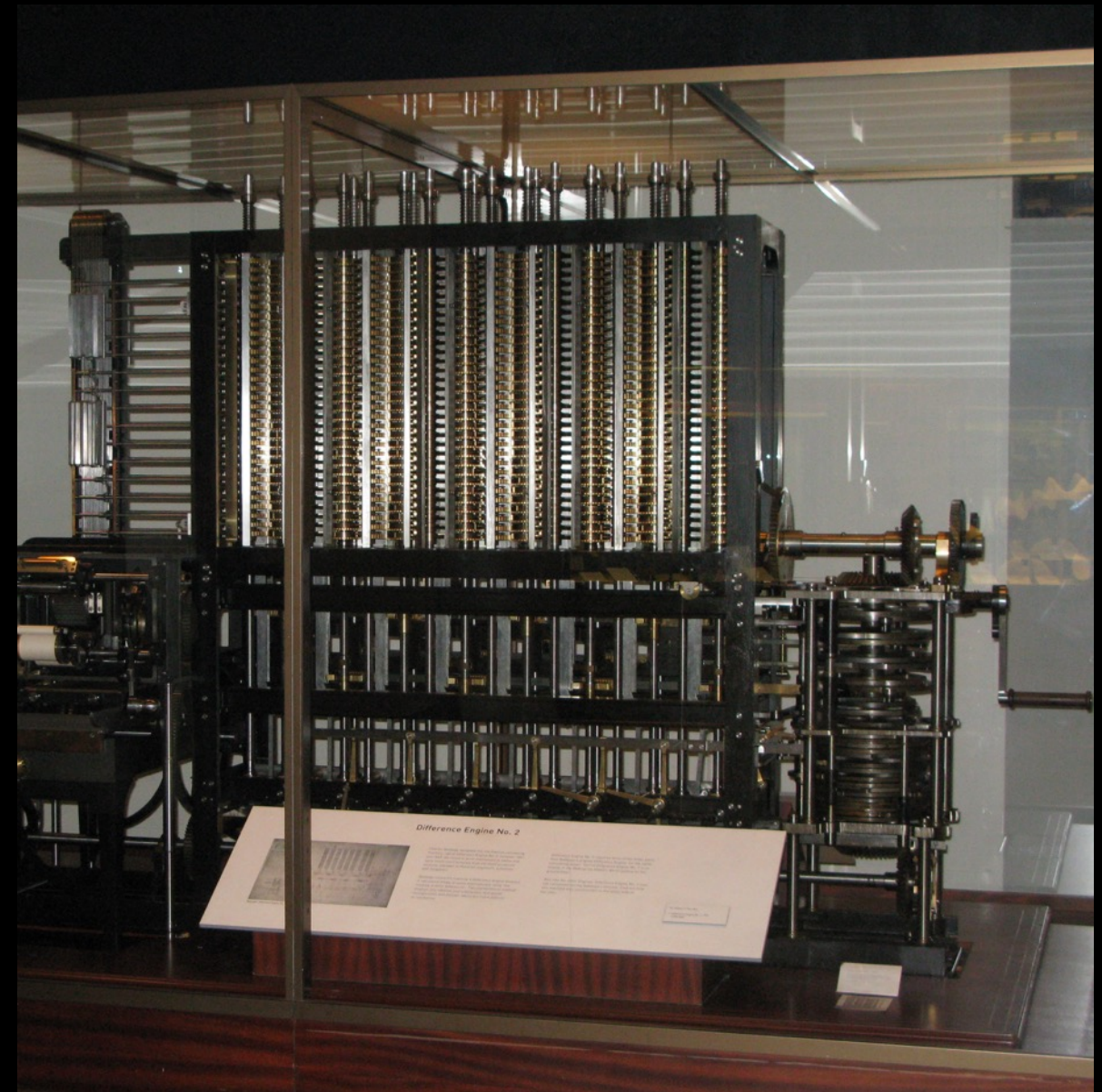
Q: What are computers?

A: Really dumb machines that are perfectly happy doing the same thing over, and over, and over, and...

COMMON LOGARITHMS $\log_{10} x$

x	0	1	2	3	4	5	6	7	8	9	Δ_m	1	2	3	4	5	6	7	8	9
											+	ADD								
10	0000	0043	0086	0128	0170	0212		0294	0334	0374	42	4	8	13	17	21	25	29	34	38
11	0414	0453	0492	0531	0569	0607		0682	0719	0755	40	4	8	12	16	20	24	28	32	36
12	0792	0828	0864	0899	0934	0969		1038	1072	1106	39	4	7	11	15	19	23	27	31	35
13	1139	1173	1206	1239	1271	1303		1367	1399	1430	37	4	7	11	14	18	21	25	28	32
14	1461	1492	1523	1553	1584	1614	1644	1673	1703	1732	35	4	7	10	13	16	20	24	27	31
15	1761	1790	1818	1847	1875	1903	1931	1959	1987	2014	34	3	7	10	13	16	20	23	26	30
16	2041	2068	2095	2122	2148	2175	2201	2227	2253	2279	33	3	7	10	13	16	20	23	26	30
17	2304	2330	2355	2380	2405	2430	2455	2480	2504	2529	32	3	6	9	12	15	18	21	24	27
18	2553	2577	2601	2625	2648	2672	2695	2718	2742	2765	30	3	6	8	11	14	17	20	22	25
19	2788	2810	2833	2856	2878	2900	2923	2945	2967	2989	28	3	5	8	10	13	16	18	21	23
20	3010	3032	3054	3075	3096	3118	3139	3160	3181	3201	26	3	5	8	10	13	16	18	21	23
21	3222	3243	3263	3284	3304	3324	3345	3365	3385	3404	25	2	5	7	10	12	15	17	20	22
22	3424	3444	3464	3483	3502	3522	3541	3560	3579	3598	24	2	5	7	10	12	14	17	19	22
23	3617	3636	3655	3674	3692	3711	3729	3747	3766	3784	22	2	4	7	9	11	13	15	18	20
24	3802	3820	3838	3856	3874	3892	3909	3927	3945	3962	21	2	4	6	8	11	13	15	17	19
25	3979	3997	4014	4031	4048	4065	4082	4099	4116	4133	20	2	4	6	8	10	12	14	16	18
26	4150	4166	4183	4200	4216	4232	4249	4265	4281	4298	19	2	4	6	8	10	11	13	15	17
27	4314	4330	4346	4362	4378	4393	4409	4425	4440	4456	18	2	4	5	7	9	11	13	14	16
28	4472	4487	4502	4518	4533	4548	4564	4579	4594	4609	17	2	3	5	7	9	10	12	14	15
29	4624	4639	4654	4669	4683	4698	4713	4728	4742	4757	16	2	3	4	6	7	9	10	12	13
30	4771	4786	4800	4814	4829	4843	4857	4871	4886	4900	15	1	3	4	6	7	8	10	11	13
31	4914	4928	4942	4955	4969	4983	4997	5011	5024	5038	14	1	3	4	6	7	8	10	11	13
32	5051	5065	5079	5092	5105	5119	5132	5145	5159	5172	13	1	3	4	5	7	8	9	10	12
33	5185	5198	5211	5224	5237	5250	5263	5276	5289	5302	12	1	3	4	5	6	8	9	10	12
34	5315	5328	5340	5353	5366	5378	5391	5403	5416	5428	11	1	3	4	5	6	7	8	10	12
35	5441	5453	5465	5478	5490	5502	5514	5527	5539	5551	10	1	2	4	5	6	7	8	10	11
36	5563	5575	5587	5599	5611	5623	5635	5647	5658	5670	9	1	2	4	5	6	7	8	10	11
37	5682	5694	5705	5717	5729	5740	5752	5763	5775	5786	8	1	2	4	5	6	7	8	10	11
38	5798	5809	5821	5832	5843	5855	5866	5877	5888	5899	7	1	2	3	4	6	7	8	9	10
39	5911	5922	5933	5944	5955	5966	5977	5988	5999	6010	6	1	2	3	4	6	7	8	9	10
40	6021	6031	6042	6053	6064	6075	6085	6096	6107	6117	5	1	2	3	4	5	7	8	9	10
41	6128	6138	6149	6160	6170	6180	6191	6201	6212	6222	4	1	2	3	4	5	6	7	8	9
42	6232	6243	6253	6263	6274	6284	6294	6304	6314	6325	3	1	2	3	4	5	6	7	8	9
43	6335	6345	6355	6365	6375	6385	6395	6405	6415	6425	2	1	2	3	4	5	6	7	8	9
44	6435	6444	6454	6464	6474	6484	6493	6503	6513	6522	1	1	2	3	4	5	6	7	8	9
45	6532	6542	6551	6561	6571	6580	6590	6599	6609	6618	0	1	2	3	4	5	6	7	8	9
46	6628	6637	6646	6656	6665	6675	6684	6693	6702	6712	9	1	2	3	4	5	6	7	8	9
47	6721	6730	6739	6749	6758	6767	6776	6785	6794	6803	8	1	2	3	4	5	6	7	8	9
48	6812	6821	6830	6839	6848	6857	6866	6875	6884	6893	7	1	2	3	4	5	6	7	8	9
49	6902	6911	6920	6928	6937	6946	6955	6964	6972	6981	6	1	2	3	4	5	6	7	8	9

No.	log	No.	log
$\pi = 3.14159$	0.49715	$\ln x = \log_e x = (1/M) \log_{10} x$	$(1/M) = 2.30259$
$e = 2.71828$	0.43429	$\log x = \log_{10} x = M \log_e x$	$M = 0.43429$
p	x	a	3
$\log e^p$	0.4343	0.8686	1.3029
$\log e^{-p}$	1.5657	1.1314	2.6971
			3.8285
			5.0588
			6.2942
			7.5299
			8.7656
			10.0013
			11.2370
			12.4727
			13.7084
			14.9441
			16.1798
			17.4155
			18.6512
			19.8869
			21.1226
			22.3583
			23.5940
			24.8297
			26.0654
			27.3011
			28.5368
			29.7725
			31.0082
			32.2439
			33.4796
			34.7153
			35.9510
			37.1867
			38.4224
			39.6581
			40.8938
			42.1295
			43.3652
			44.6009
			45.8366
			47.0723
			48.3080
			49.5437
			50.7794
			52.0151
			53.2508
			54.4865
			55.7222
			56.9579
			58.1936
			59.4293
			60.6650
			61.9007
			63.1364
			64.3721
			65.6078
			66.8435
			68.0792
			69.3149
			70.5506
			71.7863
			73.0220
			74.2577
			75.4934
			76.7291
			77.9648
			79.2005
			80.4362
			81.6719
			82.9076
			84.1433
			85.3790
			86.6147
			87.8504
			89.0861
			90.3218
			91.5575
			92.7932
			94.0289
			95.2646
			96.5003
			97.7360
			98.9717
			100.2074

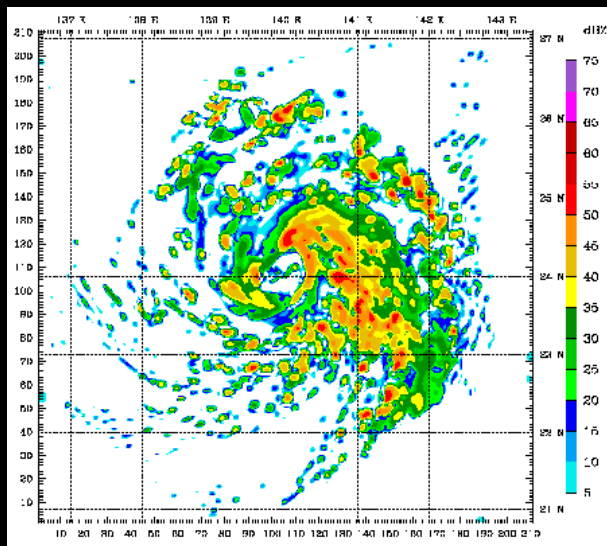


The Difference Engine No. 2
Charles Babbage, 1847

Log Tables

In repetition is power

Some applications



Weather



Music



Commerce



Medicine

...and art

```
void loop() {  
  for (int i = 0; i < PIXELS; i++) {  
    strip.setPixelColor(i, BLUE);  
    strip.show();  
    delay(10);  
  }  
  delay(500);  
  for (int i = 0; i < PIXELS; i++) {  
    strip.setPixelColor(i, WHITE);  
    strip.show();  
    delay(10);  
  }  
  delay(500);  
}
```

How non-programmers interact with computers



How programmers interact with computers: Code!

```
@RequestMapping(value = "/register", method = RequestMethod.POST)
    public String register(String userName, String password, String
confirmPassword, Model model) {

        User existingUser = userDao.findByUserName(userName);

        if (!password.equals(confirmPassword)) {
            return this.displayError("Passwords do not match. Try again.",
model);
        } else if (existingUser != null) {
            return this.displayError(
                "The username " + userName + " already exists in the
system. Please select a different username", model);
        }

        User newUser = new User(userName, password);
        userDao.save(newUser);
        return "index";
    }
```

But! But!

Computers don't think in code.

They think in **binary**.

So, what is binary?

Some examples of “Hello, World!”

```
#include <iostream>
public class Hello {
    public static void main(String []args) {
        System.out.println("Hello World");
    }
}

std::cout << "Hello, World.";
```


computer program:

A set of instructions in a given programming language

Characteristics of computer programs

- Execute one instruction at a time
- Allow reuse of subsets of instructions
- Can make decisions
- Can store data in “buckets” for use later, and can use the values in those buckets without caring about the specific value
- Can be made up of many algorithms

Computers are very explicit

The children made delicious snacks.



Set up your accounts

- Codecademy: Visit [codecademy.com](https://www.codecademy.com) in your browser and sign up
- Piazza: piazza.com

Javascript Basics

Syntax is the term used to describe the set of rules that make up a programming language

If we don't follow those rules, the computer can't run our code. We say there is "syntax error"

Data Types

Variables have “data types,” which is a fancy way of saying that there are different kinds of things that can be stored in a variable, and those things are often treated differently.

Data Types

- Number: 2, 78, -2, 3.5, 3.14159
- String: “Hello, World!”, ‘LaunchCode’
- Boolean: true, false

Variables

A variable stores a value (number, letter, word, etc) that we can use and update later

```
var numberOfBurritos = 2;
```

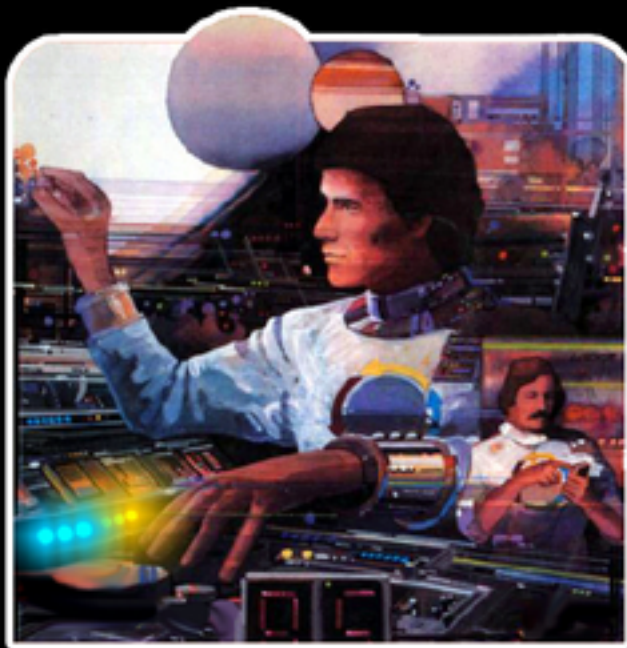
```
var launchcodeAddress = "4811  
Delmar Blvd";
```

```
var isWeekend = true;
```

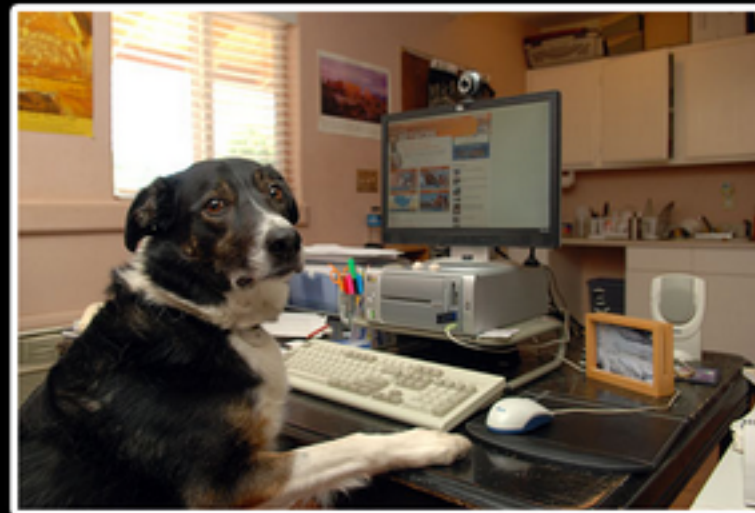
What is code?

<https://vimeo.com/130987431>

THE TWO STATES OF EVERY PROGRAMMER



I AM A GOD.



**I HAVE NO IDEA
WHAT I'M DOING.**

Course Resources

- <http://education.launchcode.org/HelloWorld/>
- Piazza
- Email - chris@launchcode.org