

CS50x Educator Workshop



KF
@knightfñan

I took CS50.

iC

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ND

Notre Dame College

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I took CS50.

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bubble sort







IM Phandeeyar
#accelerateMM Phan
#socialimpactMM Phandeeyar
#acc Phandeeyar
1M Phandeeyar
#acceler MM Phan
#soc Phandeeyar
#so

TECH
COMMUNITY
IMPACT

Phan
dee
var

Phandeeyar
ACCELERATOR



This is CS50 UTEPSA 2016

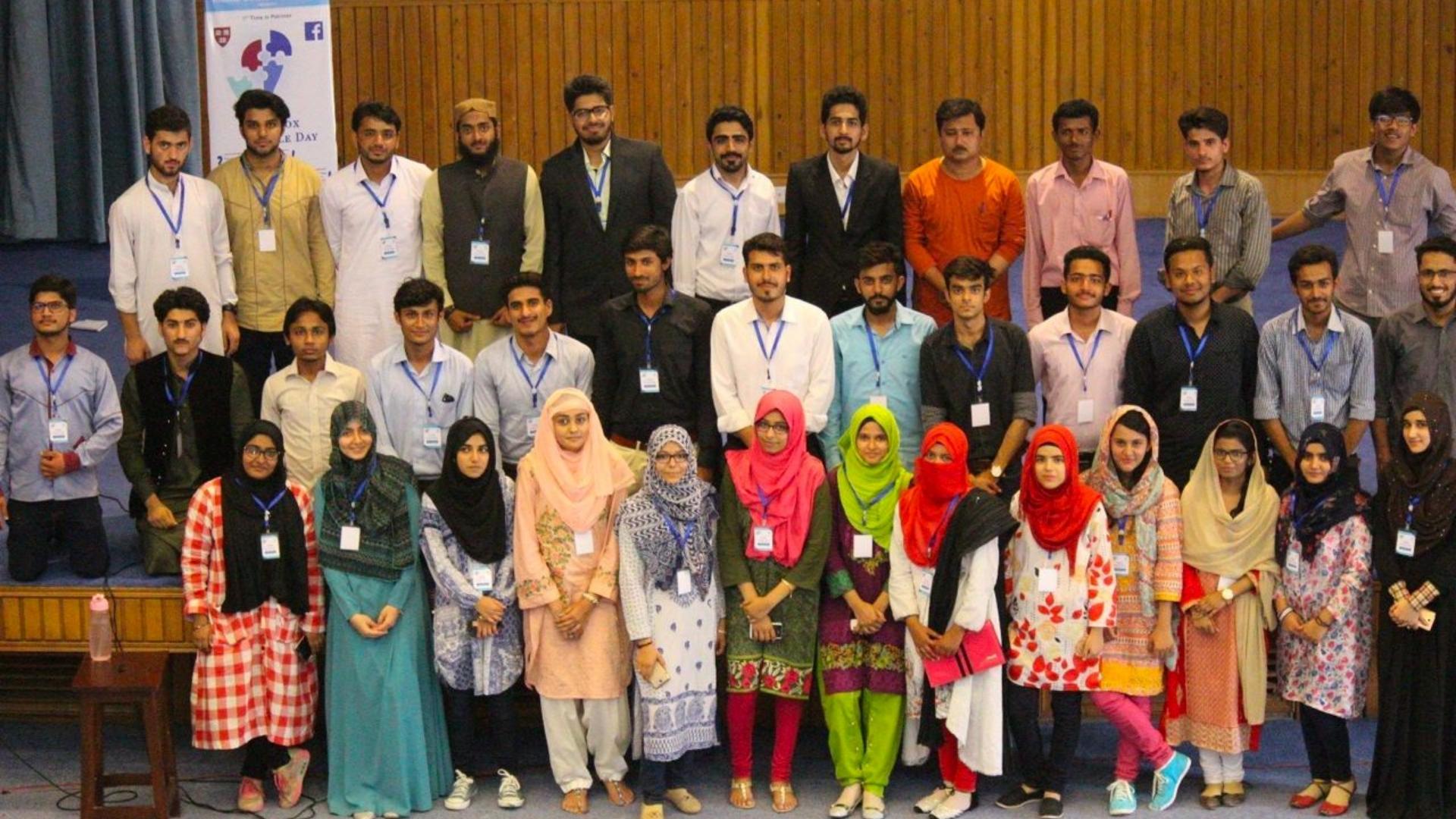


This is CS50

Nicaragua









C550x Puzzle Day 2017





Teaching CS50x

An overview of curricular resources

Schedule

- Teaching CS50x: An overview of curricular resources
- CS50's Tools: What they are and how to use them
- CS50's Tools for Submitting and Grading
- Grading Programming Assignments, Handling Academic Honesty
- Writing Assessments: Labs, quizzes, and other assignments
- How to Teach CS50B (CS in Business), CS50L (CS in Law), or CS50T (Technology)
- How to Teach CS50G (Game Development)
- How to Teach CS50W (Web Programming)
- How to Teach CS50AI (Artificial Intelligence)



Breakout Group

1. Who and where are you?
2. What are you excited about?
3. What are you nervous about?

Teaching CS50x

An overview of curricular resources

What's What

- CS50
- CS50x

CS50

CS50

Accessibility, Rigor, Community

CS50x

cs50.harvard.edu/x

CS50x

cs50.edx.org

What's Included

- Content
- Software
- Events

Content

- Lectures, Sections
- Shorts
- Problem Sets, Walkthroughs
- Quizzes, Test

Lectures, Sections

- Scratch
- C
- Arrays
- Algorithms
- Memory
- Data Structures
- Python
- SQL
- Information
- HTML, CSS
- JavaScript
- Hardware
- Internet
- Multimedia
- Security

Shorts

- AJAX
- Administrivia
- Algorithms Summary
- Arrays
- Binary Search
- Bubble Sort
- CSS
- Call Stacks
- Command Line
- Command Line Arguments
- Computational Complexity
- Conditional Statements
- DOM
- Data Structures
- Data Types
- Debugging
- Defining Custom Types
- Doubly-Linked Lists
- Dynamic Memory Allocation
- File Pointers
- Flask
- Functions
- GDB
- HTML
- HTTP
- Hash Tables
- Hexadecimal
- IDE
- IP
- Insertion Sort
- Internet Primer
- JavaScript
- Linear Search
- Loops
- MVC
- Magic Numbers
- Merge Sort
- Operators
- Pointers
- Python
- Queues
- Recursion
- SQL
- Selection Sort
- Singly-Linked Lists
- Stacks
- Structures
- TCP
- Tries
- Variables and Scope

Problem Sets, Walkthroughs

- Scratch
- Hello
- Mario
- Cash
- Credit
- Readability
- Caesar
- Substitution
- Plurality
- Runoff
- Tideman
- Filter
- Recover
- Speller
- DNA
- Movies
- Houses
- Homepage
- Finance
- Fahrenheit
- ISBN
- Pennies
- Old Friends
- Calc
- Vigenère
- Crack
- Fifteen
- Whodunit
- Resize
- Defender of the Web
- Be the Teacher
- Sentimental
- Bleep
- Similarities
- Survey
- Around the House
- Tech Spot
- Everyday Algorithms
- Me, myself, and UI

Quizzes, Test

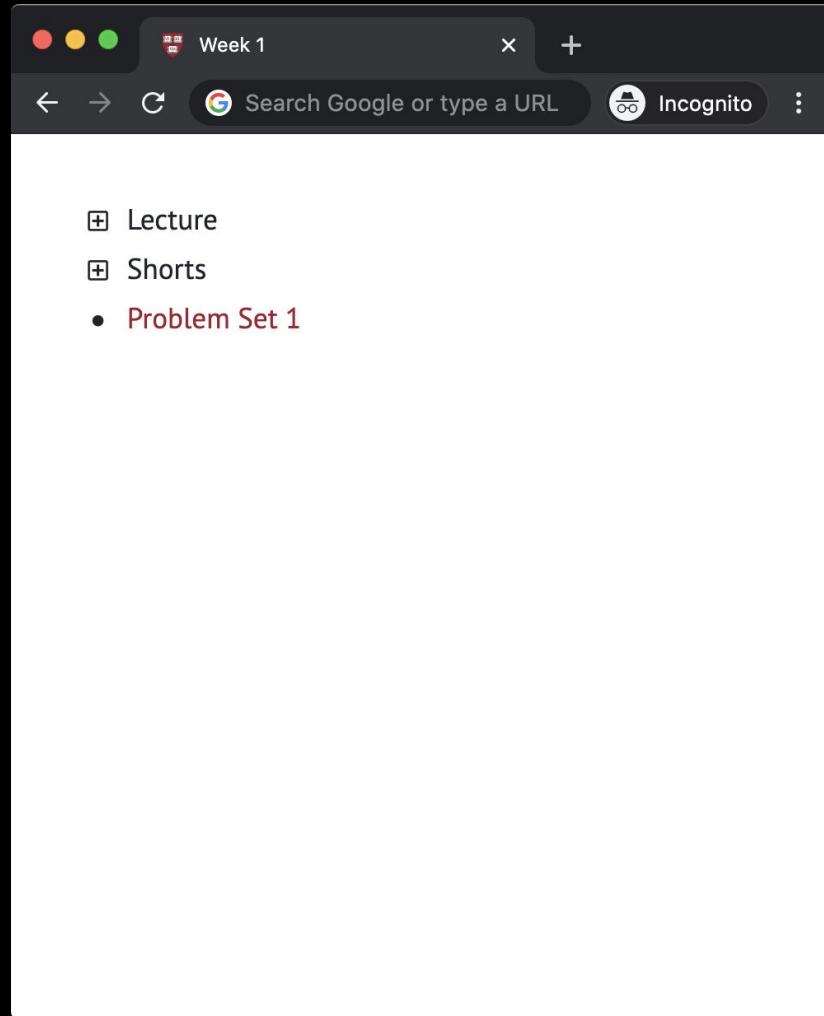
- An Exclusive
- Assembly Line
- Bit by Bitcoin
- Count on It
- File Browser
- Hey, Earl
- Key Questions
- Less is More
- Random Questions
- Teetering on the Edge
- ...

OpenCourseWare

Adopt or Adapt







The image shows a screenshot of a web browser window. The title bar at the top reads "Week 1". Below the title bar is a toolbar with standard navigation icons (back, forward, search, etc.) and a search bar containing the placeholder text "Search Google or type a URL". To the right of the search bar are "Incognito" and other menu options. The main content area of the browser displays a hierarchical menu structure:

- Lecture
 - Audio
 - Notes
- ⊕ Slides
- ⊕ Source Code
- ⊕ Video
- ⊕ Shorts
- Problem Set 1

The image shows a screenshot of a web browser window. The title bar at the top reads "Week 1". Below the title bar is a toolbar with standard navigation icons (back, forward, search, etc.) and a "Search Google or type a URL" input field. To the right of the search field are "Incognito" and other menu options. The main content area displays a hierarchical navigation menu:

- Lecture
 - Audio
 - Notes
- Slides
 - Google Slides
 - PDF
- ⊕ Source Code
- ⊕ Video
- ⊕ Shorts
 - Problem Set 1

The image shows a screenshot of a web browser window. The title bar at the top reads "Week 1". Below the title bar is a toolbar with standard navigation icons (back, forward, search, etc.) and a "Search Google or type a URL" input field. To the right of the search field are "Incognito" and other menu options. The main content area displays a hierarchical menu:

- Lecture
 - Audio
 - Notes
- ⊕ Slides
- Source Code
 - Index
 - PDF
 - Zip
- ⊕ Video
- ⊕ Shorts
- Problem Set 1

The screenshot shows a dark-themed web browser window. At the top, there are three circular control buttons (red, yellow, green) on the left, followed by a title bar with the text "Week 1" and a red square icon. To the right of the title bar are standard window controls: a close button (X), a minimize button (-), and an maximize button (+). Below the title bar is a toolbar with a back arrow, a forward arrow, a refresh button, a Google search bar containing the placeholder "Search Google or type a URL", an "Incognito" mode button, and a more options button (three dots).

The main content area displays a hierarchical navigation menu:

- Lecture
 - Audio
 - Notes
- ⊕ Slides
- ⊕ Source Code
- Video
 - CS50 Video Player
 - ⊕ MP4
 - YouTube
- ⊕ Shorts
- Problem Set 1

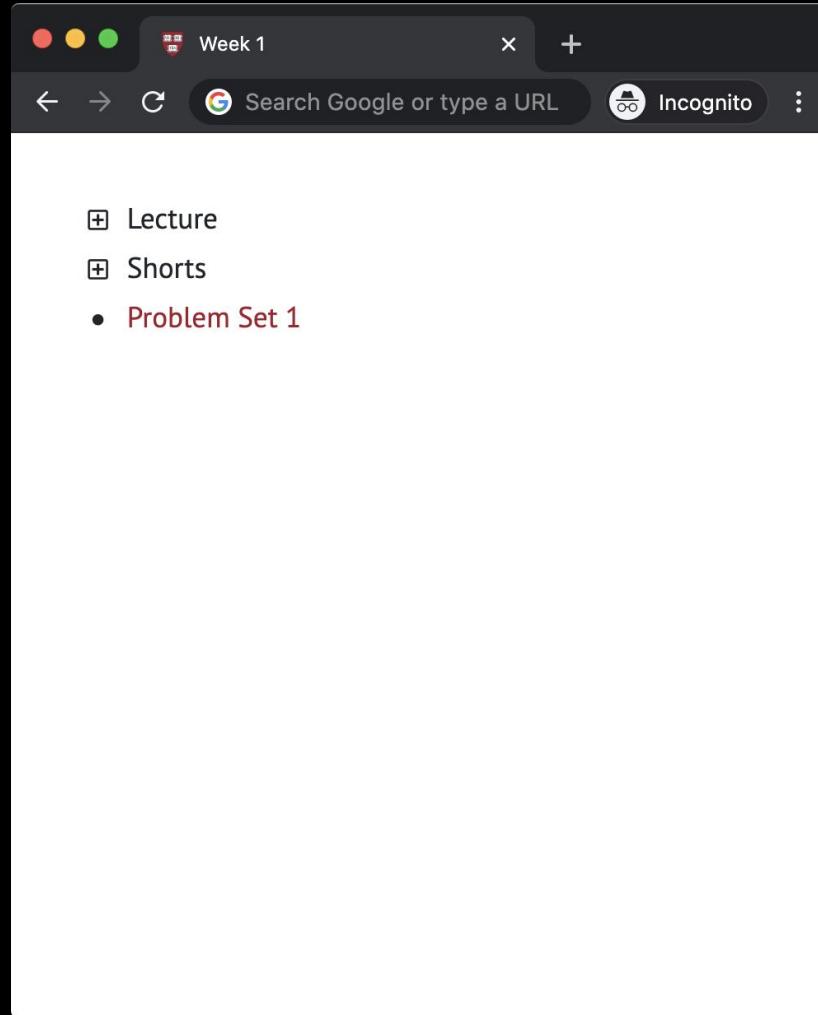
Week 1

Search Google or type a URL Incognito

- Lecture
 - Audio
 - Notes
- ⊕ Slides
- ⊕ Source Code
- Video
 - CS50 Video Player
 - MP4
 - 360p
 - 720p
 - 1080p
 - 4K
 - YouTube
- ⊕ Shorts
- Problem Set 1

The image shows a screenshot of a web browser window. The title bar at the top reads "Week 1". Below the title bar is a toolbar with standard navigation icons (back, forward, search, etc.) and a "Search Google or type a URL" input field. To the right of the search field are "Incognito" and three-dot menu icons. The main content area of the browser displays a navigation menu:

- ⊕ Lecture
- ⊖ Shorts
 - 1. Data Types
 - 2. Operators
 - 3. Conditional Statements
 - 4. Loops
 - 5. Command Line
- Problem Set 1



Software

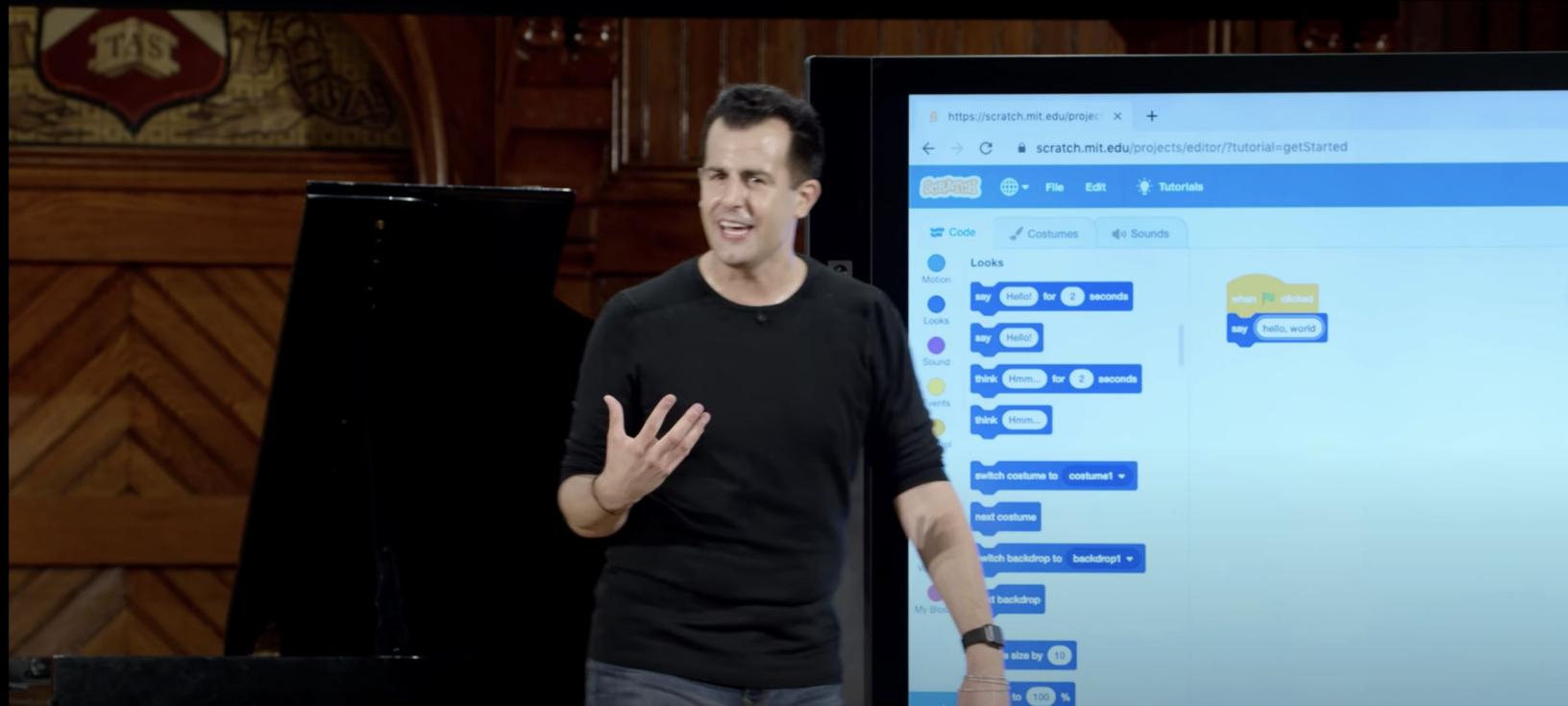
- CS50 Video Player
- CS50 Sandbox
- CS50 Lab
- CS50 IDE
 - help50
 - debug50
 - check50
 - style50
 - render50
- CS50 Render
- cli50

CS50 Video Player

CS50 2019 - Lecture 0 - Comp

video.cs50.io/jjqgP9dpD1k?screen=w3XNssqYBSU&start=2098

CS50 Video Player Screen Shortcuts Snacks Chapters Captions

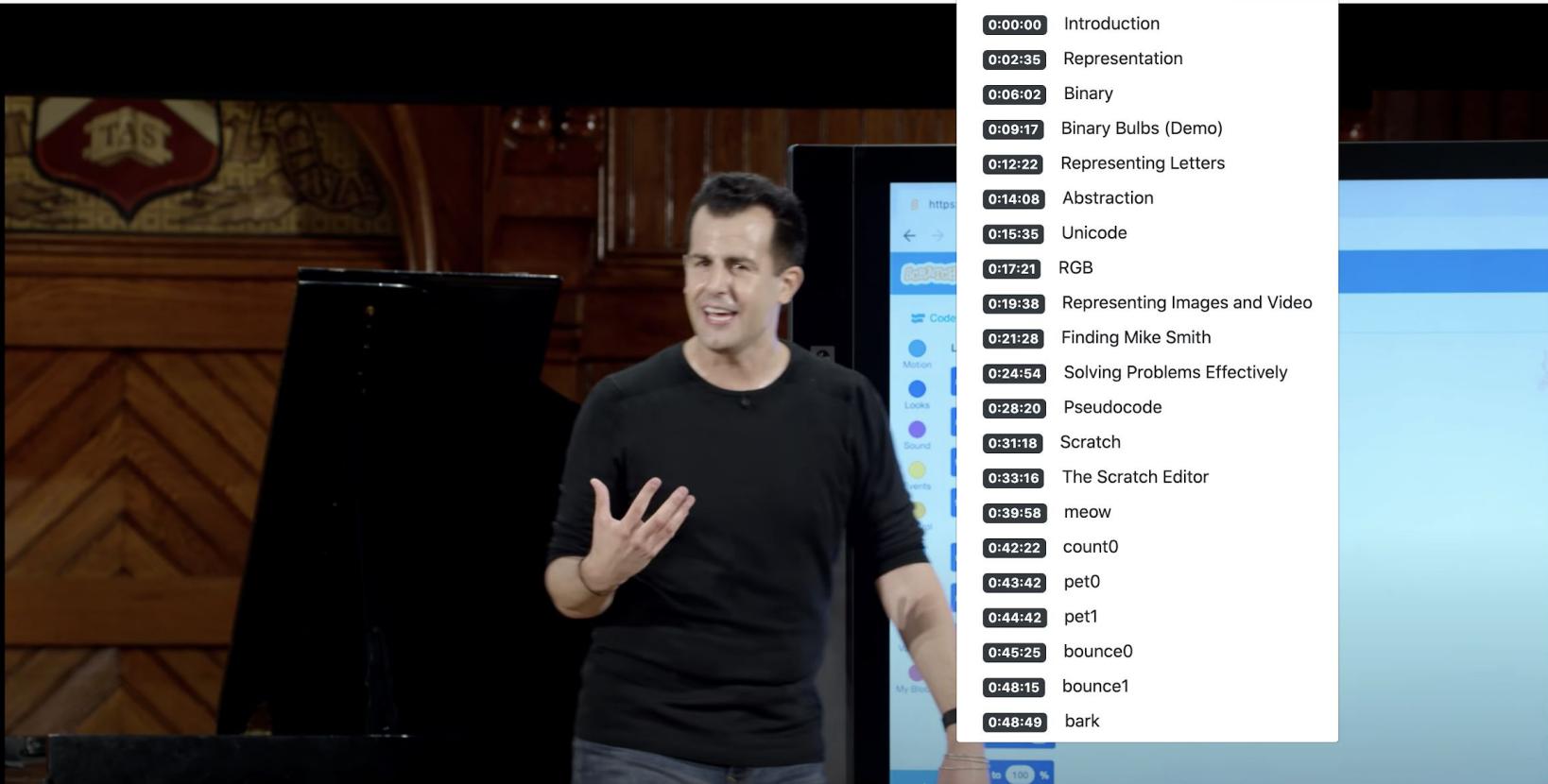


CS50 2019 - Lecture 0 - Comp

video.cs50.io/jjqgP9dpD1k?screen=w3XNssqYBSU&start=2098

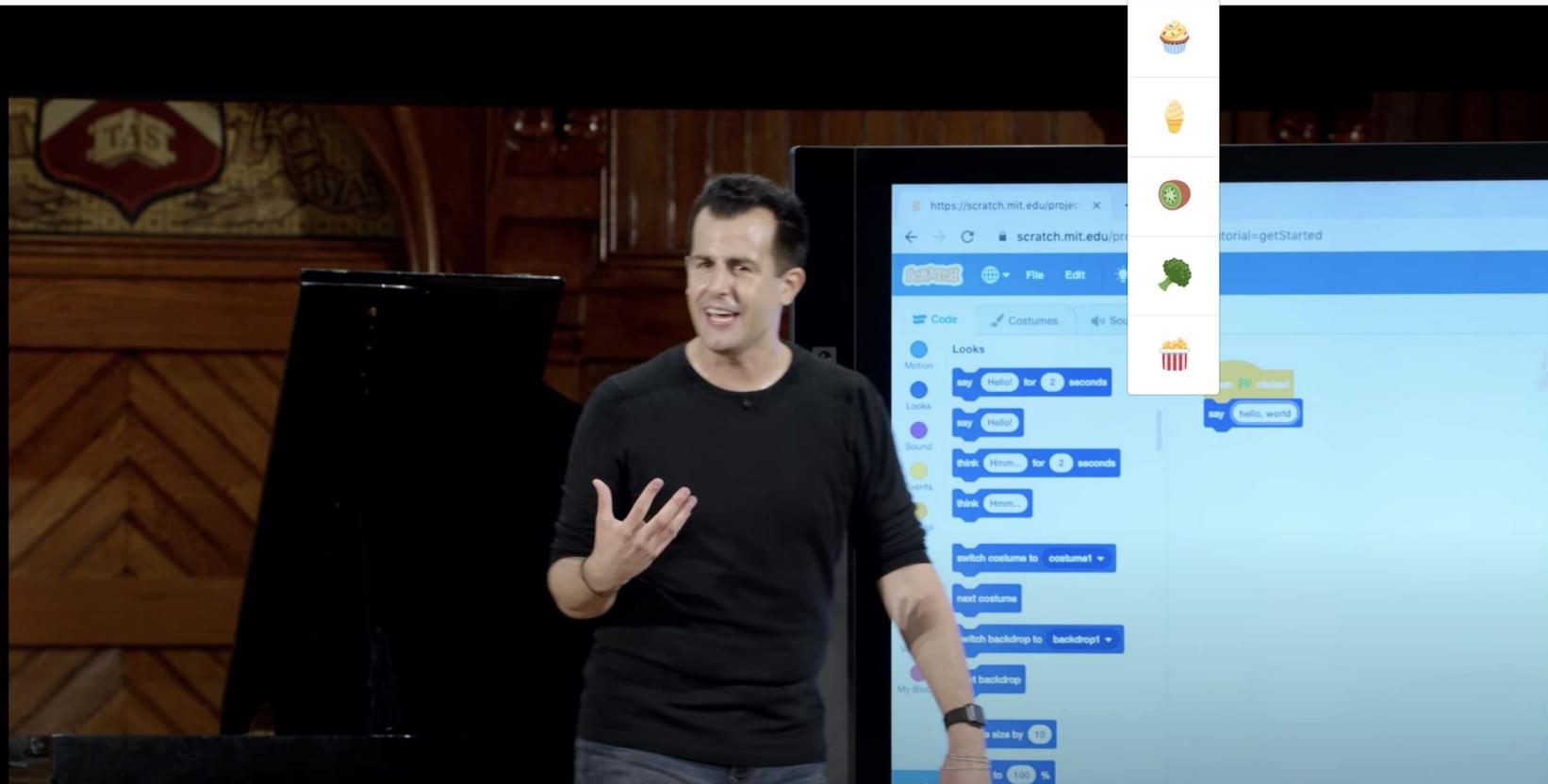
CS50 Video Player Screen

Shortcuts Snacks Chapters Captions





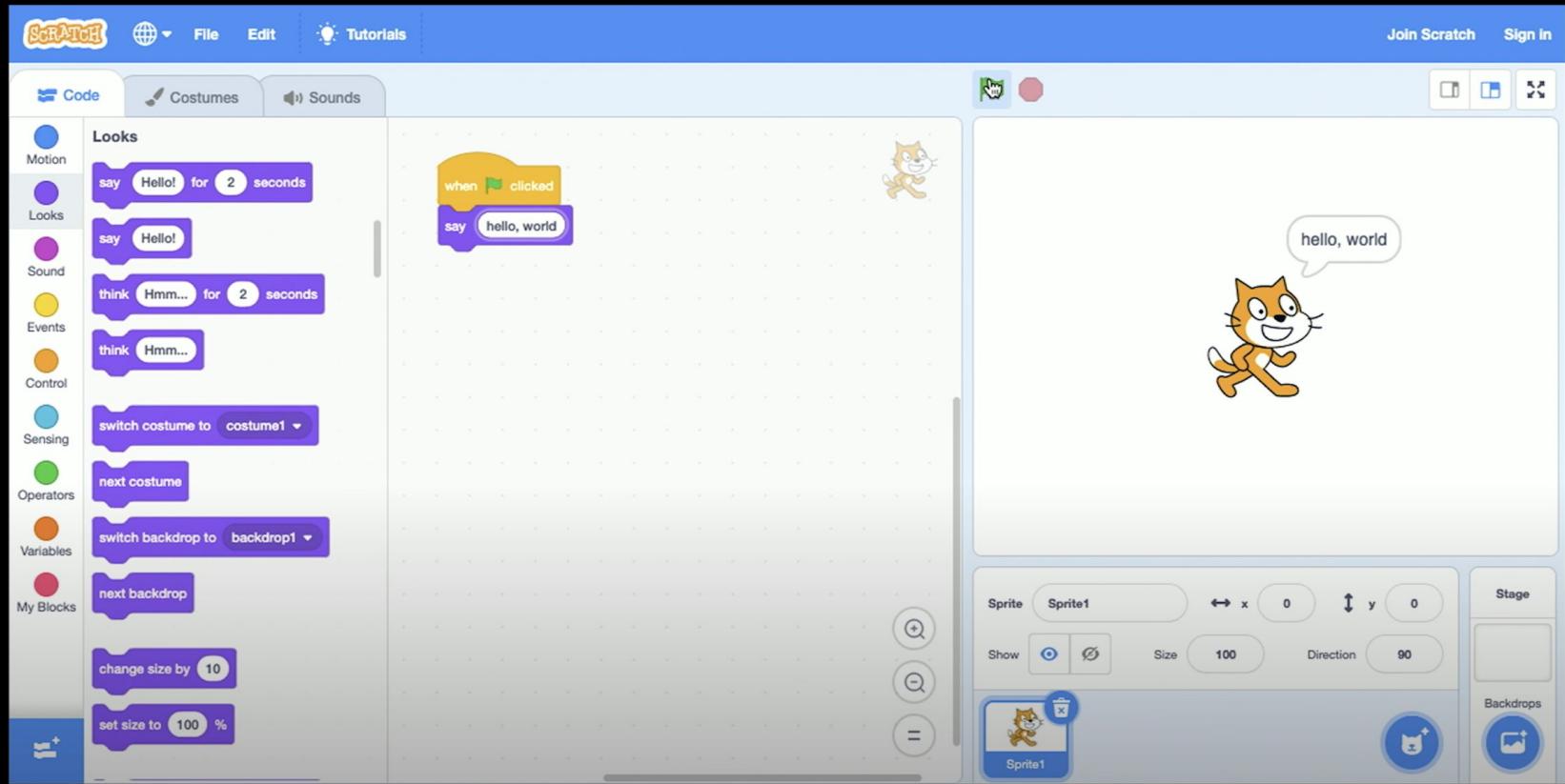
0:34:51 Very low bar so far, but we'll improve upon this next
0:34:54 because this cat is pretty inanimate and is just now saying hello.
0:34:58 What if we wanted him to do more than that and say not hello, but hello to me
0:35:02 or hello to you?
0:35:03 Well, it turns out we can do this a little differently, as well.
0:35:05 I'm going to go ahead and throw this away by just dragging it over
0:35:08 on the left.
0:35:09 And the puzzle piece just goes away.
0:35:11 And if I poke around a little further under these blue blocks,
0:35:13 for instance, Sensing, there's a bunch of puzzle pieces
0:35:16 related to Scratch's environment.
0:35:18 And one of those is this one here, ask, what's your name?
0:35:21 And wait.
0:35:22 But that what's your name expression is in a white box
0:35:24 that I can actually change.
0:35:25 So you can ask any questions you want, but I'll go ahead and use that default.
0:35:29 And now notice also over here in blue is Answer,
0:35:32 which is another circular shape which represents what we're
0:35:35 going to start calling a variable.
0:35:36 That variable is going to store whatever the human types in when
0:35:40 asked for his or her name.



CS50 2019 - Lecture 0 - Comp

video.cs50.io/jjqgP9dpD1k?screen=w3XNssqYBSU&start=2098

CS50 Video Player Screen Shortcuts Snacks Chapters Captions



CS50 Sandbox

n. CS50 Sandbox

← → C sandbox.cs50.io

☆ Incognito ::

CS50 Sandbox

temporary programming environments for students and teachers

with support for [these environments](#)

[Create sandbox](#) [Recent sandboxes](#)

with **embedded browser**

with **terminal window**

with **text editor**, [with these tabs](#)

with **X window**

[Create](#) or [configure](#)

n. CS50 Sandbox

← → C 🔒 sandbox.cs50.io/ca9a78c0-1d84-4ac6-8a29-5bdb752f0db6

Share

hello.c

```
1 #include <stdio.h>
2
3 int main(void)
4 {
5     printf("hello, world\n");
6 }
7
```

>_ Terminal

```
$ make hello
```

CS50 Lab

Mario - CS50 Lab

lab.cs50.io/cs50/labs/2019/fall/mario/less/

Incognito

Mario

World 1-1

Toward the end of World 1-1 in Nintendo's Super Mario Brothers, Mario must ascend right-aligned pyramid of blocks, a la the below.



Let's recreate that pyramid in C, albeit in text, using hashes (#) for bricks, a la the

CS50 Lab

Logged in as student50. Log out.

Reset

mario.c pseudocode.txt

```
1 #include <cs50.h>
2 #include <stdio.h>
3
4 int main(void)
5 {
6
7 }
```

>_ Terminal

```
$
```

CS50 IDE

The screenshot shows the CS50 IDE interface on a Mac OS X system. The title bar reads "CS50 IDE" and the address bar shows the URL "ide.cs50.io". The main menu includes "File", "Edit", "Find", "View", and "Go". On the right side, there are "Share" and "Incognito" buttons, along with a user profile picture of a cat.

The left sidebar shows a file tree with a folder icon and the path "~/". Inside the folder, there is a file icon labeled "hello.c".

The central workspace contains a code editor with the following C code:

```
#include <stdio.h>
int main(void)
{
    printf("hello, world\n");
}
```

Below the code editor is a terminal window with the following command:

```
~/ $ make hello
```

On the right side of the interface, there are three tabs: "Collaborate", "Outline", and "Debugger".

CS50 Render

CS50 Render

render.cs50.io

Incognito

CS50 Render

Generates syntax-highlighted PDFs of source code. Read [documentation](#). See [hello.pdf](#) and [hellos.pdf](#) for examples.

letter landscape ▾

Choose Files

hello.pdf

render.cs50.io/hello.pdf

hello.pdf

1 / 1

hello.c

```
1 // A program that says hello to the world
2
3 #include <stdio.h>
4
5 int main(void)
6 {
7     printf("hello, world\n");
8 }
```

++

+

-

hellos.pdf

render.cs50.io/hellos.pdf

Incognito

hellos.pdf 1 / 1

hello.c

```
1 // A program that says hello to the world
2
3 #include <stdio.h>
4
5 int main(void)
6 {
7     printf("hello, world\n");
8 }
```

hello.py

```
1 # A program that says hello to the world
2
3 print("hello, world")
```

Events

- CS50 Puzzle Day
- CS50 Hackathon
- CS50 Fair

CS50 Puzzle Day



MAIN PARTNER
WIX.com

PARTNER

GAMER

REAL

PUZZLE DAY

CSSOFTGLOBAL

2018







CS50 Hackathon

This is CS50X.ni







Miami Dade
College

cloud



CS

50

CS

50

apple
MUSIC

CS50
Proud

CS50
Proud

CS50
Proud

CS50
Proud

CS50 Fair



Michael Long Zhang
Ridder '23











Photos, Videos

Communities

- cs50x.slack.com
- discord.gg/cs50
- facebook.com/cs50
- facebook.com/groups/cs50
- github.com/cs50
- gitter.im/cs50/x
- instagram.com/cs50
- linkedin.com/groups/7437240
- linkedin.com/school/cs50
- quora.com/topic/CS50
- snapchat.com/add/cs50
- twitter.com/cs50
- youtube.com/cs50

CS50 Certificates

certificates.cs50.io

A CS50 Certificate

CS50 congratulates

John Harvard

on completion of CS50x,
including nine problem sets and one final project.

Awarded from Cambridge, Massachusetts,
in the year two thousand twenty.

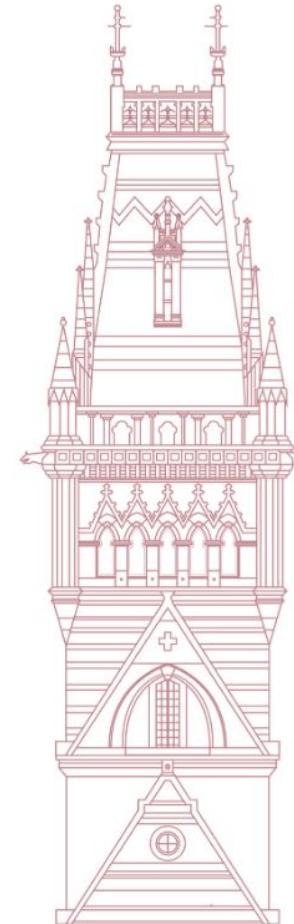


David J. Malan

Gordon McKay Professor of the Practice of Computer Science
Harvard University



<https://cs50.harvard.edu/certificates/89b2b9db-75fb-4baf-b0cd-8d9fc843d6e0>



teachers@lists.cs50.harvard.edu

Questions

outreach@cs50.harvard.edu

Feedback

cs50.ly/feedback

Teaching CS50x

An overview of curricular resources