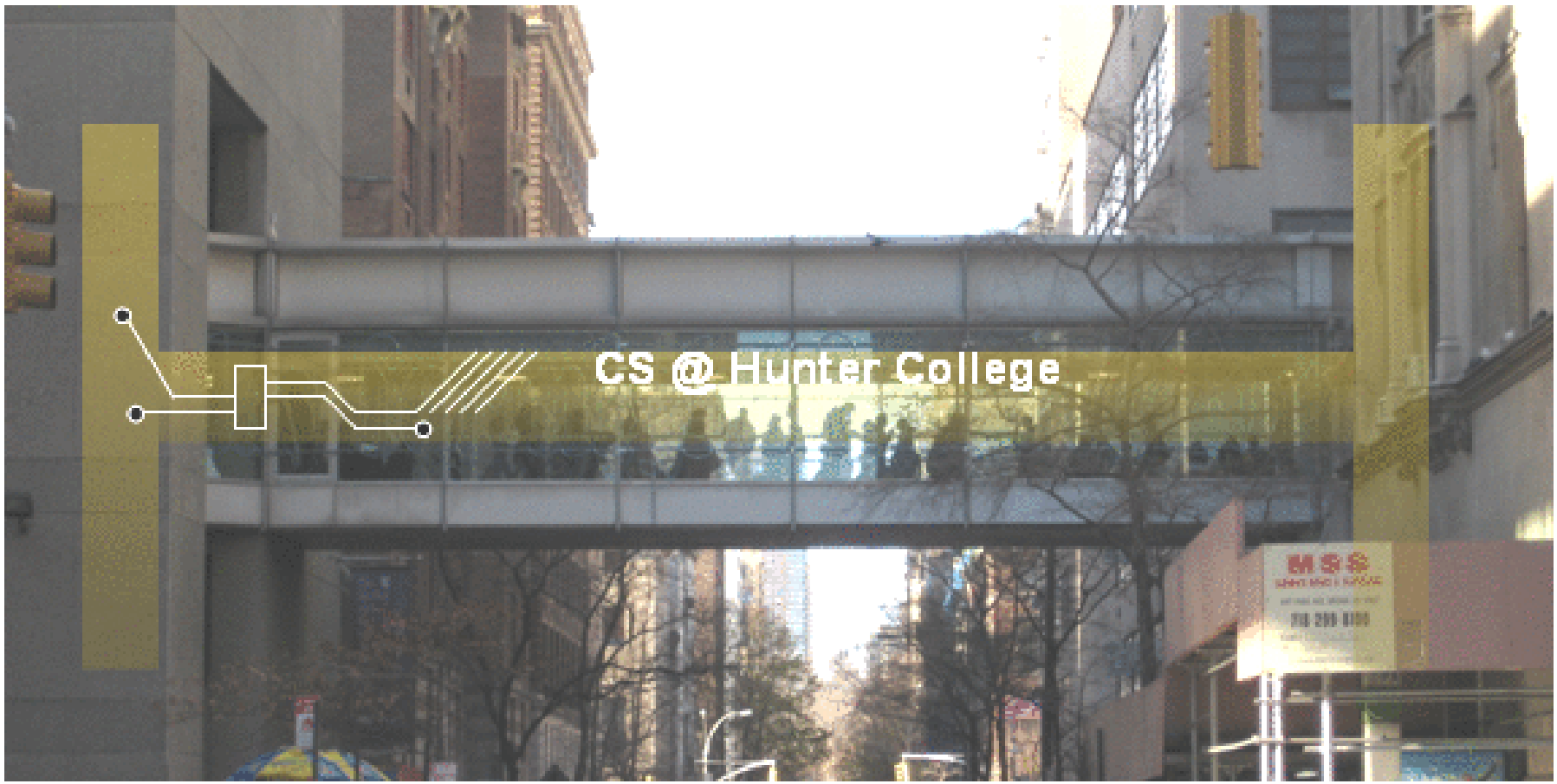
CSci 127: Introduction to Computer Science



hunter.cuny.edu/csci

Frequently Asked Questions

From lecture slips & recitation sections.

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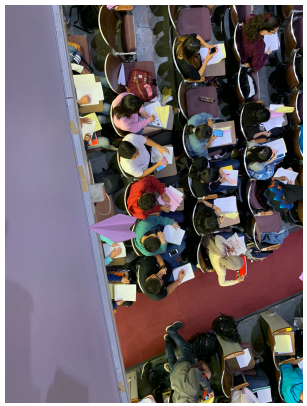

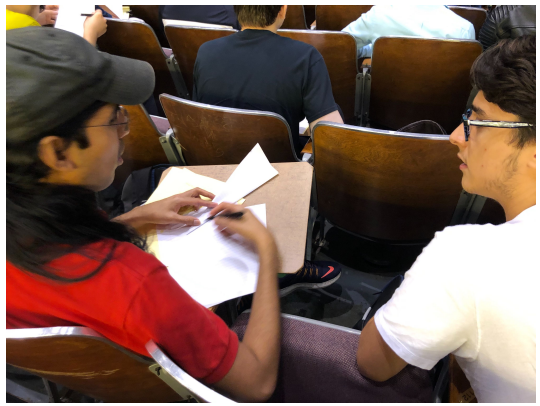
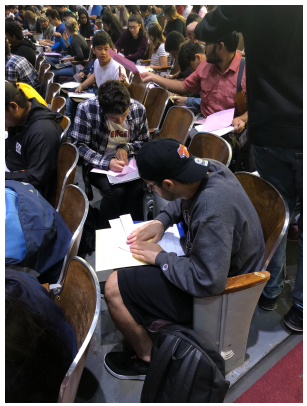

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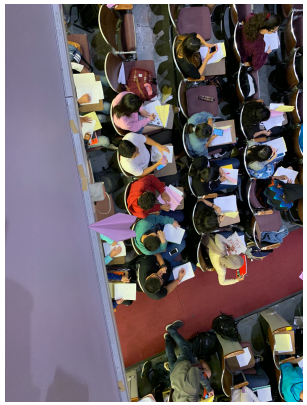

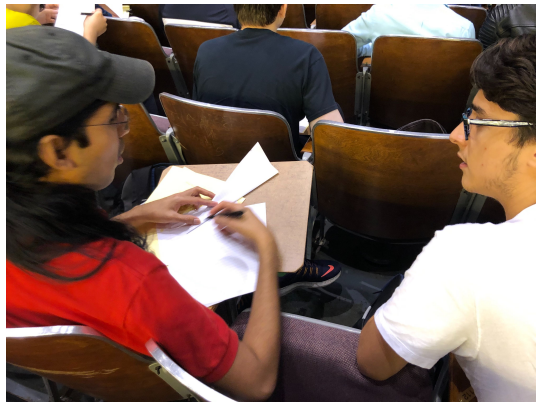
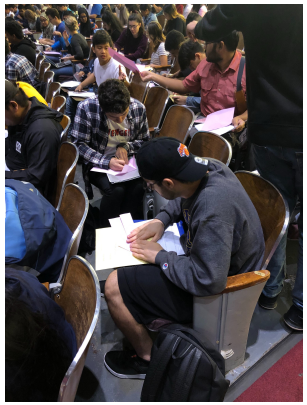

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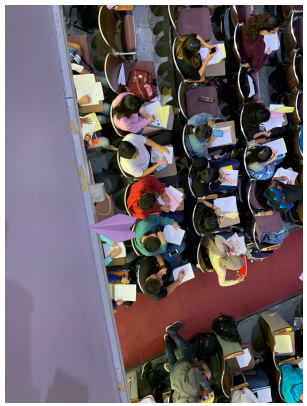

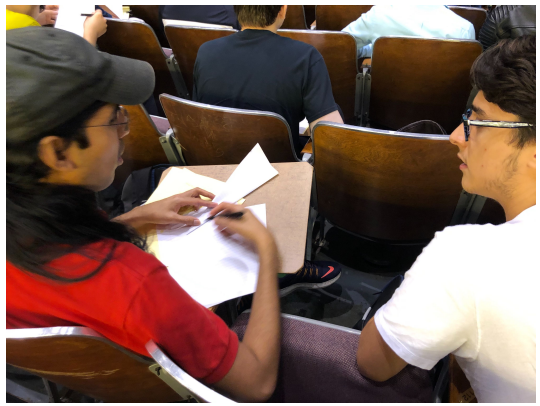
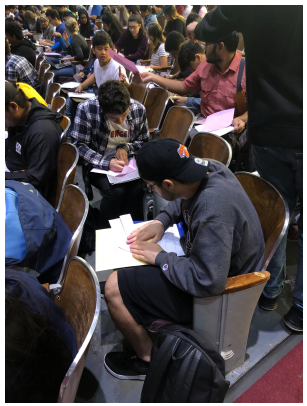

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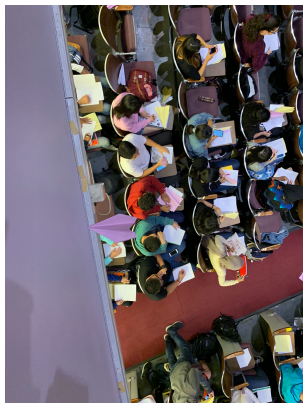

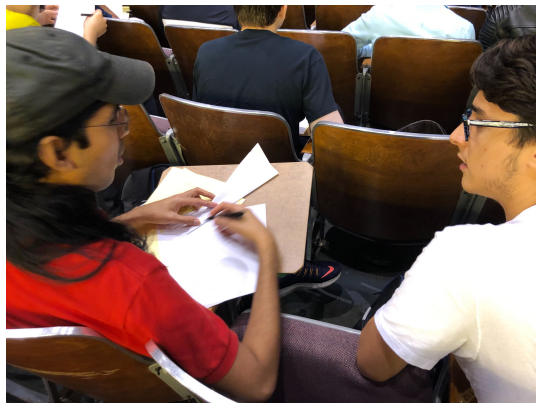
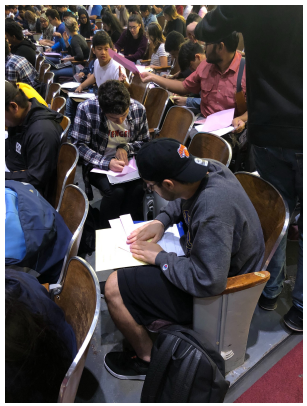

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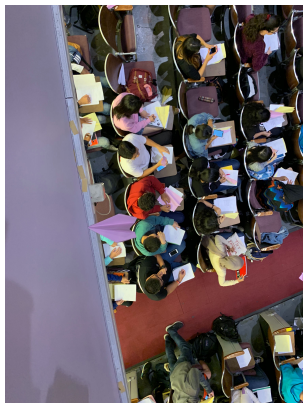

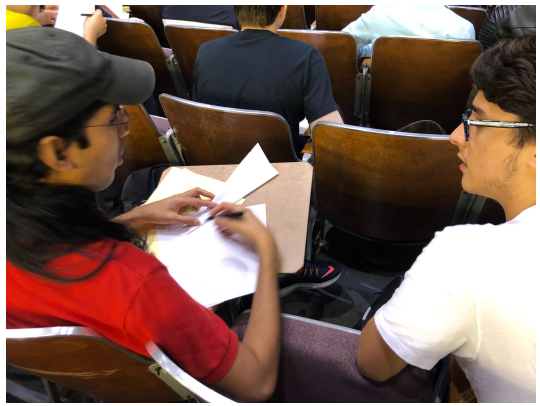
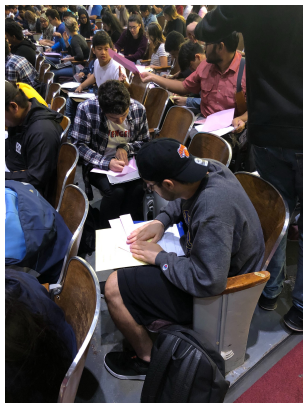

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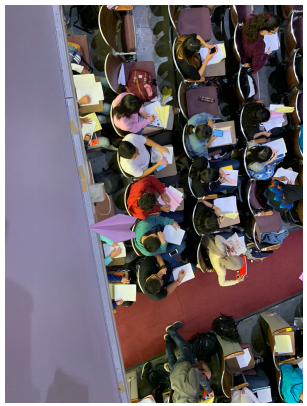

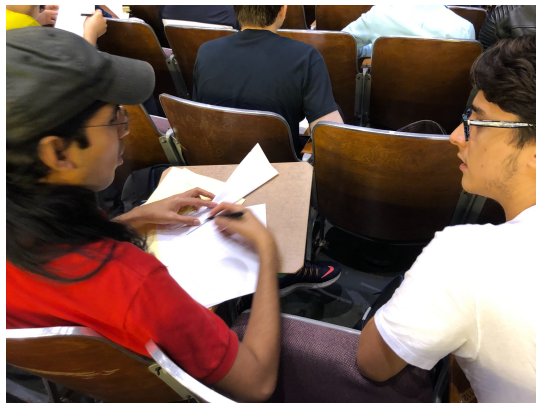
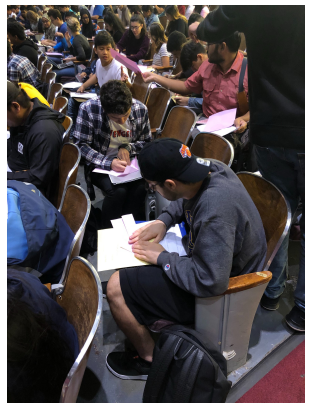

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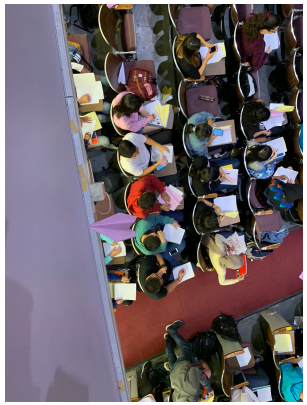

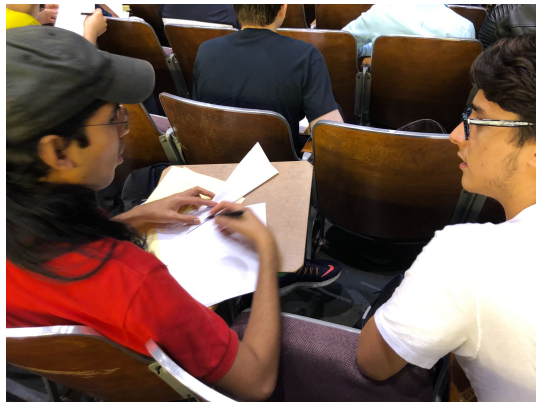
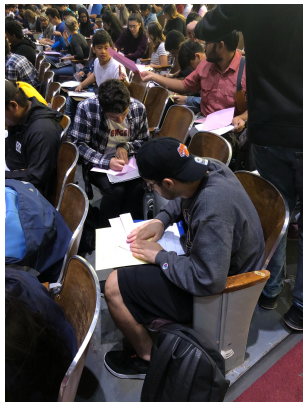

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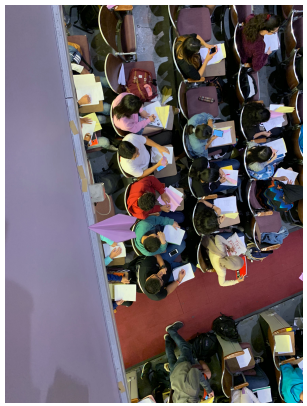

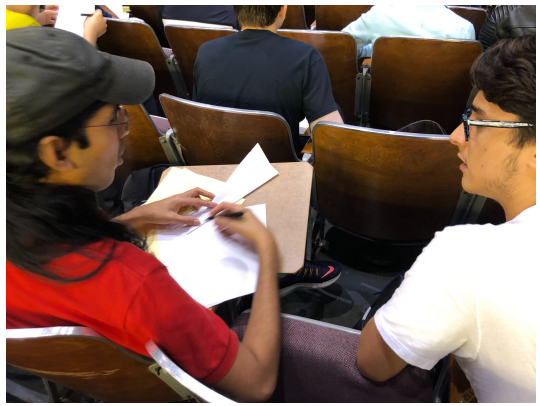
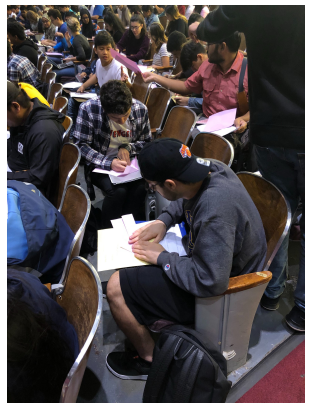

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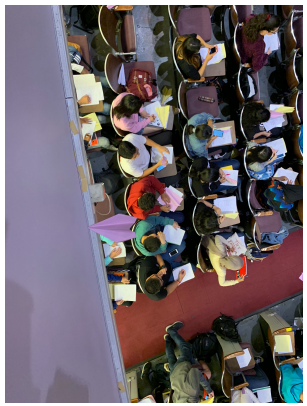

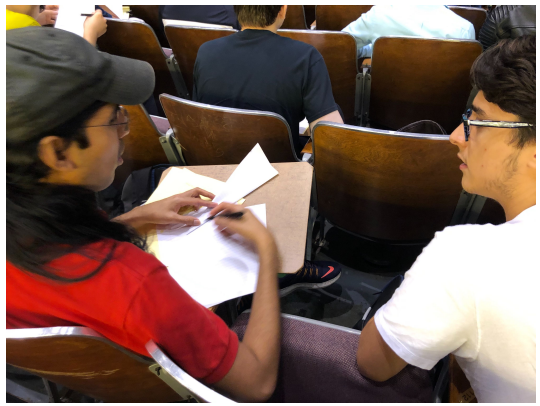
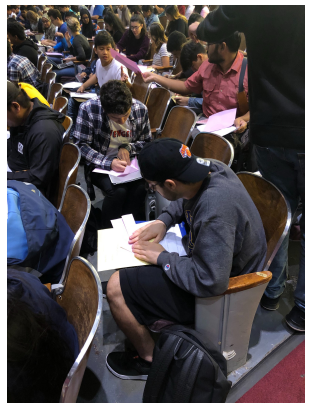

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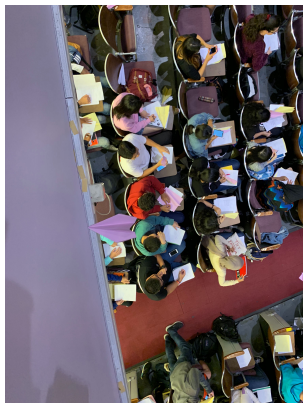

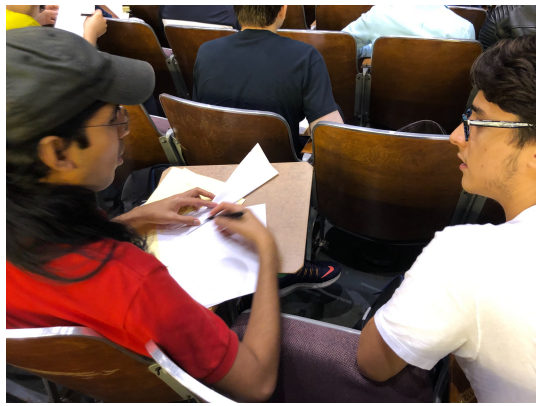
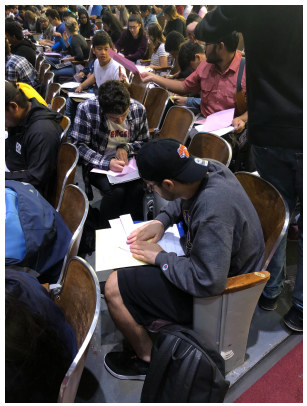

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    - ★ communicating and working in teams.

Plane Winners

Come claim your prizes after lecture:

Design Team:	*Build Team:*
Irene, Alisha, Charlie,	*(empty)*
(empty)	Shirley, Amanda
Kanglu, Ling, Xihao, Yaohoa	*(empty)*

Today's Topics

- Recap: Decisions
- Logical Expressions
- Circuits
- Binary Numbers
- CS Survey

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In Pairs or Triples...

Some challenges with types & decisions:

```
#What are the types:
y1 = 2017
y2 = "2018"
print(type(y1))
print(type("y1"))
print(type(2017))
print(type("2017"))
print(type(y2))
print(type(y1/4.0))

x = int(y2) - y1
if x < 0:
    print(y2)
else:
    print(y1)
```

```
cents = 432
dollars = cents // 100
change = cents % 100
if dollars > 0:
    print('$'+str(dollars))
if change > 0:
    quarters = change // 25
    pennies = change % 25
    print(quarters, "quarters")
    print("and", pennies, "pennies")
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Python Tutor

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(Demo with pythonTutor)

Decisions

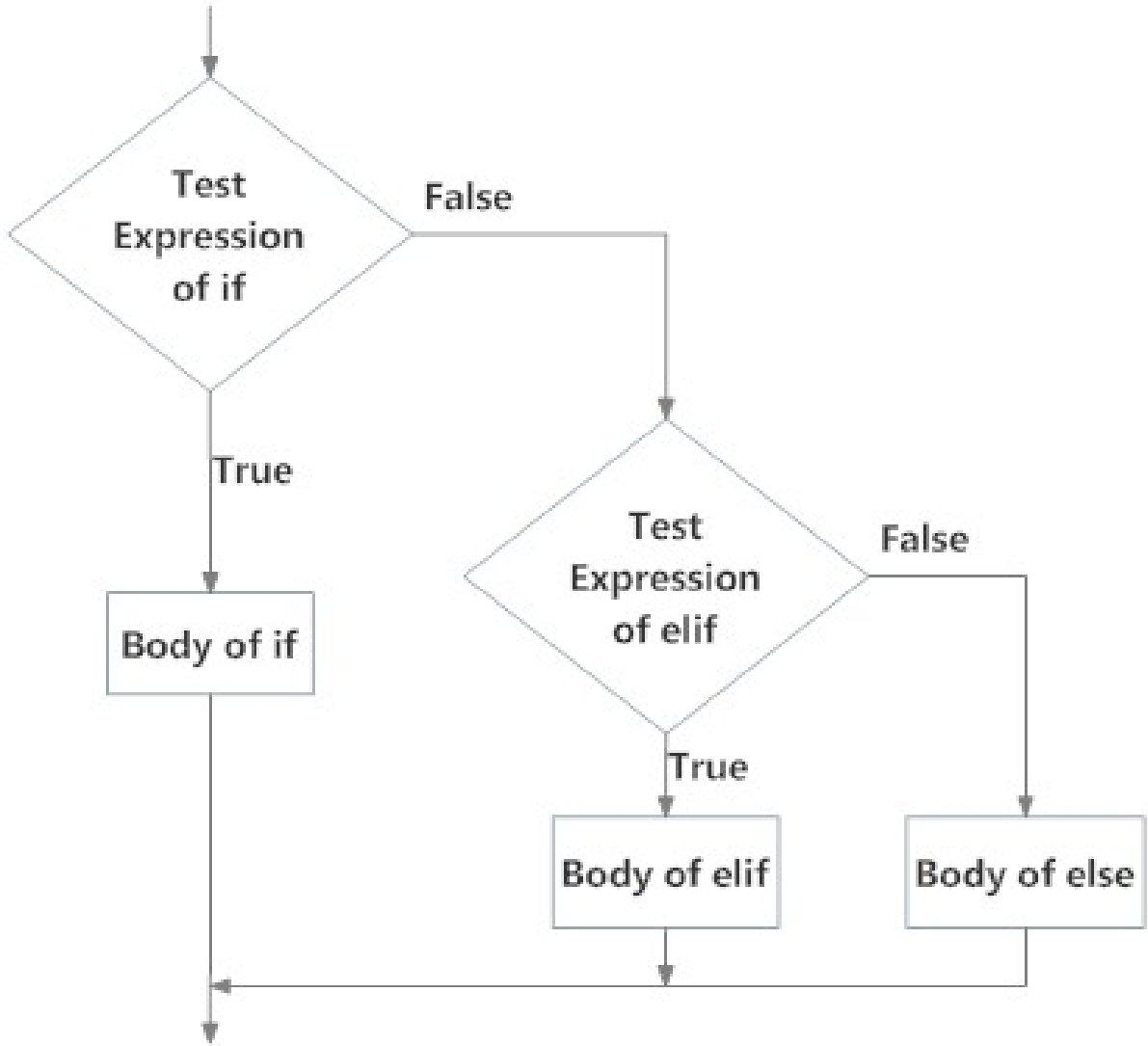
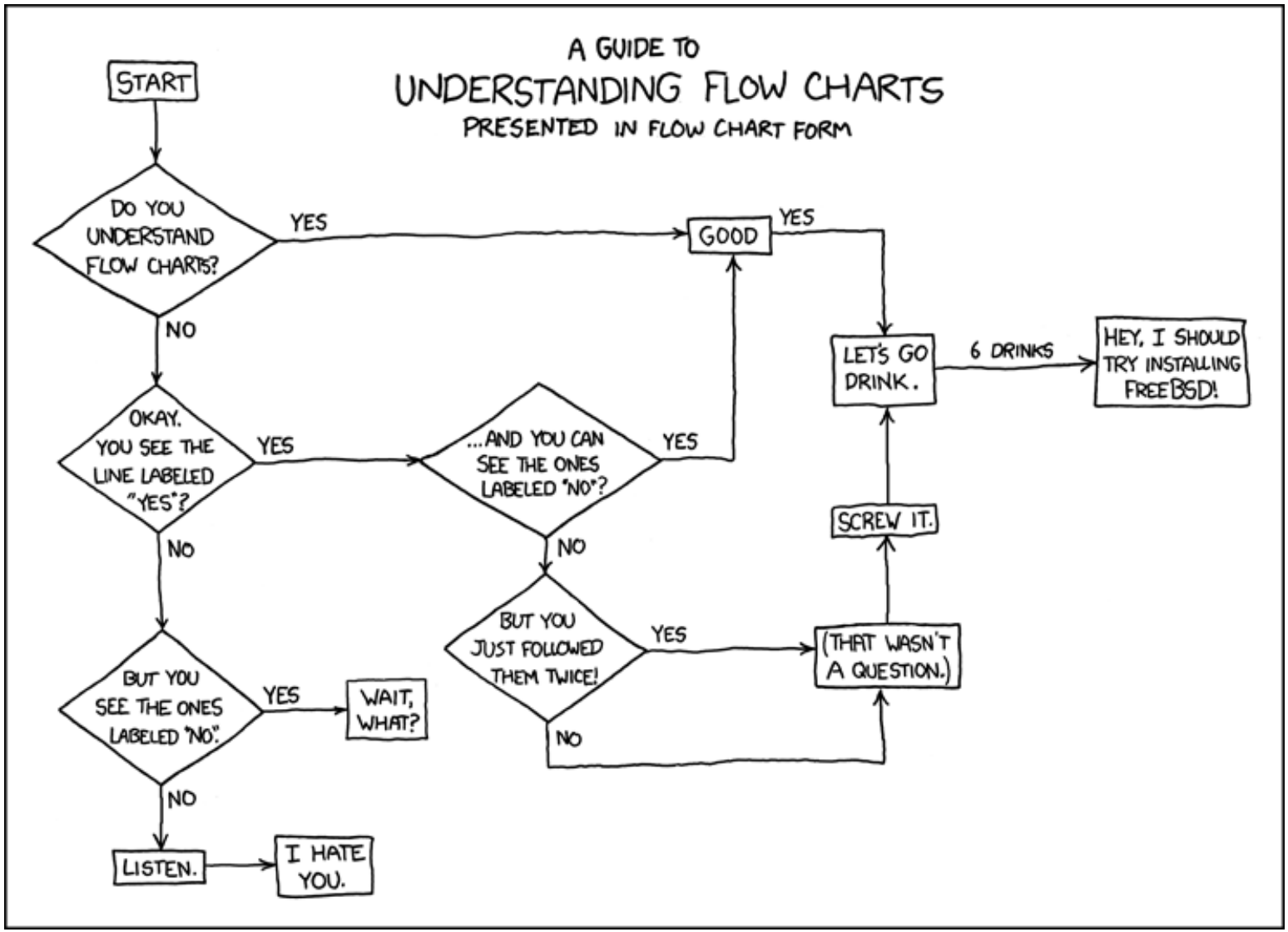


Fig: Operation of if...elif...else statement

(programiz)

Side Note: Reading Flow Charts



(xkcd/518)

Today's Topics

- Recap: Decisions
- **Logical Expressions**
- Circuits
- Binary Numbers
- CS Survey

In Pairs or Triples

Predict what the code will do:

```
origin = "Indian Ocean"
winds = 100
if (winds > 74):
    print("Major storm, called a ", end="")
    if origin == "Indian Ocean" or origin == "South Pacific":
        print("cyclone.")
    elif origin == "North Pacific":
        print("typhoon.")
    else:
        print("hurricane.")

visibility = 0.2
winds = 40
conditions = "blowing snow"
if (winds > 35) and (visibility < 0.25) and \
      (conditions == "blowing snow" or conditions == "heavy snow"):
    print("Blizzard!")
```

Python Tutor

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(Demo with `pythonTutor`)

Logical Operators

and

in1		in2	*returns:*
`False`	`and`	`False`	`False`
`False`	`and`	`True`	`False`
`True`	`and`	`False`	`False`
`True`	`and`	`True`	`True`

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`False`	`and`	`False`	`False`
`False`	`and`	`True`	`False`
`True`	`and`	`False`	`False`
`True`	`and`	`True`	`True`

or

in1		in2	*returns:*
`False`	`or`	`False`	`False`
`False`	`or`	`True`	`True`
`True`	`or`	`False`	`True`
`True`	`or`	`True`	`True`

Logical Operators

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or

in1		in2	*returns:*
`False`	`or`	`False`	`False`
`False`	`or`	`True`	`True`
`True`	`or`	`False`	`True`
`True`	`or`	`True`	`True`

not

	in1	*returns:*
`not`	`False`	`True`
`not`	`True`	`False`

In Pairs or Triples

Predict what the code will do:

```
semHours = 18
reqHours = 120
if semHours >= 12:
    print('Full Time')
else:
    print('Part Time')

pace = reqHours // semHours
if reqHours % semHours != 0:
    pace = pace + 1
print('At this pace, you will graduate in', pace, 'semesters,')
yrs = pace / 2
print('(or', yrs, 'years).')


for i in range(1,20):
    if (i > 10) and (i % 2 == 1):
        print('oddly large')
    else:
        print(i)
```

Python Tutor

```
semHours = 18
reqHours = 120
if semHours >= 12:
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- Recap: Decisions
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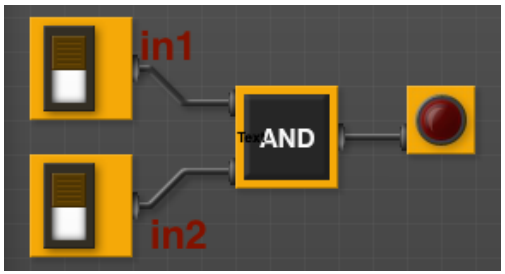
- **Circuits**
- CS Survey

Circuit Demo

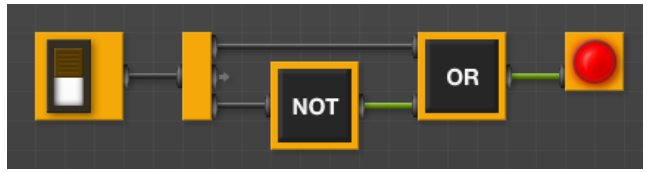


(Demo with `neuroproductions`)

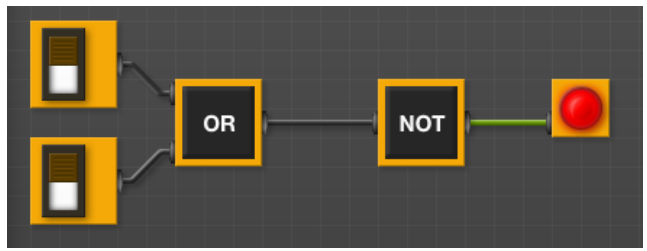
In Pairs or Triples

Predict when these expressions are true:

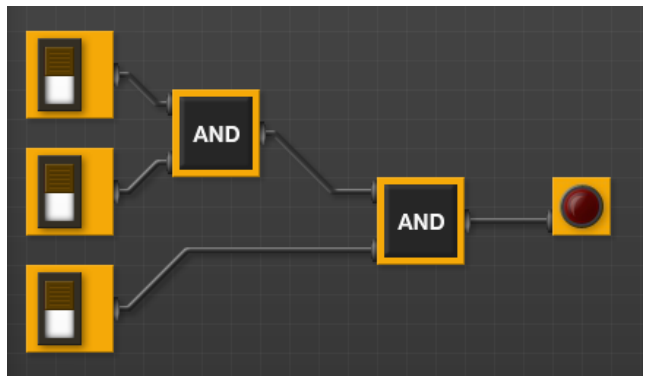
- `in1 or not in1`:



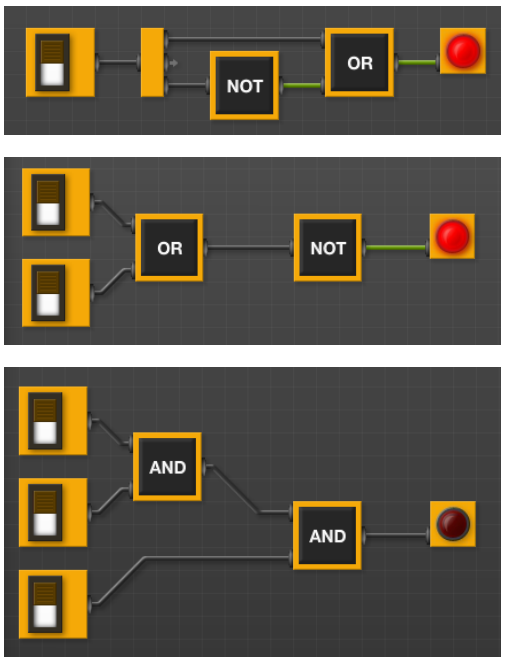
- `not(in1 or in2)`:



- `(in1 and in2) and in3`:



Circuit Demo



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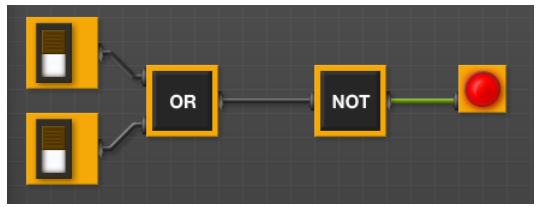
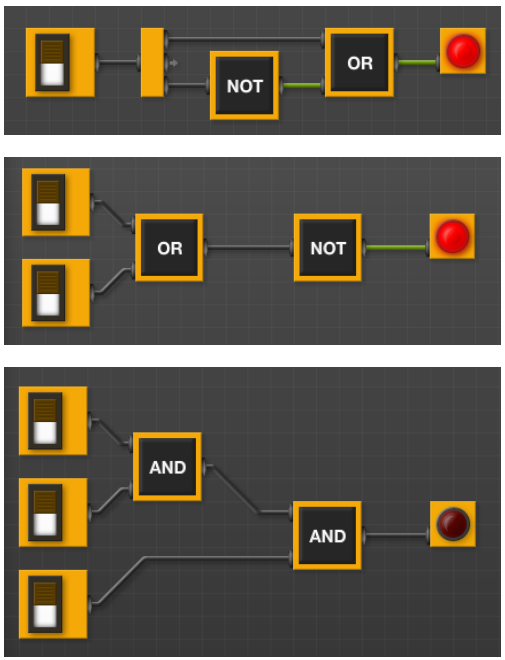
In Pairs or Triples



Draw a circuit that corresponds to each logical expression:

- `in1 or in2`
- `(in1 or in2) and (in1 or in3)`
- `(not(in1 and not in2)) or (in1 and (in2 and in3))`

Circuit Demo



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- Recap: Decisions
- Logical Expressions
- Circuits
- **Binary Numbers**
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Binary Numbers

- Logic $\rightarrow$ Circuits $\rightarrow$ Numbers

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- Digital logic design allows for two states:

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Binary Numbers

- Logic $\rightarrow$ Circuits $\rightarrow$ Numbers
- Digital logic design allows for two states:
  - True / False
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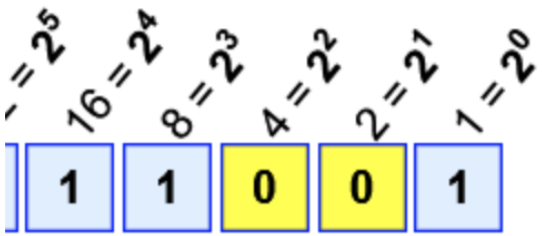
  - 1 / 0
- Computers store numbers using the Binary system (base 2)
- A **bit** (binary digit) being 1 (on) or 0 (off)

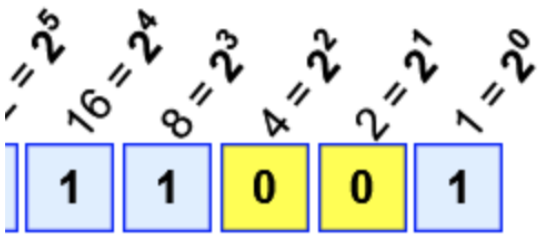
Binary Numbers



Example: 1×16 + 1×8 + 1×1 = 16+8+1 = 25

- Two digits: **0** and **1**

Binary Numbers



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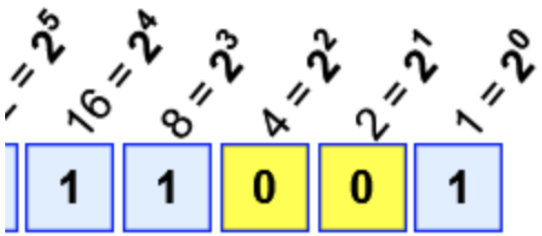

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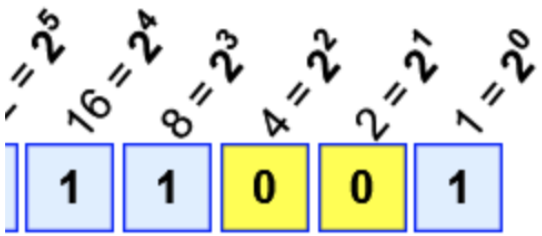

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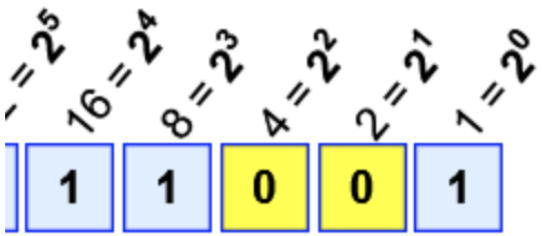

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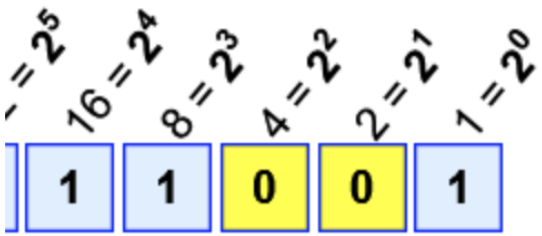

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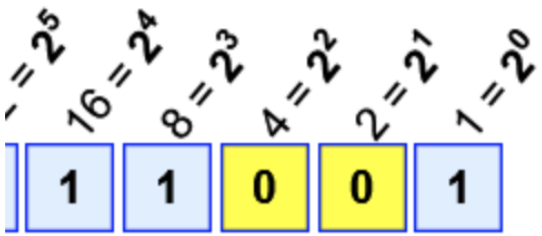
  - In the "ones" position we either have a 1 or not

Binary Numbers



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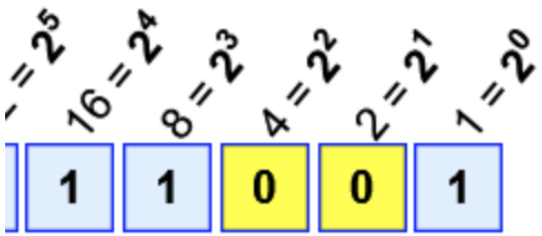
Binary Numbers



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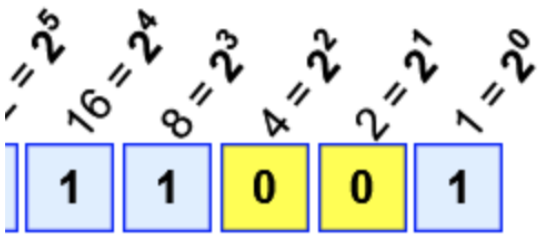
  - In the "fours" position we either have a 4 or not ...

Binary Numbers



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  - In the "fours" position we either have a 4 or not ...
- **Example:**

$$11001_{base2} = 16 + 8 + 1 = 25_{base10}$$

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- **CS Survey**

CS Survey Talk: CUNY2X & TTP @Hunter

Bernard Desert & Elise Harris

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- Brief overview of CUNY 2X & Tech Talent Pipeline

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Bernard Desert & Elise Harris

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Bernard Desert & Elise Harris

- Brief overview of CUNY 2X & Tech Talent Pipeline
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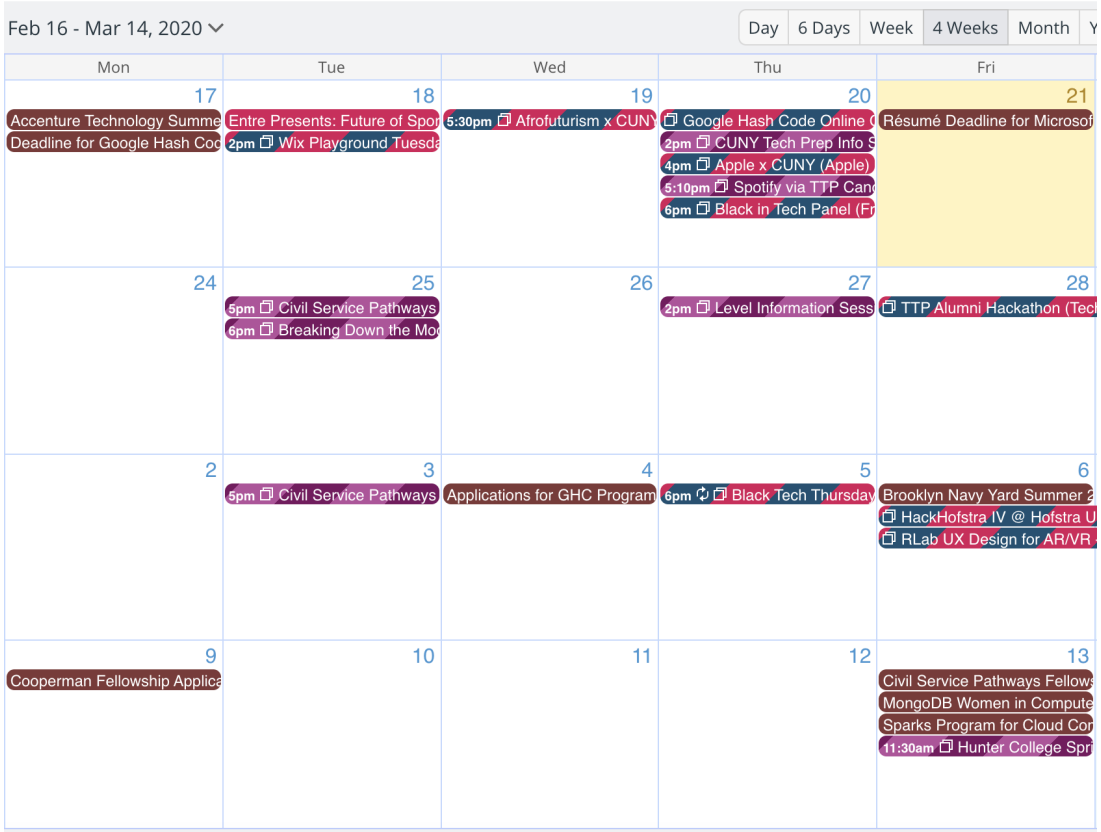
- Design challenge: classic tech interview question.

CS Survey Talk: Hunter Tech Calendar



Sign up:

- Tech events calendar: `http://bit.ly/HunterTechCalendar`
- Newsletter: `http://bit.ly/CUNY2XNewsletter`
- Hunter CS Handbook: `http://bit.ly/huntercshandbook`

Tech Interview Classic

- Write a program that prints the numbers from 1 to 100. But for multiples of three print “Fizz” instead of the number and for the multiples of five print “Buzz”. For numbers which are multiples of both three and five print “FizzBuzz”.

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  1

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  1
  2

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  1
  2
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  ...
  14

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- To Do List:

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  - If divisible by both, print “FizzBuzz”.
  - **Otherwise print the number.**

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  - If divisible by both, print “FizzBuzz”.
  - **Otherwise print the number.**
    We should do this one first!

Tech Interview Classic

- Write a program that prints the numbers from 1 to 100. But for multiples of three print “Fizz” instead of the number and for the multiples of five print “Buzz”. For numbers which are multiples of both three and five print “FizzBuzz”.
- To Do List (**Reordered**):

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- To Do List (**Reordered**):
  - Create a loop that goes from 1 to 100.
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```
for i in range(1,101):
```

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  - Create a loop that goes from 1 to 100.
  - Print the numbers not divisible by 3 or 5.
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  - Also should print a new line (so each entry is on its own line).
- One solution (uses `print(,end="")` that prints all on the same line):

```
for i in range(1,101):
    if i%3 != 0 and i%5 != 0:
```

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for i in range(1,101):
    if i%3 != 0 and i%5 != 0:
        print(i, end="")
    if i%3 == 0:
```

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    if i%3 == 0:
        print("Fizz", end="")
```

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for i in range(1,101):
    if i%3 != 0 and i%5 != 0:
        print(i, end="")
    if i%3 == 0:
        print("Fizz", end="")
    if i%5 == 0:
        print("Buzz", end="")
    print()
```

Recap

- On lecture slip, write down a topic you wish we had spent more time (and why).

Recap

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- In Python, we introduced:

Recap

- On lecture slip, write down a topic you wish we had spent more time (and why).
- In Python, we introduced:
  - Decisions
  - Logical Expressions
  - Circuits
  - Binary Numbers

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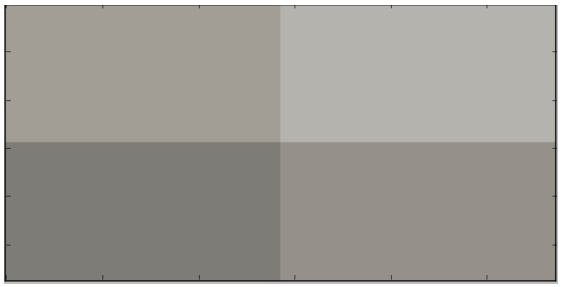
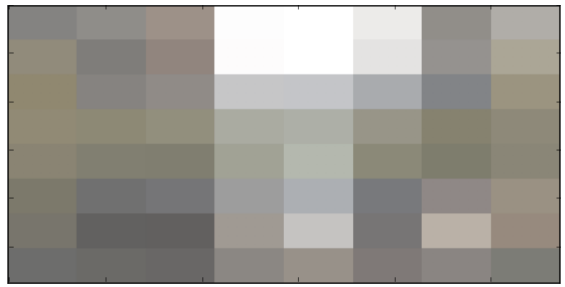
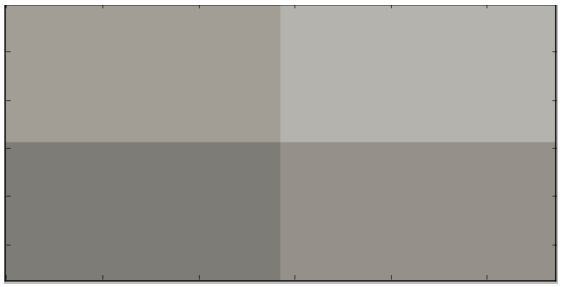
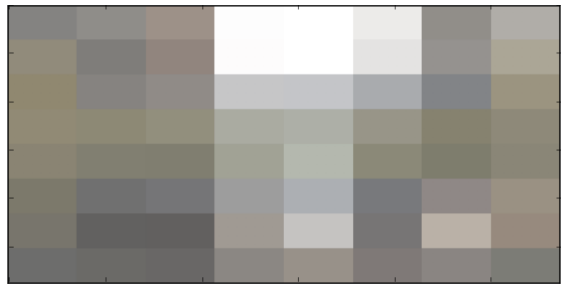
- On lecture slip, write down a topic you wish we had spent more time (and why).
- In Python, we introduced:
  - Decisions
  - Logical Expressions
  - Circuits
  - Binary Numbers
- Pass your lecture slips to the aisles for the UTAs to collect.

Practice Quiz & Final Questions

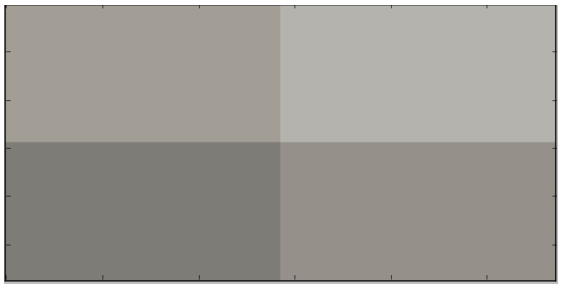
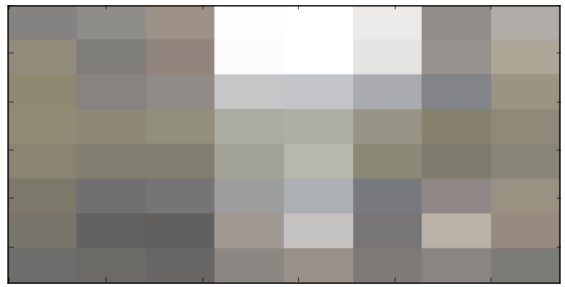

- Since you must pass the final exam to pass the course, we end every lecture with final exam review.

Practice Quiz & Final Questions


- Since you must pass the final exam to pass the course, we end every lecture with final exam review.
- Pull out something to write on (not to be turned in).

Practice Quiz & Final Questions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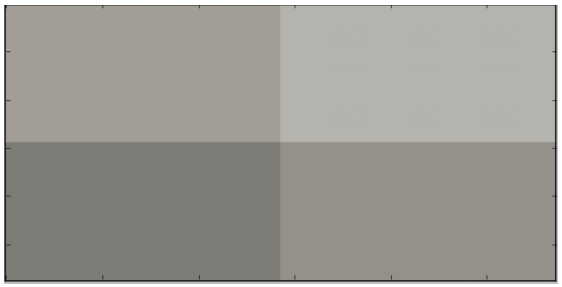
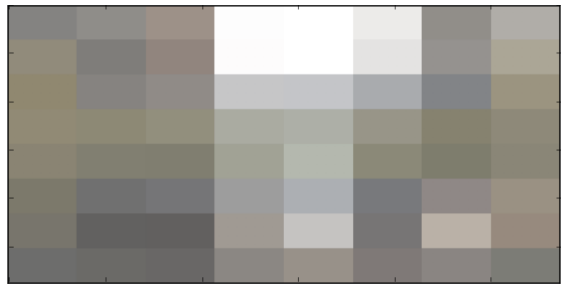
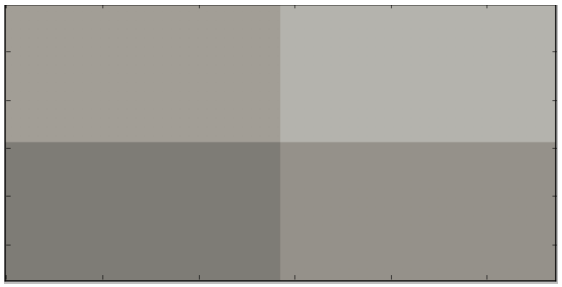
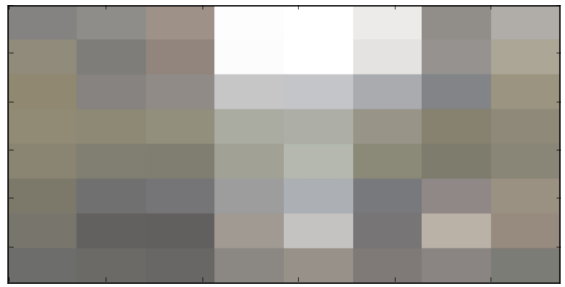
Practice Quiz & Final Questions


- Since you must pass the final exam to pass the course, we end every lecture with final exam review.
- Pull out something to write on (not to be turned in).
- Lightning rounds:
  - write as much you can for 60 seconds;

Practice Quiz & Final Questions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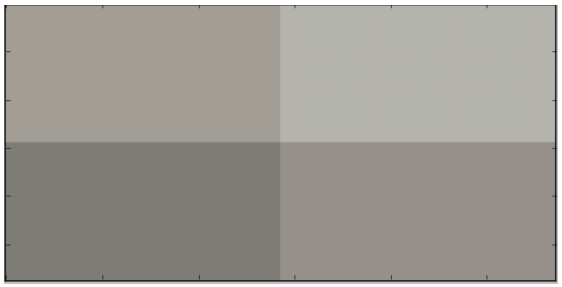
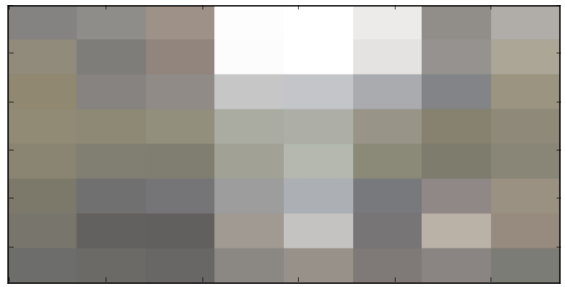
Practice Quiz & Final Questions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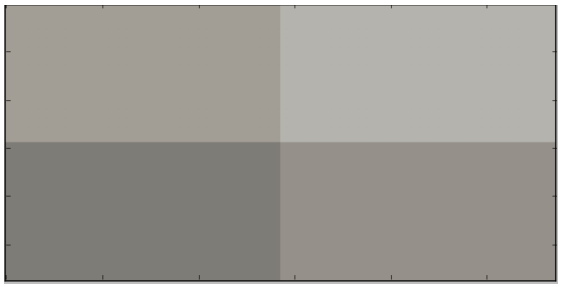
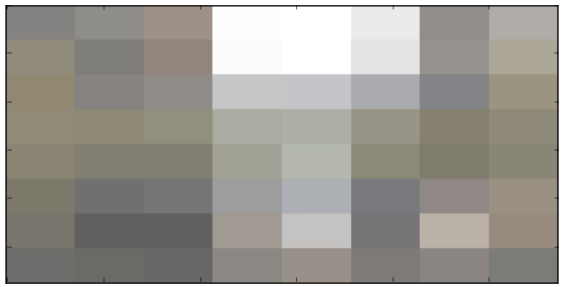
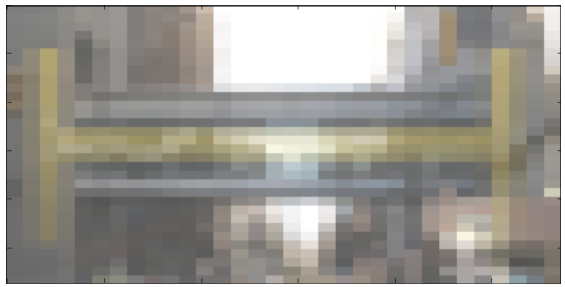
Practice Quiz & Final Questions

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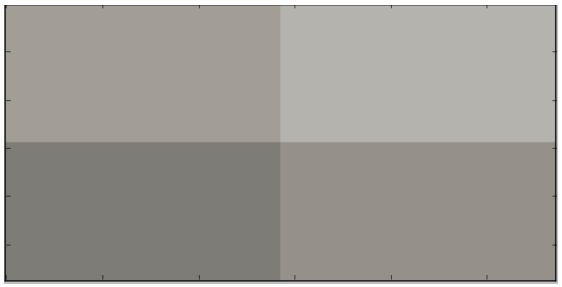
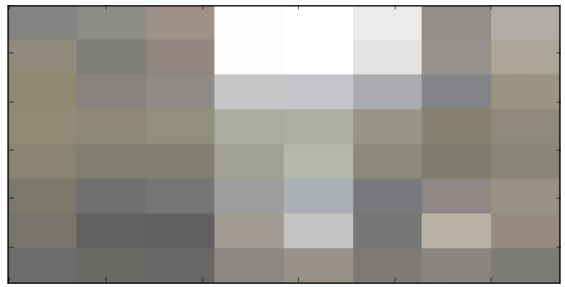
- Past exams are on the webpage (under Final Exam Information).

Practice Quiz & Final Questions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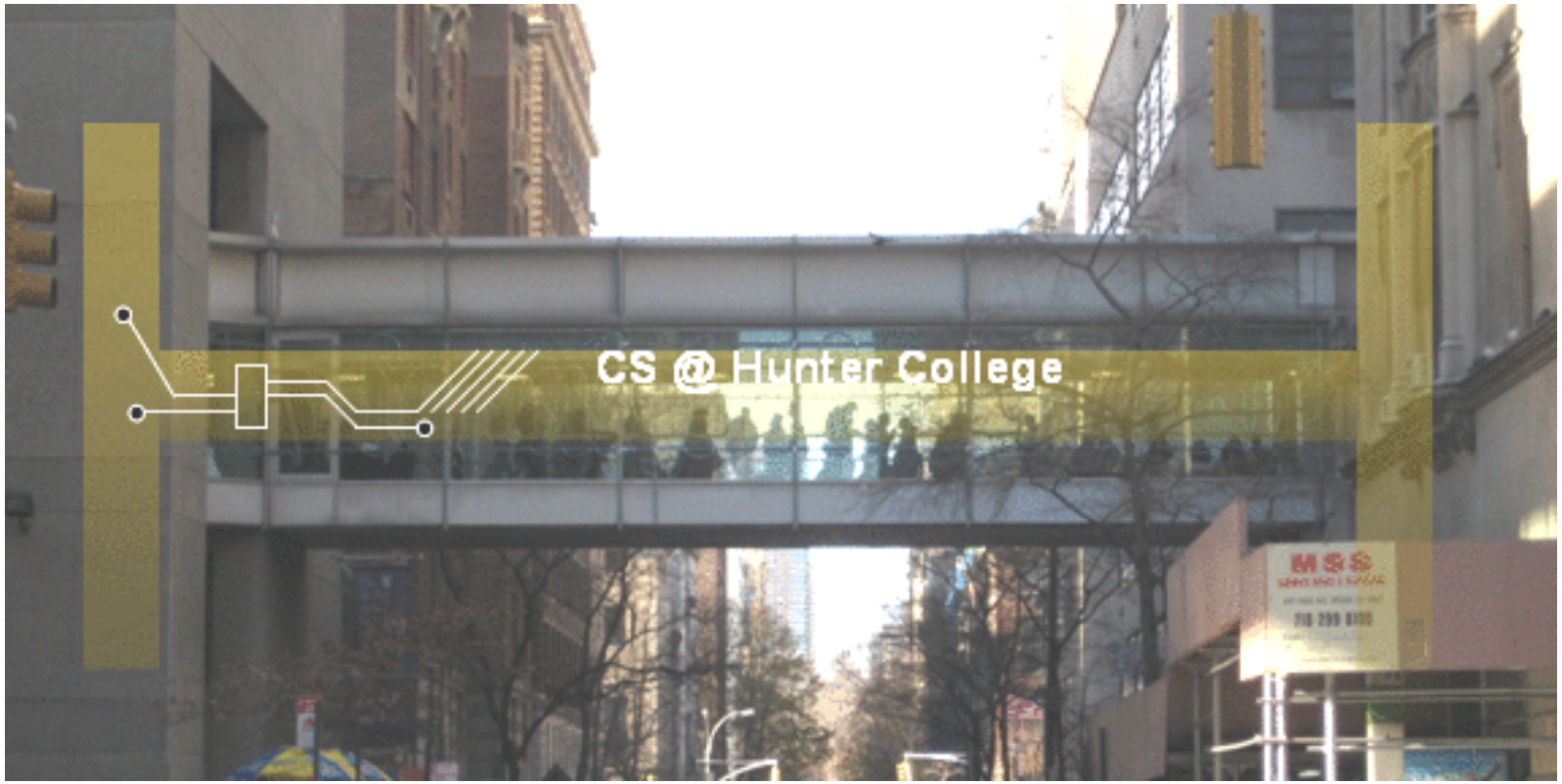
- We're starting with Spring 2018, Version 1.

Writing Boards



- Return writing boards as you leave...