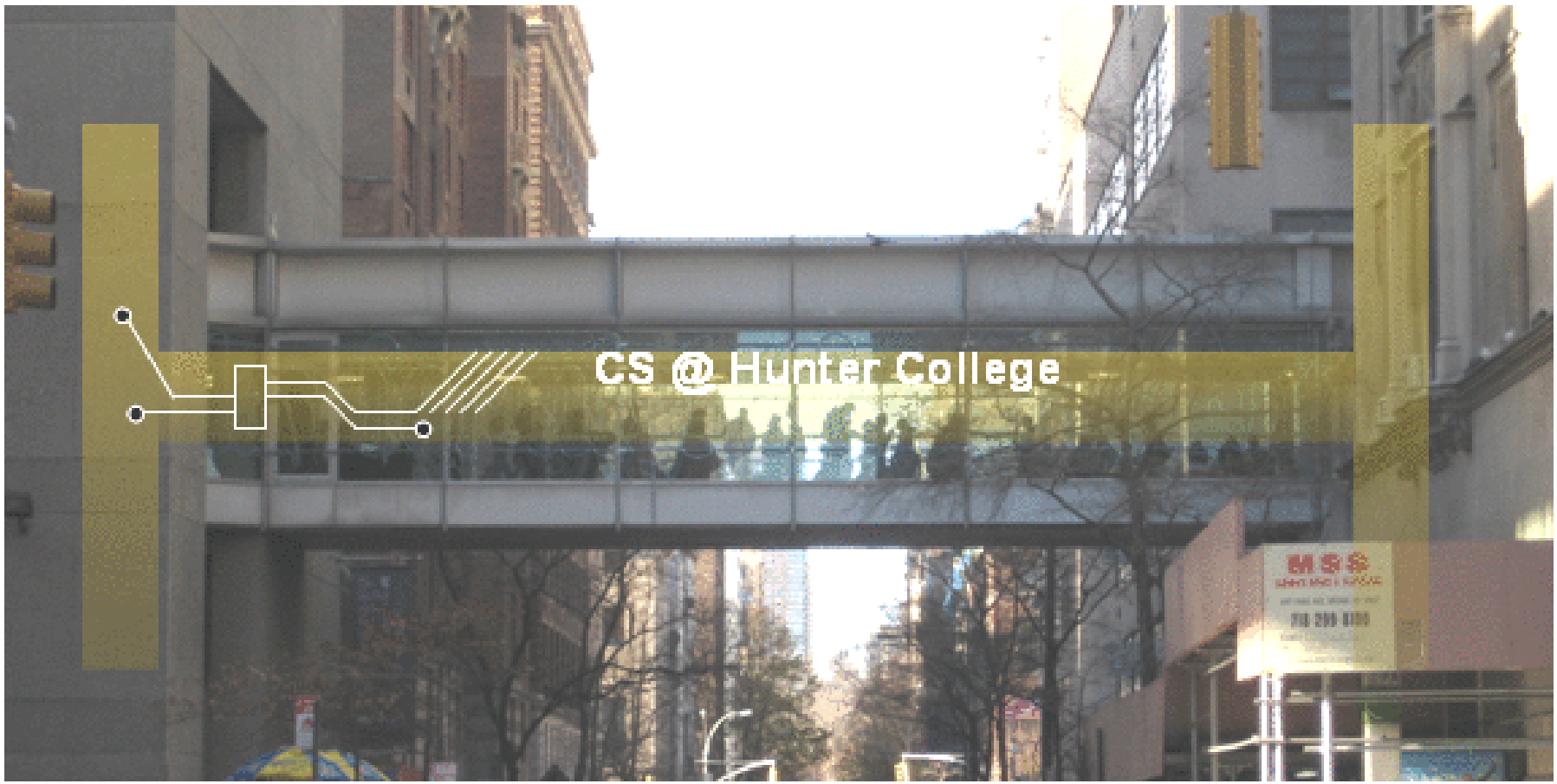
CSci 127: Introduction to Computer Science



hunter.cuny.edu/csci

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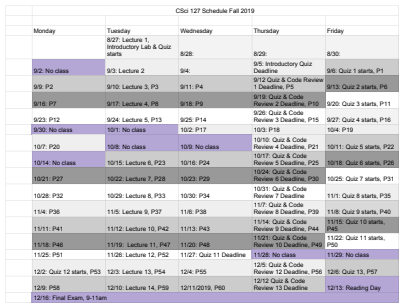

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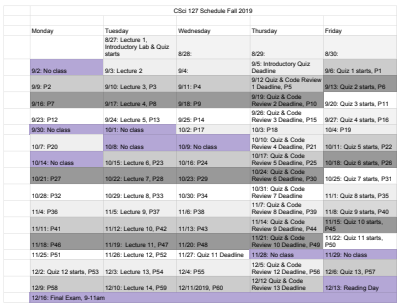

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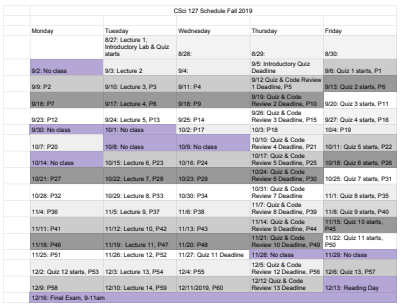

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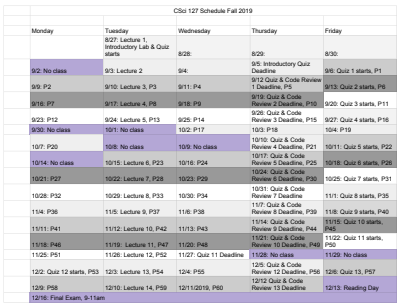

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- CS Survey:

  Today: Bernard Desert & Elise Harris, CUNY 2X & Tech Talent Pipeline

Frequently Asked Questions

From lecture slips & recitation sections.

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Today's Topics

- Recap: Indexing, Slicing, & Decisions
- Logical Expressions
- Circuits
- CS Survey

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Recap: Linguistics Challenge

Linguistic experts!

Design a program that counts the number of plural nouns in a list of nouns. Think about:

- what the input is,
- what the output is, and
- how you can determine if a noun is plural.

Note: To simplify the problem, assume all plural nouns end in \s".

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nouns = "hats coats glasses scarves"
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print(nouns.count('s '))
```

Recap: Linguistics Challenge

```
nouns = "hats coats glasses scarves"
```

When a word end with an 's'?

- Have the pattern: 's '
- To count plural words:

```
print(nouns.count('s '))
```

Linguistic experts!

Recap: Linguistics Challenge

Linguistic experts!

```
nouns = "hats coats glasses scarves"
```

When a word end with an 's'?

- Have the pattern: 's '
- To count plural words:

```
print(nouns.count('s '))
```

- Not quite right{ missing `scarves` since no space at the end.

Recap: Linguistics Challenge


Linguistic experts!

```
nouns = "hats coats glasses scarves"
```

When a word end with an 's'?

- Have the pattern: 's '
- To count plural words:

```
print(nouns.count('s '))
```

- Not quite right{ missing `scarves` since no space at the end.
- To x this, let's add a space, then count:

```
nouns = nouns + " "
print(nouns.count('s '))
```

Lecture Slip: In Pairs or Triples...

Fill in the following on your lecture slip:

1.
```
motto = "Mihi cura futuri"
print(motto[2:4])
print(motto[2:4].upper())
```

2.
```
ER = "The future belongs to those who believe in the beauty of their dreams."
print(ER.upper()[2], ER[13], ER[2], "a", ER[15], ER[14], "r  R.")
```

Recap: Indexing & Slicing

```
motto = "Mihi cura futuri"
print(motto[2:4])
print(motto[2:4].upper())
```

Recap: Indexing & Slicing

```
motto = "Mihi cura futuri"
print(motto[2:4])
print(motto[2:4].upper())
```

M	i	h	i		c	u	r	a		f	u	t	u	r	i

Recap: Indexing & Slicing

```
motto = "Mihi cura futuri"
print(motto[2:4])
print(motto[2:4].upper())
```

M	i	h	i		c	u	r	a		f	u	t	u	r	i
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Recap: Indexing & Slicing

```
motto = "Mihi cura futuri"
print(motto[2:4])
print(motto[2:4].upper())
```

M	i	**h**	**i**		c	u	r	a		f	u	t	u	r	i
0	1	**2**	**3**	4	5	6	7	8	9	10	11	12	13	14	15

Recap: Indexing & Slicing

```
motto = "Mihi cura futuri"
print(motto[2:4])
print(motto[2:4].upper())
```

M	i	**h**	**i**		c	u	r	a		f	u	t	u	r	i
0	1	**2**	**3**	4	5	6	7	8	9	10	11	12	13	14	15

Output:

```
hi
```

Recap: Indexing & Slicing

```
motto = "Mihi cura futuri"
print(motto[2:4])
print(motto[2:4].upper())
```

M	i	**h**	**i**		c	u	r	a		f	u	t	u	r	i
0	1	**2**	**3**	4	5	6	7	8	9	10	11	12	13	14	15

Output:

```
hi
HI
```

Recap: Indexing & Slicing

```
ER = "The future belongs to those who believe in the beauty of their dreams."
print(ER.upper()[2], ER[13], ER[2], "a", ER[15], ER[14], "r  R.")
```

Recap: Indexing & Slicing

```
ER = "The future belongs to those who believe in the beauty of their dreams."
print(ER.upper()[2], ER[13], ER[2], "a", ER[15], ER[14], "r  R.")
```

T	h	e		f	u	t	u	r	e		b	e	l	o	n	g	s
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Recap: Indexing & Slicing

```
ER = "The future belongs to those who believe in the beauty of their dreams."
print(ER.upper()[2], ER[13], ER[2], "a", ER[15], ER[14], "r  R.")
```

T	h	**e**		f	u	t	u	r	e		b	e	l	o	n	g	s
0	1	**2**	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

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```

T	h	**e**		f	u	t	u	r	e		b	e	**l**	o	n	g	s
0	1	**2**	3	4	5	6	7	8	9	10	11	12	**13**	14	15	16	17

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```

T	h	**e**		f	u	t	u	r	e		b	e	**l**	o	**n**	g	s
0	1	**2**	3	4	5	6	7	8	9	10	11	12	**13**	14	**15**	16	17

Recap: Indexing & Slicing

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print(ER.upper()[2], ER[13], ER[2], "a", ER[15], ER[14], "r  R.")
```

T	h	**e**		f	u	t	u	r	e		b	e	**l**	**o**	**n**	g	s
0	1	**2**	3	4	5	6	7	8	9	10	11	12	**13**	**14**	**15**	16	17

Recap: Indexing & Slicing

```
ER = "The future belongs to those who believe in the beauty of their dreams."
print(ER.upper()[2], ER[13], ER[2], "a", ER[15], ER[14], "r  R.")
```

T	h	**e**		f	u	t	u	r	e		b	e	**l**	**o**	**n**	g	s
0	1	**2**	3	4	5	6	7	8	9	10	11	12	**13**	**14**	**15**	16	17

Output:

Recap: Indexing & Slicing

```
ER = "The future belongs to those who believe in the beauty of their dreams."
print(ER.upper()[2], ER[13], ER[2], "a", ER[15], ER[14], "r  R.")
```

T	h	**e**		f	u	t	u	r	e		b	e	**l**	**o**	**n**	g	s
0	1	**2**	3	4	5	6	7	8	9	10	11	12	**13**	**14**	**15**	16	17

Output:

E l e a n o r R.

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")
```

Python Tutor

```
#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)
```

(Demo with pythonTutor)

Decisions

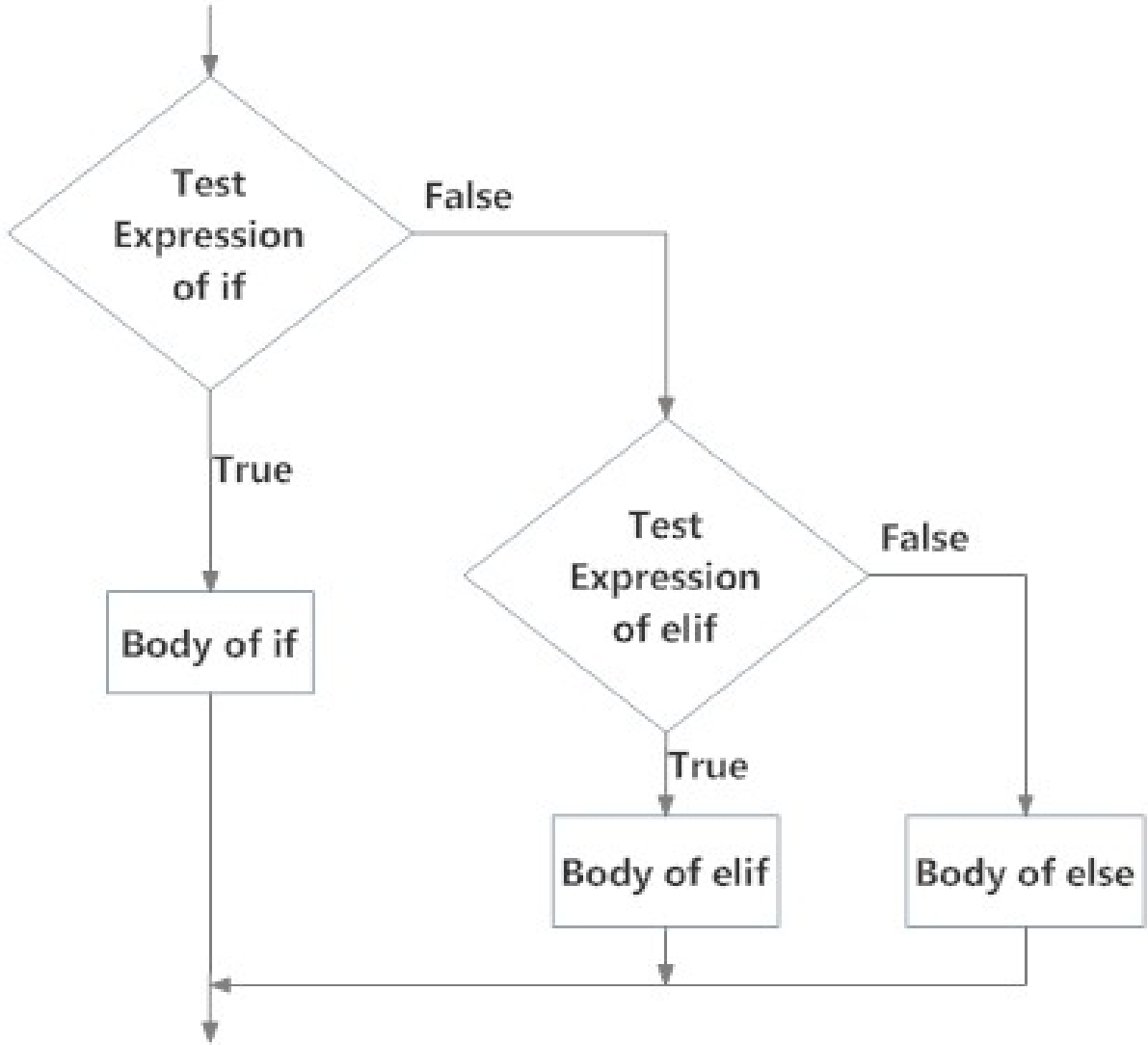
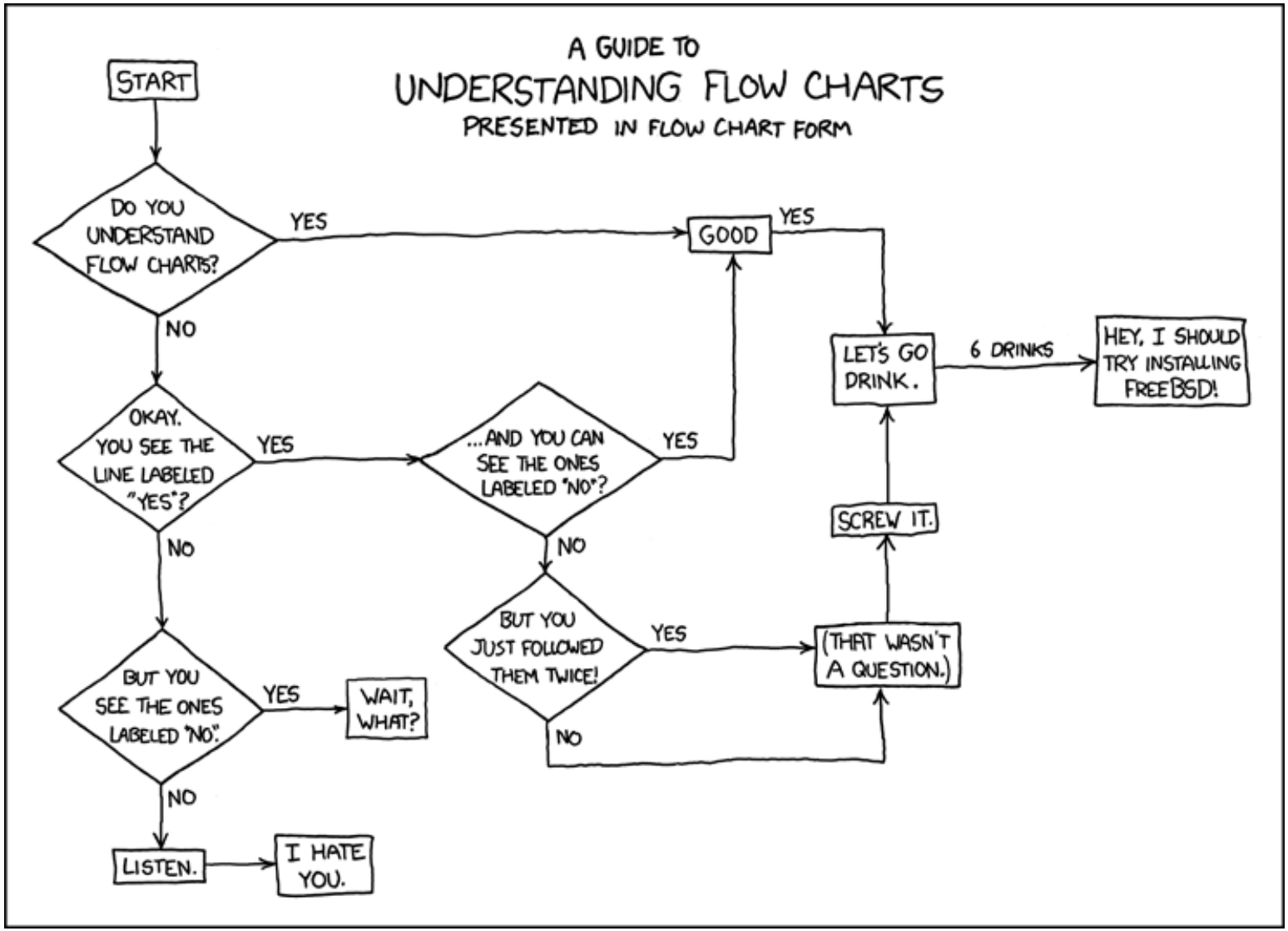


Fig: Operation of if...elif...else statement

(programiz)

Side Note: Reading Flow Charts



(xkcd/518)

Today's Topics

- Recap: Indexing, Slicing, & Decisions
- **Logical Expressions**
- Circuits
- 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

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

(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`

Logical Operators

and

in1		in2	*returns:*
`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

and

in1		in2	*returns:*
`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`

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:
     print('Full Time')
else:
     print('Part Time')

pace = reqHours // semHours
if reqHours % semHours != 0:
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yrs = pace / 2
print('(or', yrs, 'years).')

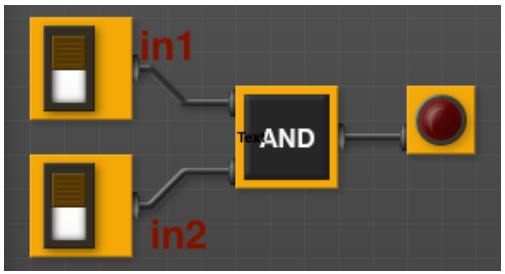

for i in range(1,20):
     if (i > 10) and (i % 2 == 1):
          print('oddly large')
     else:
          print(i)
```

(Demo with pythonTutor)

Today's Topics

- Recap: Indexing, Slicing, & Decisions
- Logical Expressions
- **Circuits**
- CS Survey

Circuit Demo

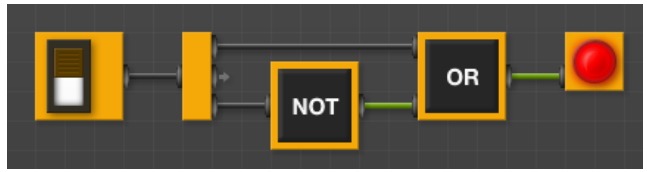


(Demo with `neuroproductions`)

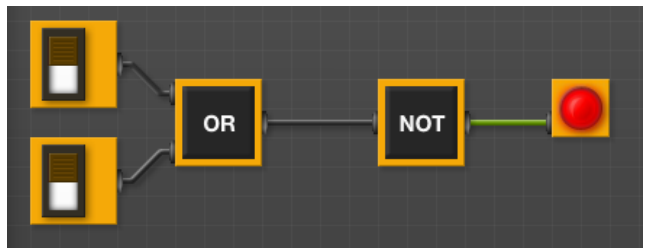
In Pairs or Triples

Predict when these expressions are true:

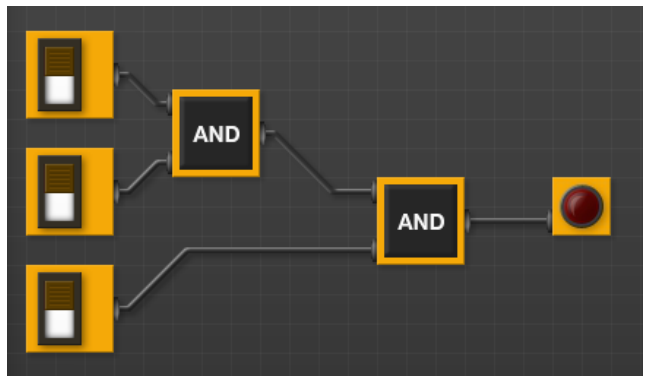
- `in1 or not in1`:



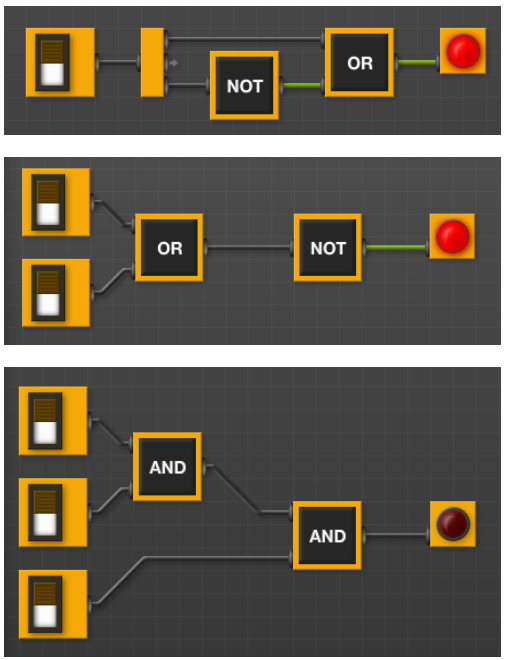
- `not(in1 or in2)`:



- `(in1 and in2) and in3`:

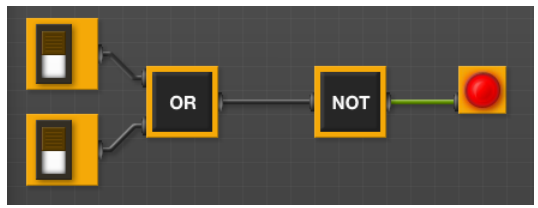


Circuit Demo



(Demo with `neuroproductions`)

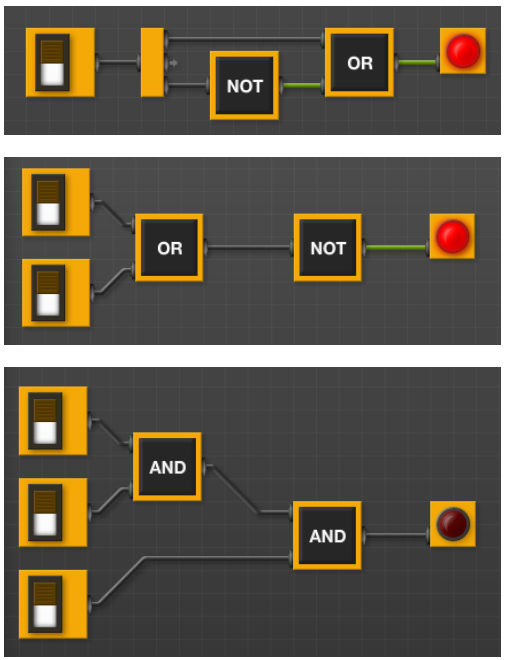
In Pairs or Triples



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



(Demo with `neuroproductions`)

Today's Topics

- Recap: Indexing, Slicing, & Decisions
- Logical Expressions
- Circuits
- **CS Survey**

CS Survey Talk: CUNY2X & TTP @Hunter

Bernard Desert & Elise Harris

CS Survey Talk: CUNY2X & TTP @Hunter

Bernard Desert & Elise Harris

Brief overview of CUNY 2X & Tech Talent Pipeline

CS Survey Talk: CUNY2X & TTP @Hunter

Bernard Desert & Elise Harris

- Brief overview of CUNY 2X & Tech Talent Pipeline
- What Bernard & Elise love about their jobs.

CS Survey Talk: CUNY2X & TTP @Hunter

Bernard Desert & Elise Harris

- Brief overview of CUNY 2X & Tech Talent Pipeline
- What Bernard & Elise love about their jobs.
- Design challenge: classic tech interview question.

CS Survey Talk: Hunter Tech Calendar

To sign up:

http://bit.ly/cuny2xcontactinfo

Does not have to be a Hunter email{ prefer one that you access mo

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

Tech Interview Classic

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Write down the output to see the pattern:

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

Write down the output to see the pattern:
1

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

Write down the output to see the pattern:
1
2

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

Write down the output to see the pattern:
1
2
Fizz

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

Write down the output to see the pattern:

1
2
Fizz
4

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

Write down the output to see the pattern:

1
2
Fizz
4
Buzz

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

Write down the output to see the pattern:

1
2
Fizz
4
Buzz
5

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

Write down the output to see the pattern:

1
2
Fizz
4
Buzz
5
Fizz

Tech Interview Classic

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Write down the output to see the pattern:

1
2
Fizz
4
Buzz
5
Fizz
7

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

Write down the output to see the pattern:

1
2
Fizz
4
Buzz
5
Fizz
7
...
14

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

Write down the output to see the pattern:

1
2
Fizz
4
Buzz
5
Fizz
7
...
14
FizzBuzz

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

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To Do List:

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

To Do List:

- Create a loop that goes from 1 to 100.

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

To Do List:

- Create a loop that goes from 1 to 100.
- If the number is divisible by 3, print \Fizz".

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

To Do List:

- Create a loop that goes from 1 to 100.
- If the number is divisible by 3, print \Fizz".
- If the number is divisible by 5, print \Buzz".

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

To Do List:

- Create a loop that goes from 1 to 100.
- If the number is divisible by 3, print \Fizz".
- If the number is divisible by 5, print \Buzz".
- If divisible by both, print \FizzBuzz".

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

To Do List:

- Create a loop that goes from 1 to 100.
- If the number is divisible by 3, print \Fizz".
- If the number is divisible by 5, print \Buzz".
- If divisible by both, print \FizzBuzz".
- Otherwise print the number.

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

To Do List:

- Create a loop that goes from 1 to 100.
- If the number is divisible by 3, print \Fizz".
- If the number is divisible by 5, print \Buzz".
- If divisible by both, print \FizzBuzz".
- Otherwise print the number.
  We should do this one rst!

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

To Do List (Reordered):

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

To Do List (Reordered):

- Create a loop that goes from 1 to 100.
- Print the numbers not divisible by 3 or 5.
- If the number is divisible by 3, print \Fizz".
- If the number is divisible by 5, print \Buzz".
- If divisible by both, print \FizzBuzz".

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 ve print \Buzz". For numbers which are multiples of both three and ve print \FizzBuzz".

To Do List (Reordered):

- Create a loop that goes from 1 to 100.
- Print the numbers not divisible by 3 or 5.
- If the number is divisible by 3, print \Fizz".
- If the number is divisible by 5, print \Buzz".
- If divisible by both, print \FizzBuzz".
- Also should print a new line (so each entry is on its own line).

Tech Interview Classic

To Do List:

- Create a loop that goes from 1 to 100.
- Print the numbers not divisible by 3 or 5.
- If the number is divisible by 3, print \Fizz".
- If the number is divisible by 5, print \Buzz".
- If divisible by both, print \FizzBuzz".
- Also should print a new line (so each entry is on its own line).

Tech Interview Classic

To Do List:

- Create a loop that goes from 1 to 100.
- Print the numbers not divisible by 3 or 5.
- If the number is divisible by 3, print \Fizz".
- If the number is divisible by 5, print \Buzz".
- If divisible by both, print \FizzBuzz".
- 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):

Tech Interview Classic

To Do List:

- Create a loop that goes from 1 to 100.
- Print the numbers not divisible by 3 or 5.
- If the number is divisible by 3, print \Fizz".
- If the number is divisible by 5, print \Buzz".
- If divisible by both, print \FizzBuzz".
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for i in range(1,101):
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```
for i in range(1,101):
    if i%3 != 0 and i%5 != 0:
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for i in range(1,101):
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        print(i, end="")
    if i%3 == 0:
```

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        print("Fizz", end="")
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One solution (uses print(,end="") that prints all on the same line):

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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).

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We're starting with Spring 2018, Version 1.

Writing Boards

Return writing boards as you leave...