

CSci 127: Introduction to Computer Science



hunter.cuny.edu/csci

Welcome



- Prof. Sakas, Department Chair and Course Coordinator

Introductions: Course Coordinators



Dr. Katherine St. John

Instructor



Dr. William Sakas

Chair

Introductions: Recitation Instructors



Basak Taylan



Ekaterina Kistanova



Gwenael Gatto



Jiaxing Tan



Katherine Howitt



Minh Nguyen



Subhadarshi Panda



Xiaojie Zhang



Xiaoke (Jimmy) Shen

Introductions: Undergraduate Teaching Assistants



Antonio Bountouvas



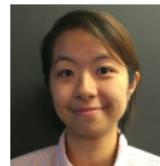
Alvin Lam



Brian Campbell



Calvin Quach



Carol Chau



Dandan Lin



Jaime Canizales



Jack Chen



Jakub Taraska



Jesse Goodspeed



Karen Medlin



Karoline Dubin



Lily Caplan



Munem Rastgir



Nicky Cen



Olga Kent



Qiuqun Wang



Savannah Nester



Silvena Chan



Usmaan Sahak



Vincent Zheng



Yasmeen Hassan

Syllabus

CSci 127: Introduction to Computer Science

Catalog Description: 3 hours, 3 credits: This course presents an overview of computer science (CS) with an emphasis on problem-solving and computational thinking through 'coding': computer programming for beginners. Other topics include: organization of hardware, software, and how information is structured on contemporary computing devices. This course is pre-requisite to several introductory core courses in the CS Major. The course is also required for the CS minor. MATH 12500 or higher is strongly recommended as a co-req for intended Majors.

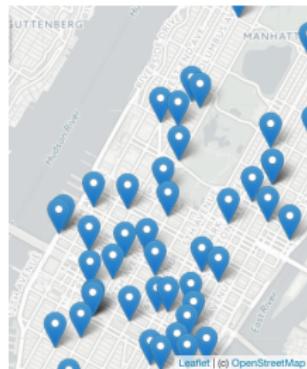
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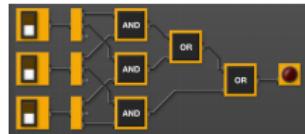
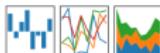
(Show syllabus webpage)

Syllabus: Topics

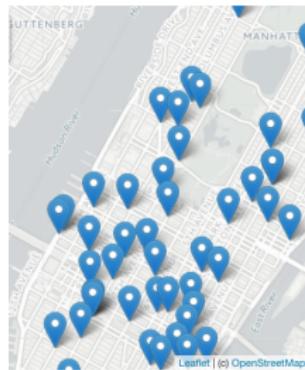


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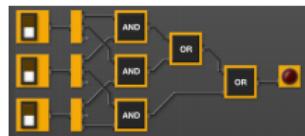
pandas
 $y_{it} = \beta' x_{it} + \mu_i + \epsilon_{it}$



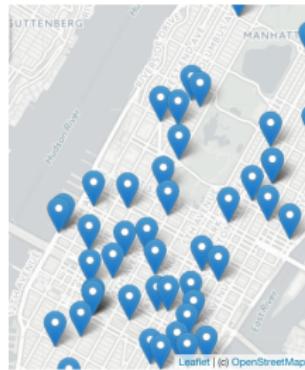
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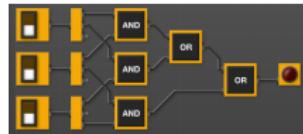
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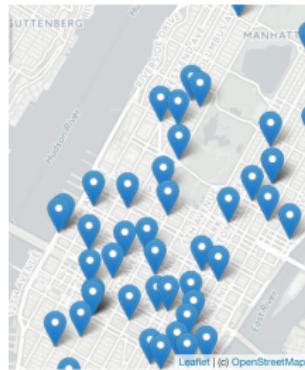
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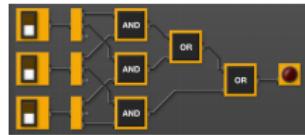
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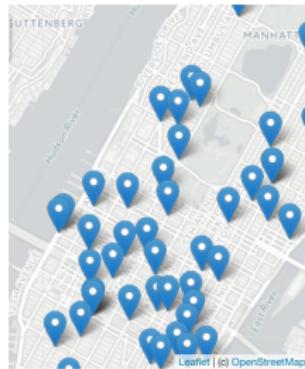
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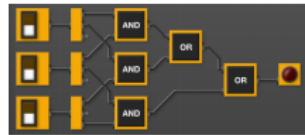
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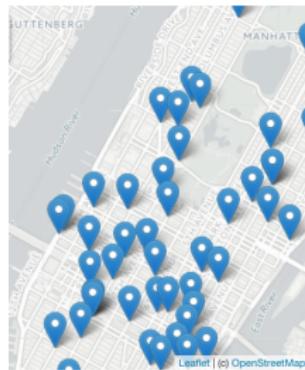


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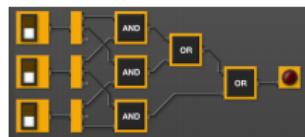
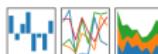


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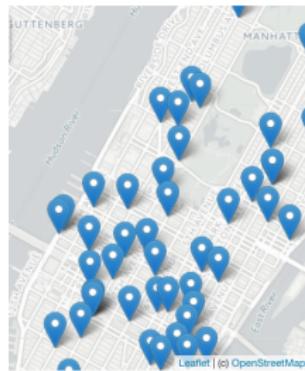


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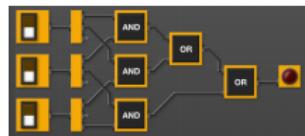
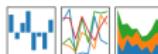


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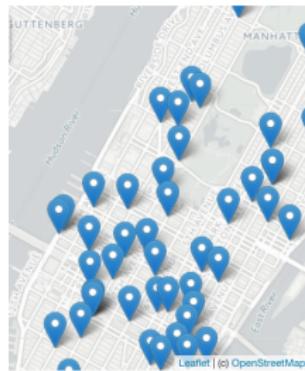


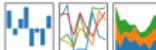
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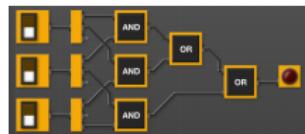


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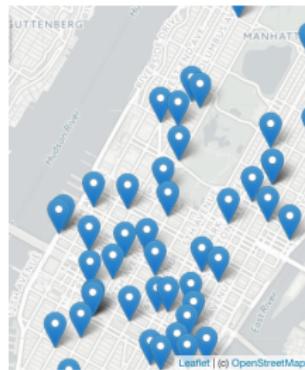


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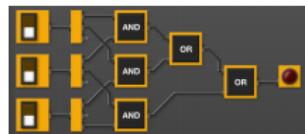


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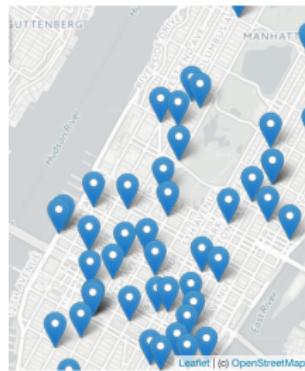


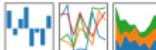
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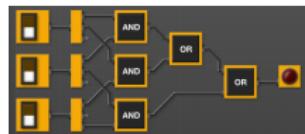


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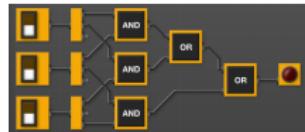
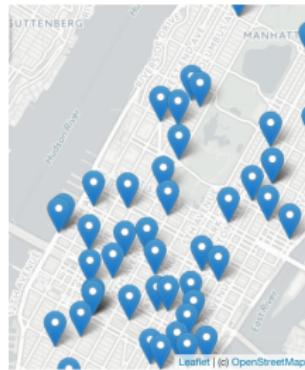


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 - ★ for C++.

Class Structure

Lecture:

- Tuesdays, 11:10am-12:25pm, 118 North



First "computers"

ENIAC, 1945.

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- Blackboard: visit ICIT for access issues.
- Gradescope: email invite sent Sunday.

Introductions: Your Turn



- Introduce yourself to two classmates (that you have not met before).
- Write down names & interesting fact on lecture slip.

Today's Topics



- Introduction to Python
- Definite Loops (`for`-loops)
- Turtle Graphics
- Algorithms

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- Our first language, Python, is popular for its ease-of-use, flexibility, and extensibility.

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- The first lab goes into step-by-step details of getting Python running.

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- A **programming language** is a stylized way of writing those commands.
- If you can write a logical argument or persuasive essay, you can write a program.
- Our first language, Python, is popular for its ease-of-use, flexibility, and extensibility.
- The first lab goes into step-by-step details of getting Python running.
- We'll look at the design and basic structure (no worries if you haven't tried it yet in lab).

First Program: Hello, World!



Demo in pythonTutor

First Program: Hello, World!

```
#Name: Thomas Hunter
```

```
#Date: September 1, 2017
```

```
#This program prints: Hello, World!
```

```
print("Hello, World!")
```

First Program: Hello, World!

```
#Name: Thomas Hunter           ← These lines are comments  
#Date: September 1, 2017       ← (for us, not computer to read)  
#This program prints: Hello, World!   ← (this one also)
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```

- Output to the screen is: Hello, World!
- Can replace Hello, World! with another string to be printed.

Variations on Hello, World!

```
#Name: L-M Miranda  
#Date: Hunter College HS '98  
#This program prints intro lyrics  
  
print('Get your education,')
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- Results in three lines of output.

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- Each print statement writes its output on a new line.
- Results in three lines of output.
- Can use single or double quotes, just need to match.

Turtles Introduction

- A simple, whimsical graphics package for Python



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- (Demo from webpage)
- (Fancier turtle demo)

Turtles Introduction

The screenshot shows a Python code editor with a file named `main.py`. The code uses the `turtle` module to draw a hexagon. The editor interface includes tabs for `main.py`, `Result`, and `Instructions`. The `Result` tab displays the output of the program, which is a purple hexagon with black star-shaped stamps at each vertex.

```
1 #A program that demonstrates turtles stamping
2
3 import turtle
4
5 taylor = turtle.Turtle()
6 taylor.color("purple")
7 taylor.shape("turtle")
8
9 for i in range(6):
10    taylor.forward(100)
11    taylor.stamp()
12    taylor.left(60)
```

- Creates a turtle, called `taylor`

Turtles Introduction

The screenshot shows a Python code editor with a toolbar at the top. The file tab shows "main.py". The code in the editor is:

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To the right of the code editor is a "Result" panel showing the output of the program: a purple hexagon drawn with a turtle, where each vertex has a purple star-like stamp.

- Creates a turtle, called `taylor`
- Changes the color (to purple) and shape (to turtle-shaped)

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To the right of the code window is a preview area titled "Result" which displays a purple hexagon with black star-shaped stamps at each vertex.

- Creates a turtle, called `taylor`
- Changes the color (to purple) and shape (to turtle-shaped)
- Repeats 6 times:
 - Move forward; stamp; and turn left 60 degrees

Group Work

Working in pairs or triples:

- ① Write a program that will draw a 10-sided polygon.
- ② Write a program that will repeat the line:

I'm lookin' for a mind at work!

three times.

Decagon Program

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3 import turtle
4
5 taylor = turtle.Turtle()
6 taylor.color("purple")
7 taylor.shape("turtle")
8
9 for i in range(6):
10     taylor.forward(100)
11     taylor.stamp()
12     taylor.left(60)
```

The "Result" panel shows a purple hexagon drawn on a white background, with a purple star at each vertex where the turtle stamped.

- Start with the hexagon program.

Decagon Program

The screenshot shows a code editor interface with a toolbar at the top. The file tab shows "main.py". The code in the editor is:

```
1 #A program that demonstrates turtles stamping
2
3 import turtle
4
5 taylor = turtle.Turtle()
6 taylor.color("purple")
7 taylor.shape("turtle")
8
9 for i in range(6):
10     taylor.forward(100)
11     taylor.stamp()
12     taylor.left(60)
```

The "Result" panel shows a purple hexagon drawn on a white background, with six purple star-like stamps at each vertex where the turtle has stamped.

- Start with the hexagon program.
- Has 10 sides (instead of 6), so change the `range(6)` to `range(10)`.

Decagon Program

The screenshot shows a code editor interface with a toolbar at the top. The file tab shows "main.py". The code in the editor is:

```
1 #A program that demonstrates turtles stamping
2
3 import turtle
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5 taylor = turtle.Turtle()
6 taylor.color("purple")
7 taylor.shape("turtle")
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9 for i in range(6):
10    taylor.forward(100)
11    taylor.stamp()
12    taylor.left(60)
```

To the right of the editor is a "Result" window showing a purple decagon drawn on a white background. The decagon has ten sides and ten purple star-shaped stamps at each vertex. Above the Result window is a "Save" button and a user icon.

- Start with the hexagon program.
- Has 10 sides (instead of 6), so change the `range(6)` to `range(10)`.
- Makes 10 turns (instead of 6),
so change the `taylor.left(60)` to `taylor.left(360/10)`.

Work Program

- ② Write a program that will repeat the line:

I'm lookin' for a mind at work!

three times.

Work Program

- ② Write a program that will repeat the line:

I'm lookin' for a mind at work!

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- Repeats three times, so, use `range(3)`:

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for i in range(3):
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Work Program

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- Instead of turtle commands, repeating a print statement.

Work Program

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three times.

- Repeats three times, so, use `range(3)`:

```
for i in range(3):
```

- Instead of turtle commands, repeating a print statement.

- Completed program:

```
# Your name here!
for i in range(3):
    print("I'm lookin' for a mind at work!")
```

What is an Algorithm?

From our textbook:

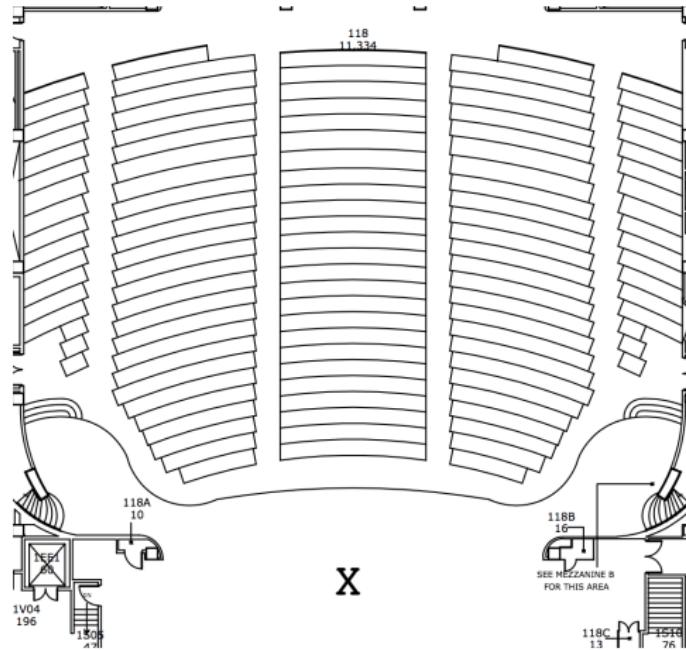
- An **algorithm** is a process or set of rules to be followed to solve a problem.

What is an Algorithm?

From our textbook:

- An **algorithm** is a process or set of rules to be followed to solve a problem.
- Programming is a skill that allows a computer scientist to take an algorithm and represent it in a notation (a program) that can be followed by a computer.

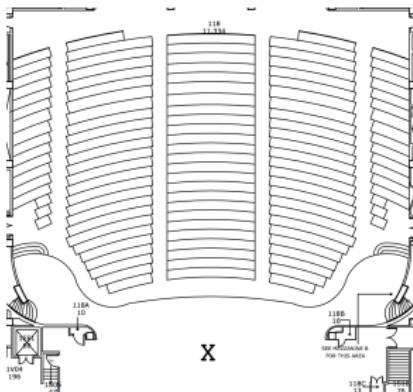
Group Work



Working in pairs or triples:

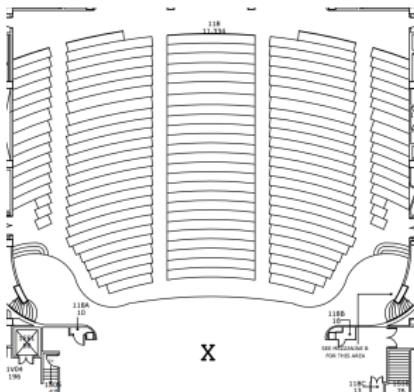
- ① On the floorplan, mark your current location.
- ② Write step-by-step directions to get to/from X.

Group Work



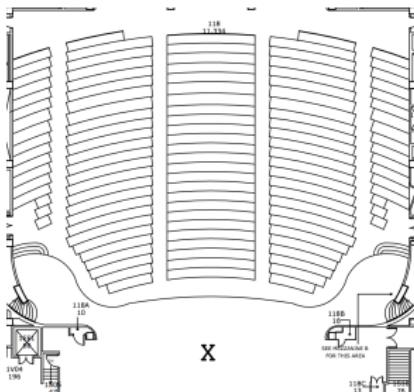
- Find another group, near you, that's going in the “opposite” way.

Group Work



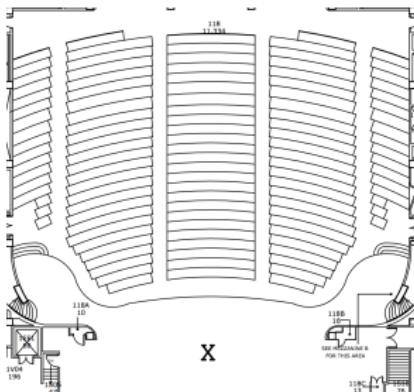
- Find another group, near you, that's going in the “opposite” way.
- Follow the directions to get to X.

Group Work



- Find another group, near you, that's going in the “opposite” way.
- Follow the directions to get to X.
- Follow the other set of directions from X back to your seat.

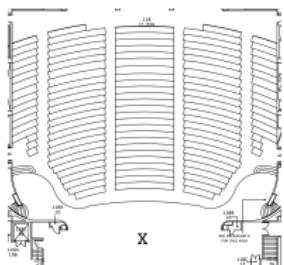
Group Work



- Find another group, near you, that's going in the “opposite” way.
- Follow the directions to get to X.
- Follow the other set of directions from X back to your seat.
- Annotate any changes needed to the directions.

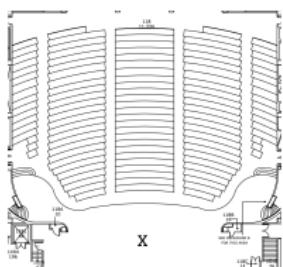
Recap

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



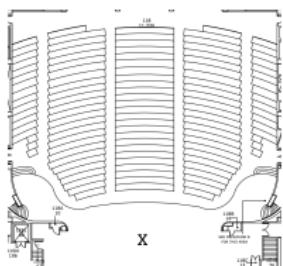
Recap

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

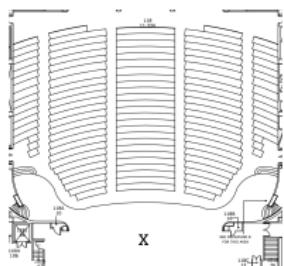


Recap

- On lecture slip, write down a topic you wish we had spent more time (and why).
- Writing precise algorithms is difficult.
- In Python, we introduced:

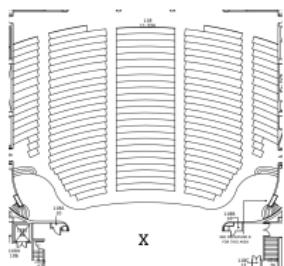


Recap



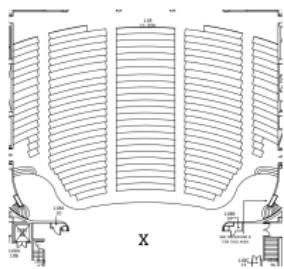
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 - ▶ **strings**, or sequences of characters,

Recap



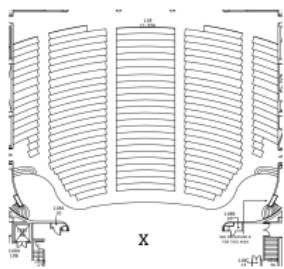
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Recap



- On lecture slip, write down a topic you wish we had spent more time (and why).
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- In Python, we introduced:
 - ▶ `strings`, or sequences of characters,
 - ▶ `print()` statements,
 - ▶ `for`-loops with `range()` statements, &

Recap



- On lecture slip, write down a topic you wish we had spent more time (and why).
- Writing precise algorithms is difficult.
- In Python, we introduced:
 - ▶ **strings**, or sequences of characters,
 - ▶ **print()** statements,
 - ▶ **for-loops** with **range()** statements, &
 - ▶ **variables** containing turtles.

Lecture Slips & Writing Boards



- Turn in lecture slips & writing boards as you leave...