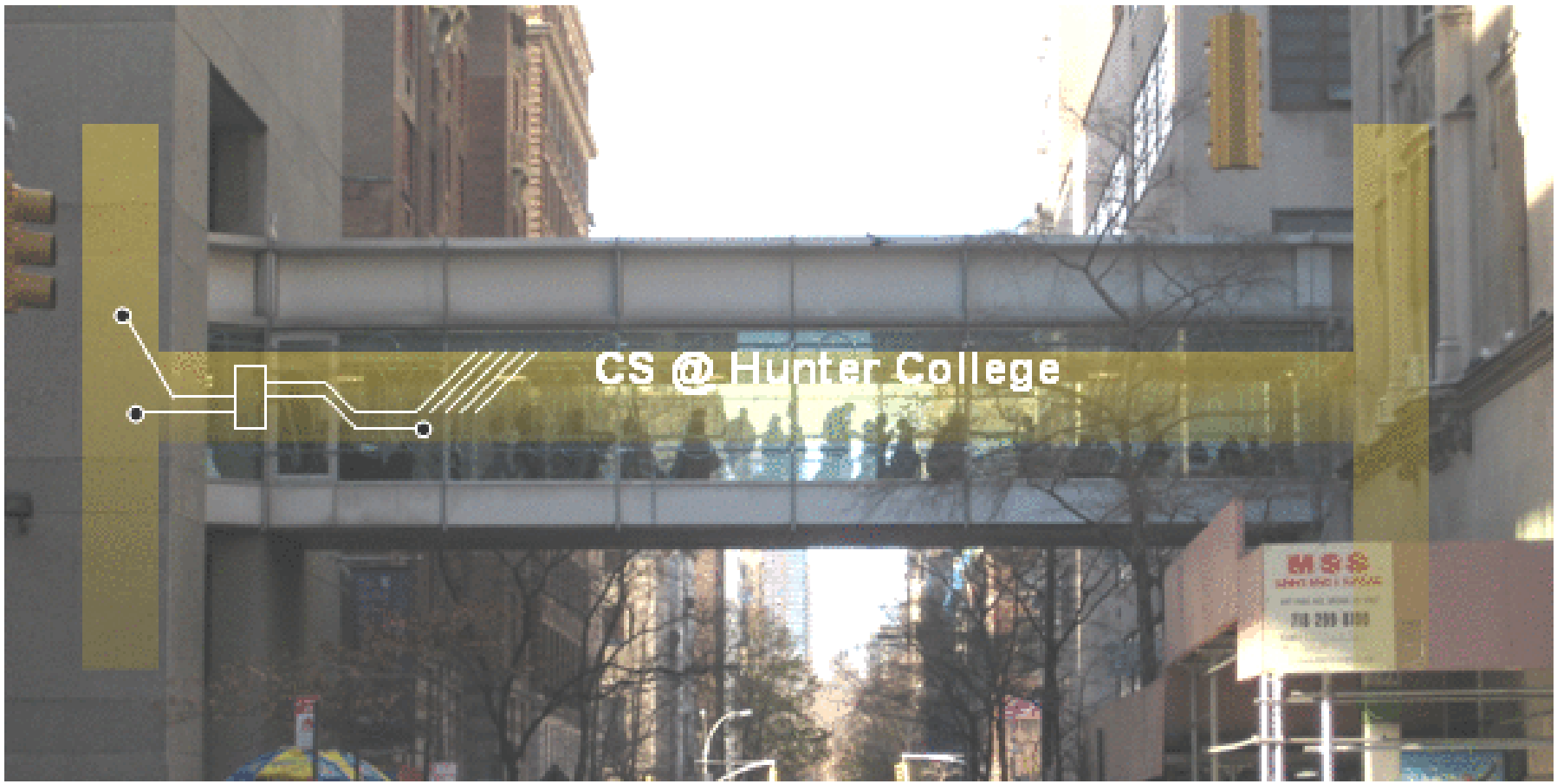
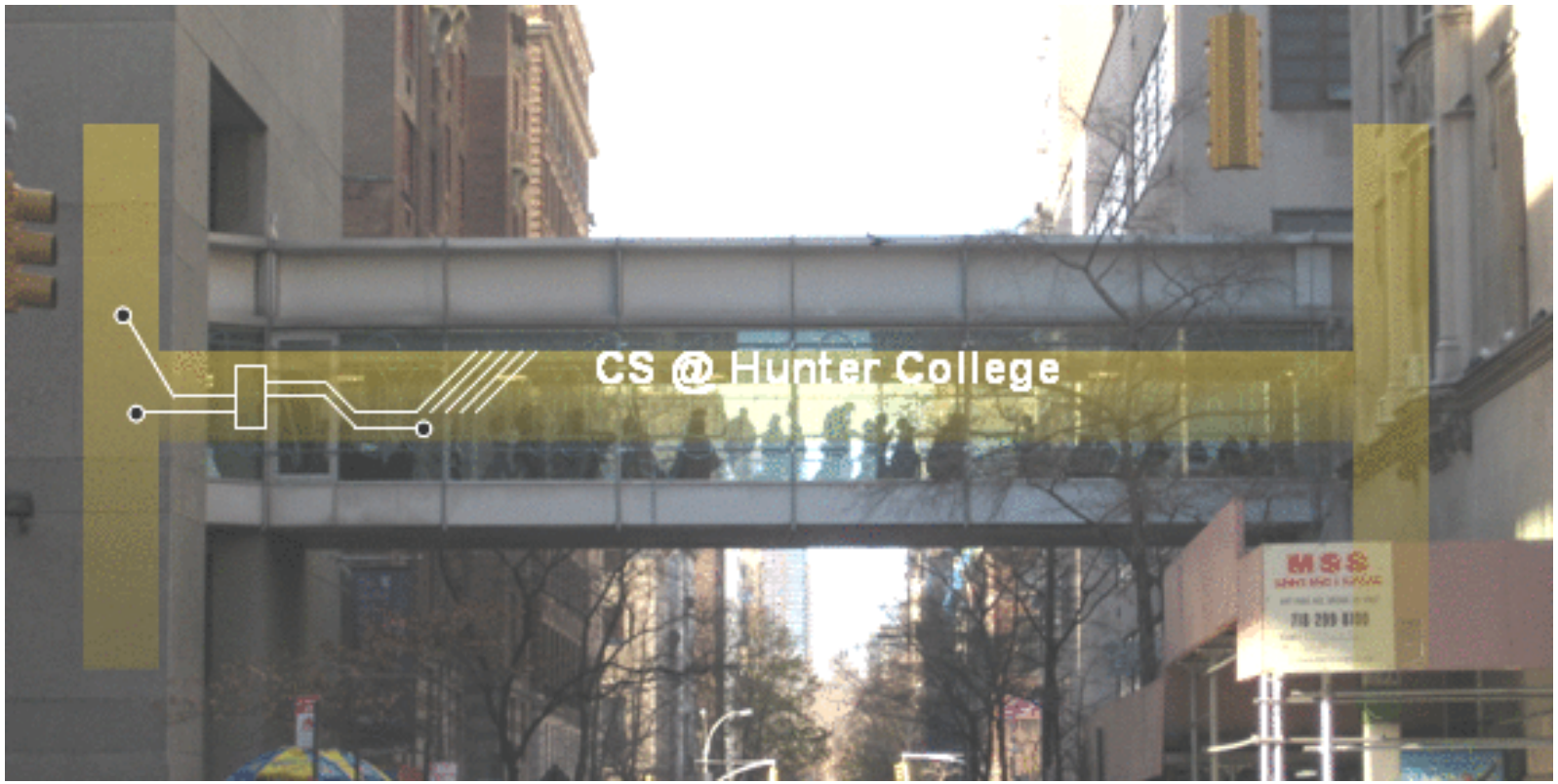
CSci 127: Introduction to Computer Science



hunter.cuny.edu/csci

Welcome



- This lecture will be recorded

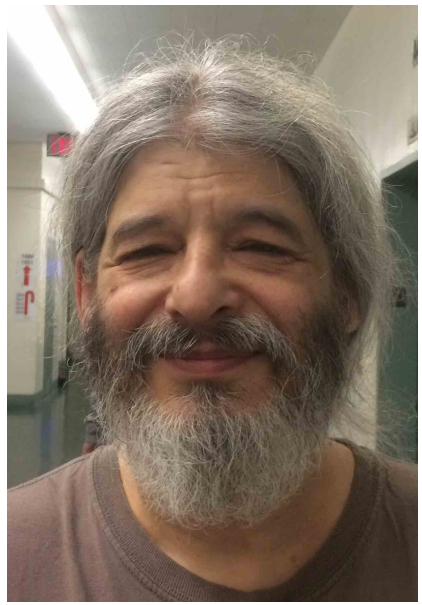
Introductions: Course Designers

Dr. Katherine St. John

Professor,
Interim Chair

Dr. William Sakas

Associate Professor,
Chair



Prof. Eric Schweitzer

Undergraduate Program
Coordinator

Introductions: Instructors

Katherine Howitt

Early College Initiative

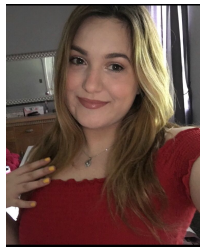
Dr. Tiziana Ligorio

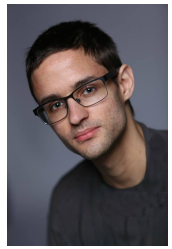
Large Lecture Course Coordinator

Introductions: Undergraduate Teaching Assistants

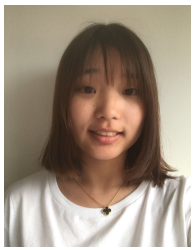

Aida Jevric


Arterio Rodrigues


Caiitlin Selca

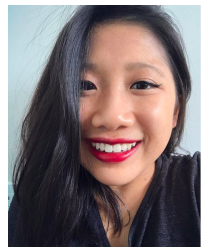

Illya Baburashvili


Leonardo Matone


Liulan Zheng


Lola Samigjonova

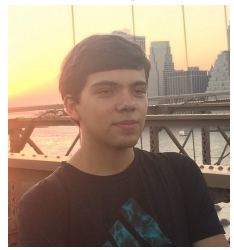

Mandy Yu


Nancy Ng


Nga Yu Lo


Owen Kunhardt

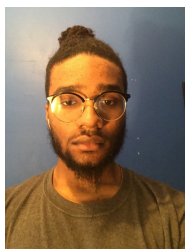

Patrick Chaca


Ryan Chevarria


Sadab Hafiz


Shantel Dixon


Stephanie Yung


Tyler Robinson

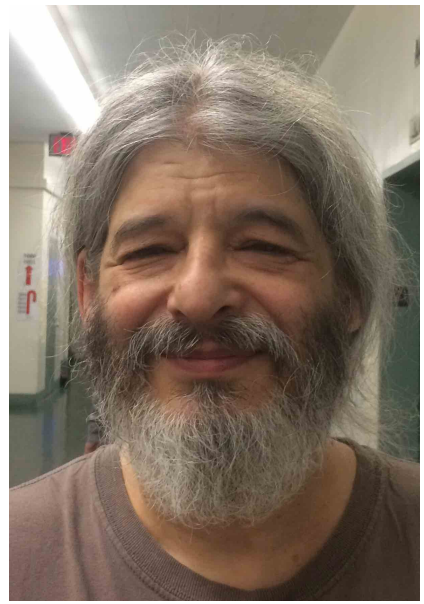

Yash Mahtani

Introductions: Advisors

Emely Peguero

Pre-majors & Early Majors

emely.pegueronova@hunter.cuny.edu



Eric Schweitzer

Undergraduate Program Coordinator

eschweit@hunter.cuny.edu

Where to find Course Content

- Course Website: https://huntercsci127.github.io/s21.html

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- Course Website: https://huntercsci127.github.io/s21.html
- Blackboard

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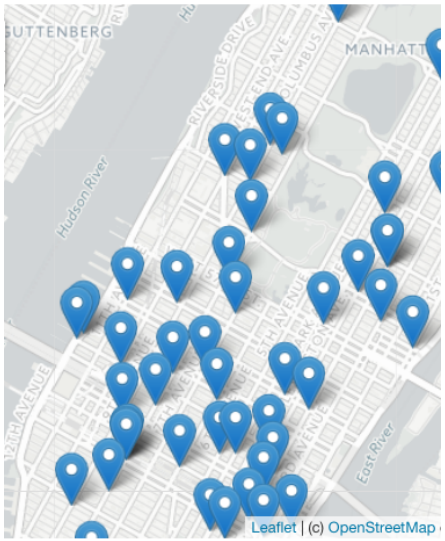
- Blackboard
- Gradescope (assessment)

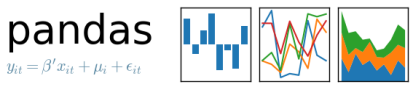
Syllabus

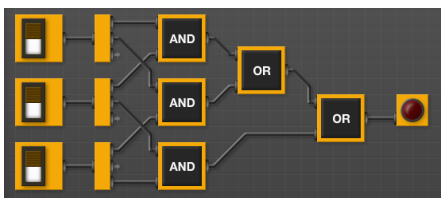
CSci 127: Introduction to Computer Science
Catalog Description: 3 hours, 3 credits: This course presents an overview of computer science (CS) with an emphasis on **problem-solving and computational thinking through 'coding'***: computer programming for beginners...*

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.

Syllabus: Topics







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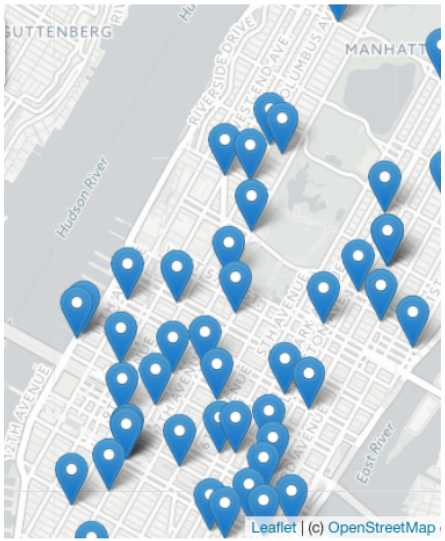
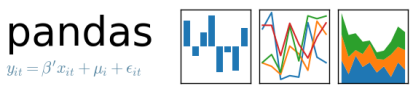
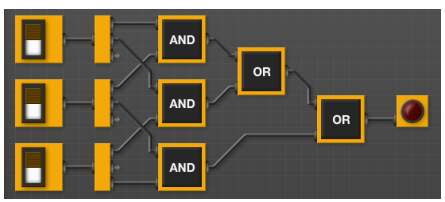
Syllabus: Topics







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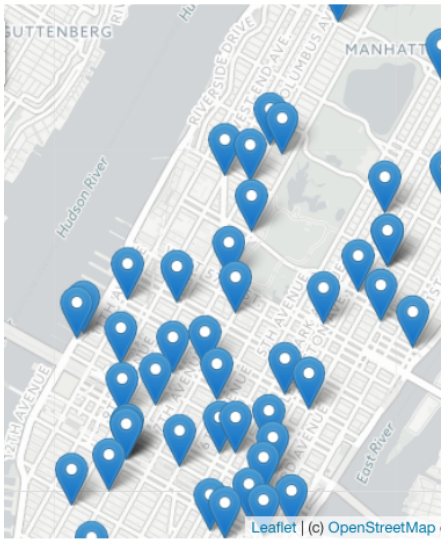
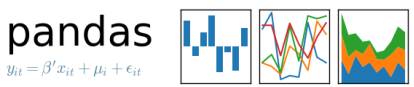
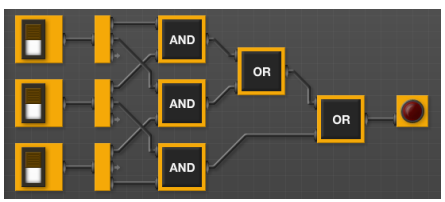
- Organized like a fugue, with variations on this theme:

Syllabus: Topics







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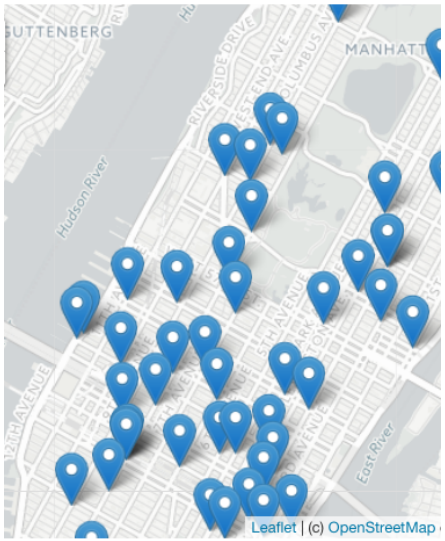
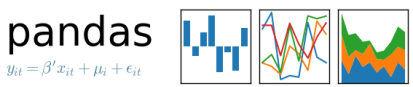
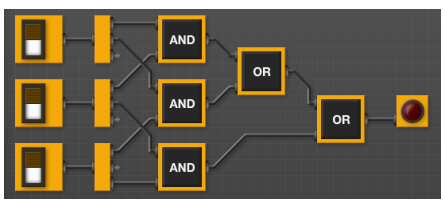
Syllabus: Topics







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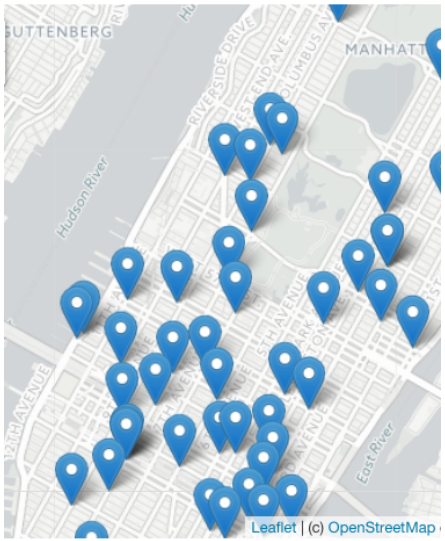

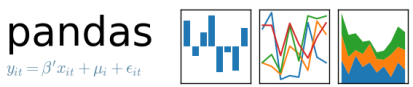

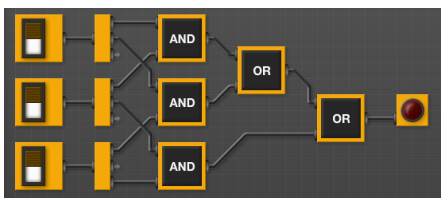

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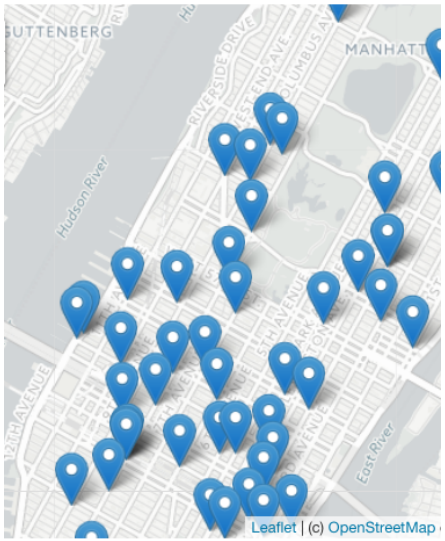
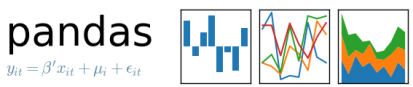
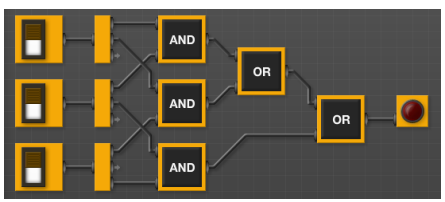
  - See constructs again:

Syllabus: Topics







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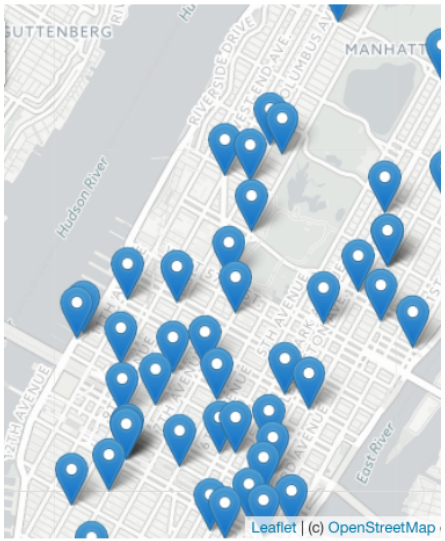
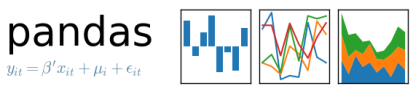
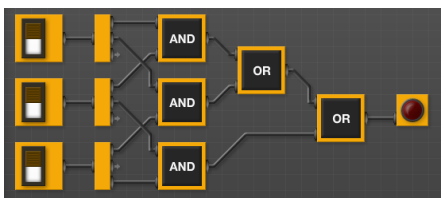
Syllabus: Topics







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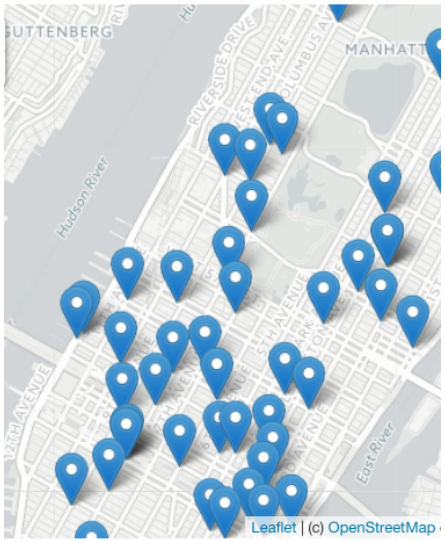
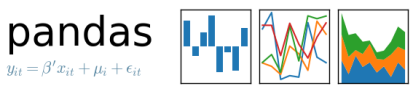
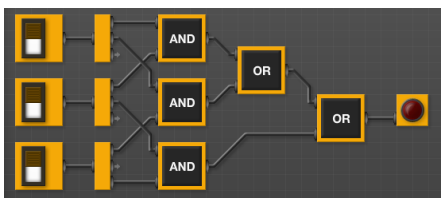
Syllabus: Topics







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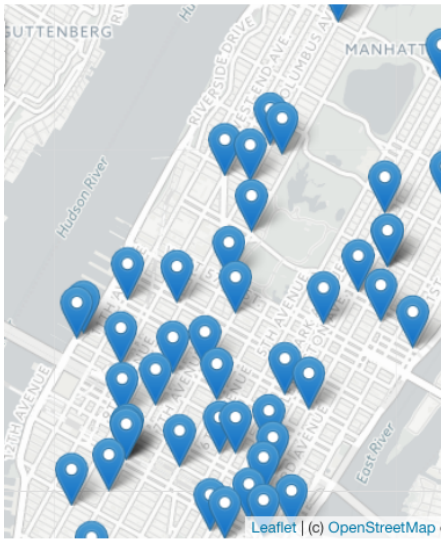
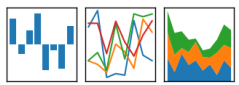
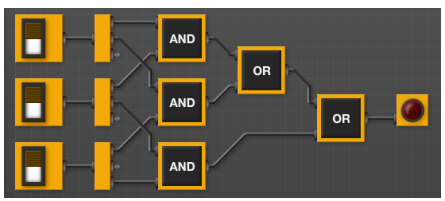
Syllabus: Topics



pandas

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





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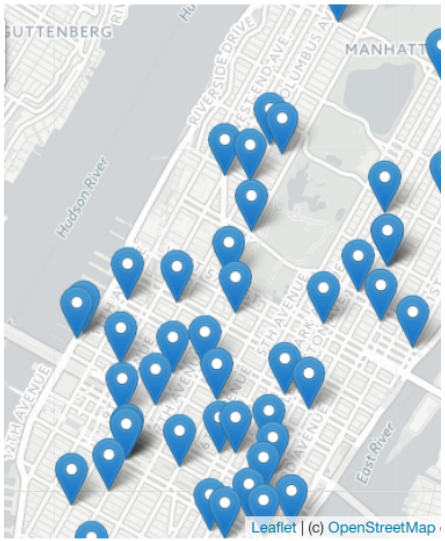
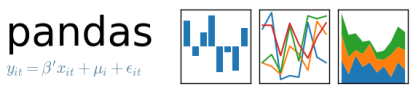
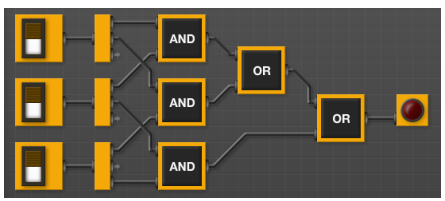
Syllabus: Topics







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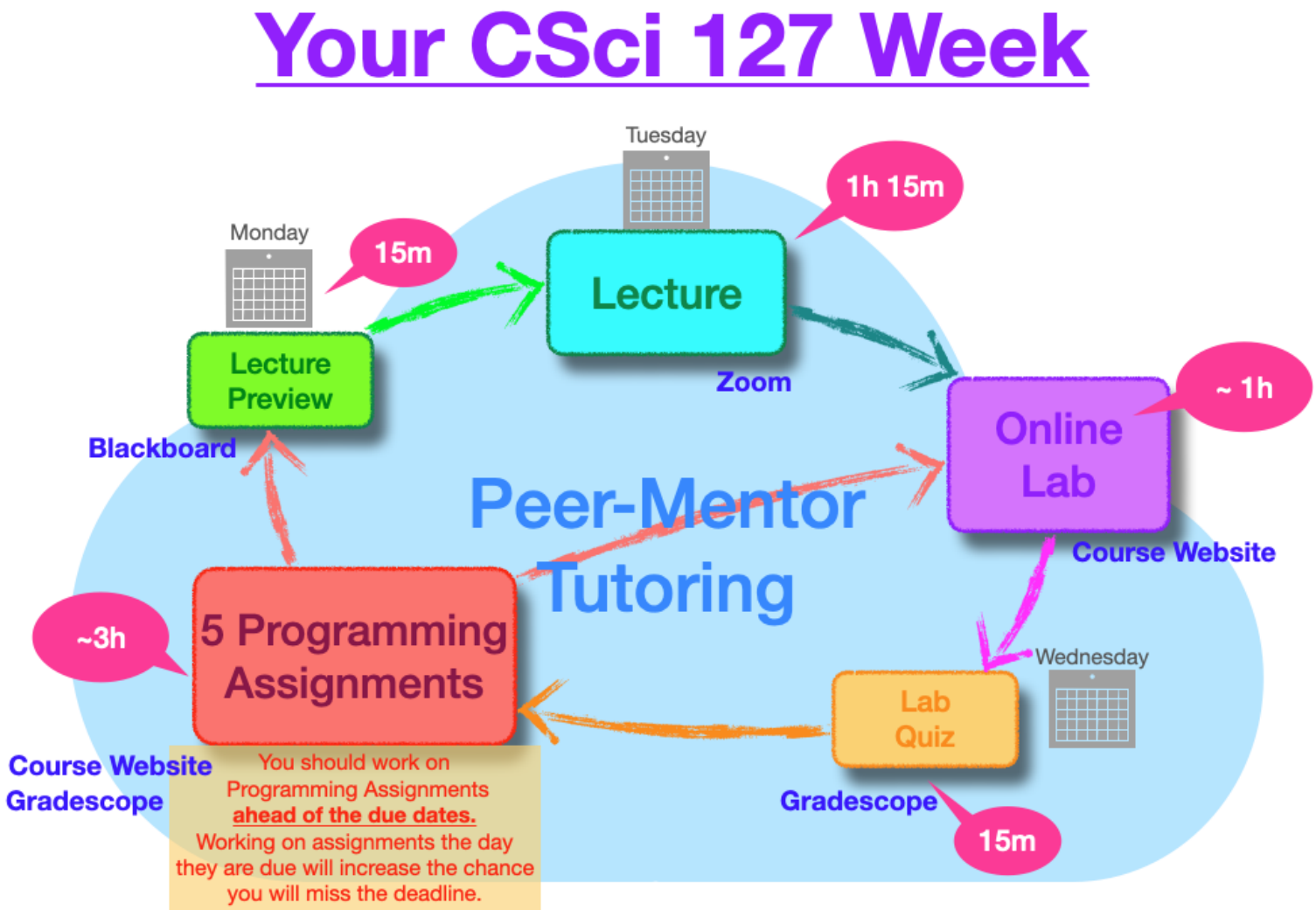
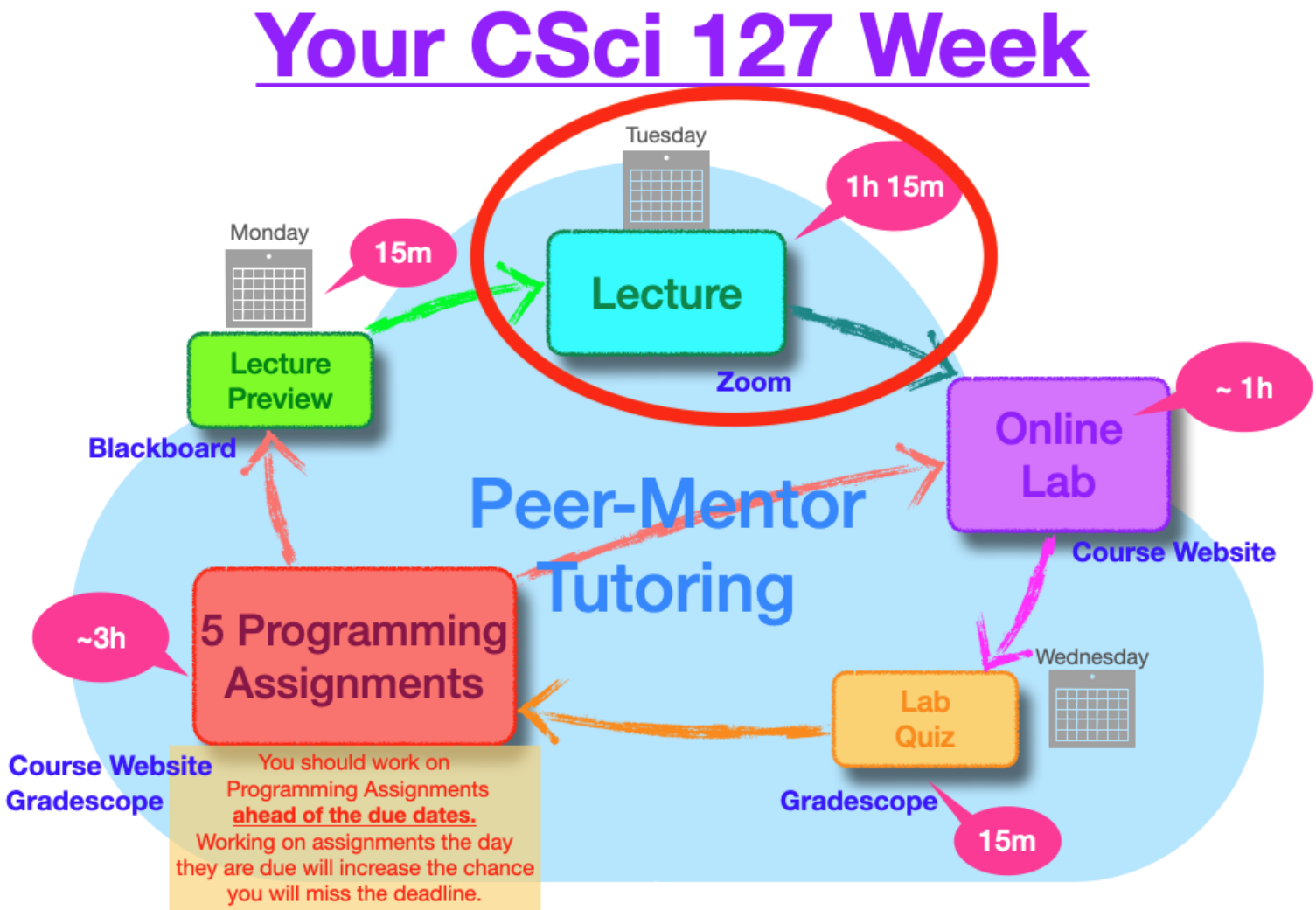
    - ★ for C++.

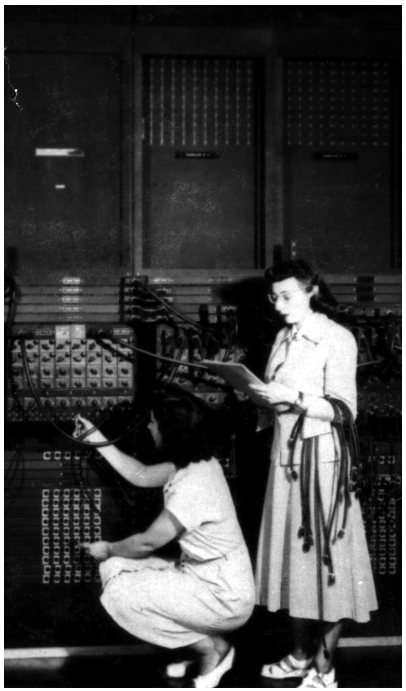
Course Structure



Course Structure



Lecture

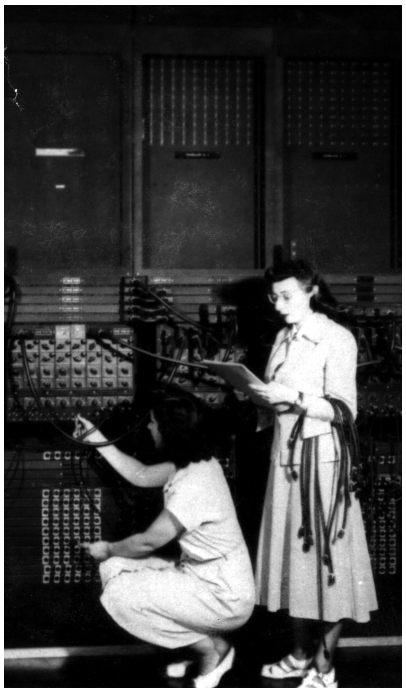


First "computers"

ENIAC, 1945.

- Tuesdays, 9:45-11:00am, on Zoom.

Lecture



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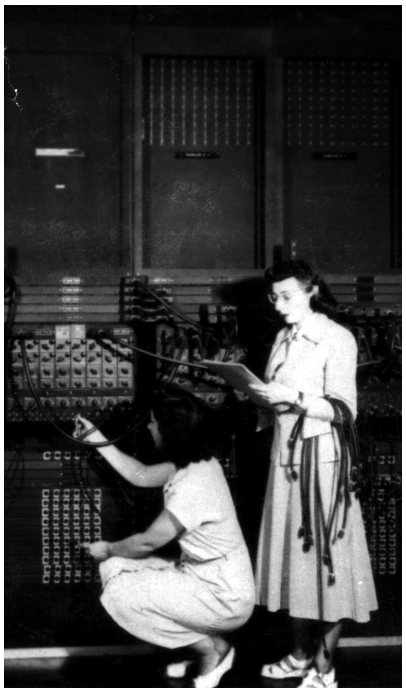
- Mix of explanation, challenges & active concept application.

Lecture



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ENIAC, 1945.

- Tuesdays, 9:45-11:00am, on Zoom.
- Mix of explanation, challenges & active concept application.
- Lecture Preview: 15 minutes Quiz on Blackboard **prior** to each lecture (opens on Mondays).

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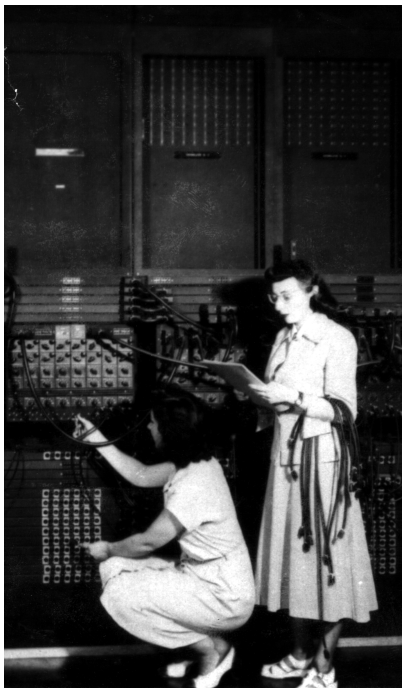

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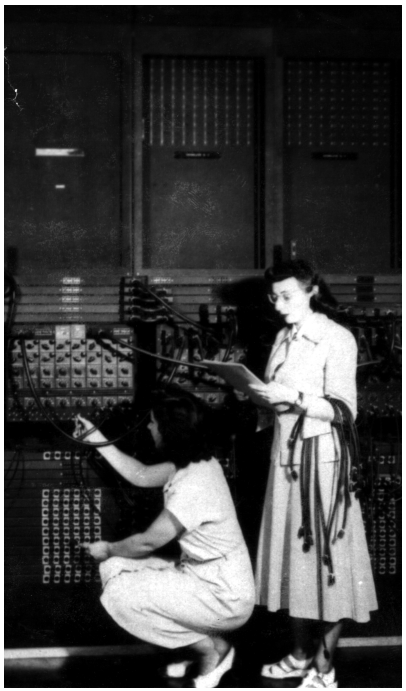

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- Ask questions in Q&A.

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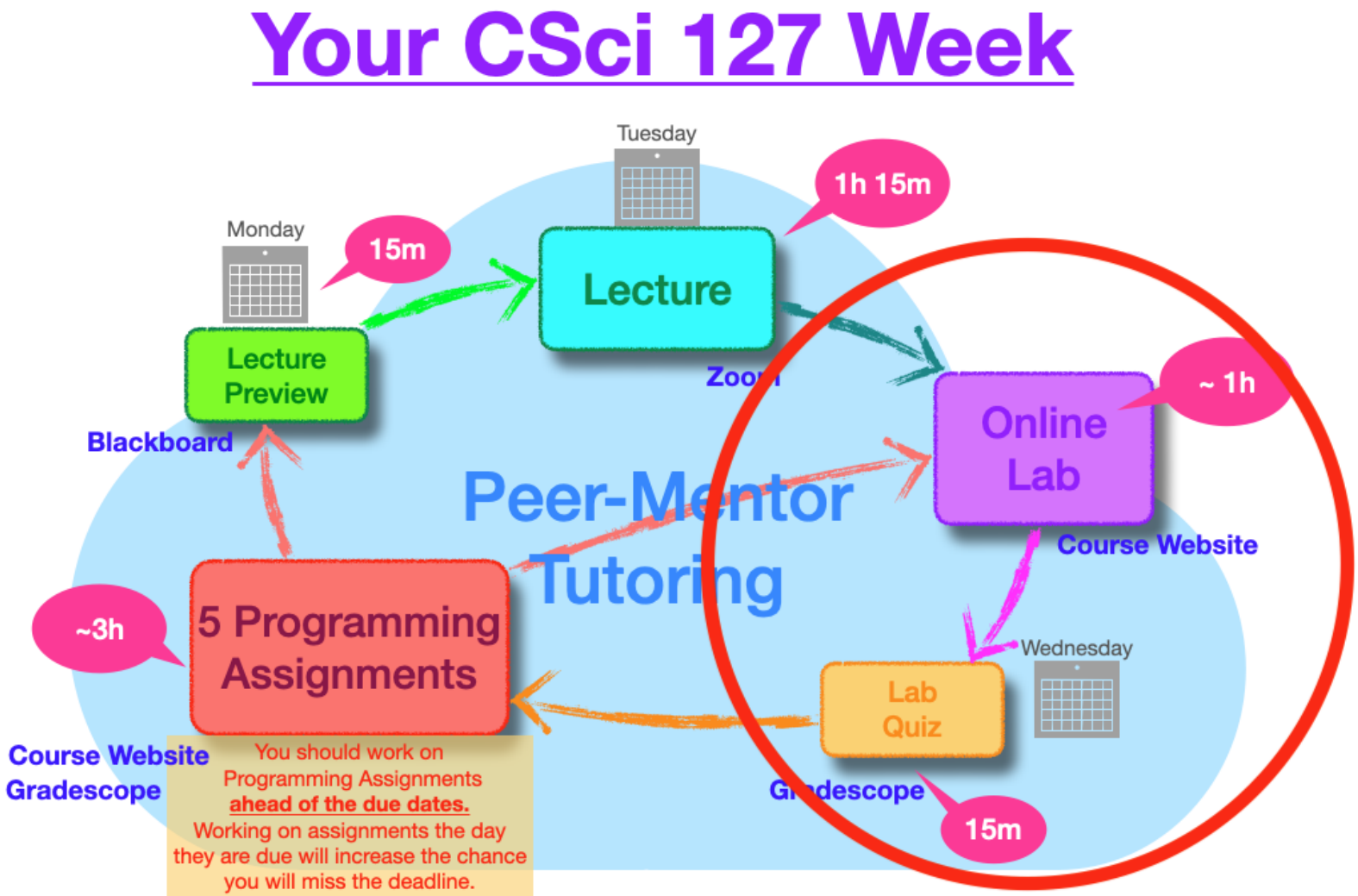
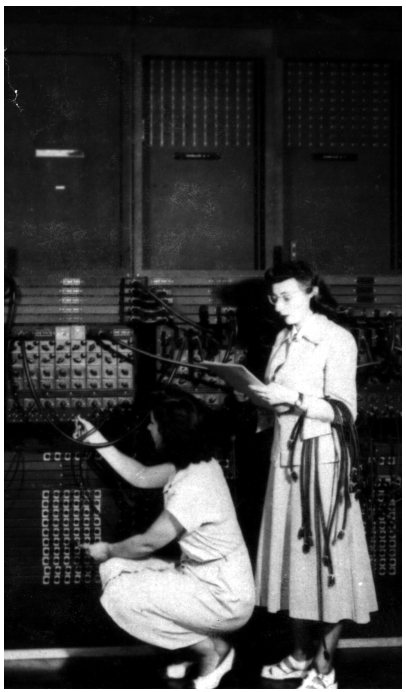


Online Lab & Quiz



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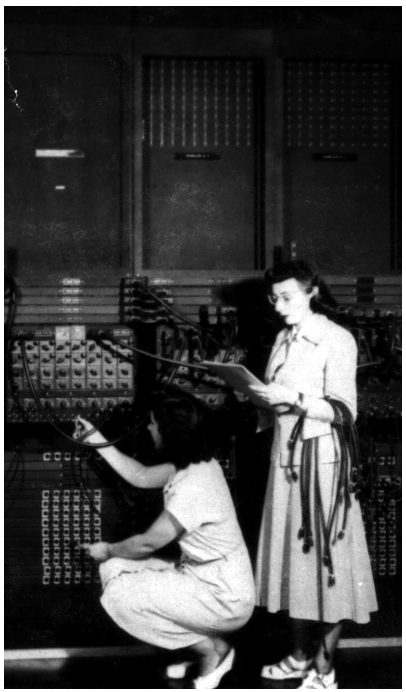

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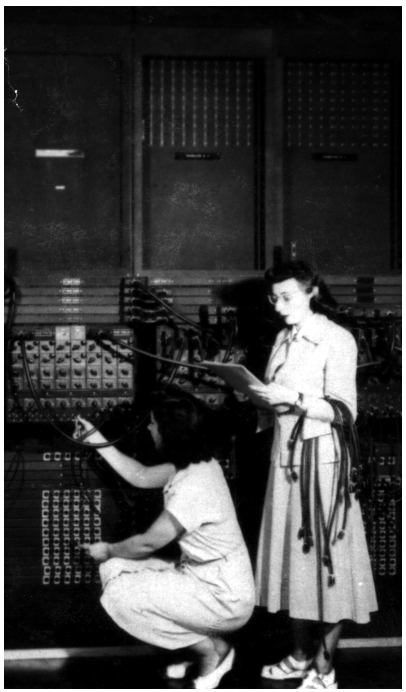

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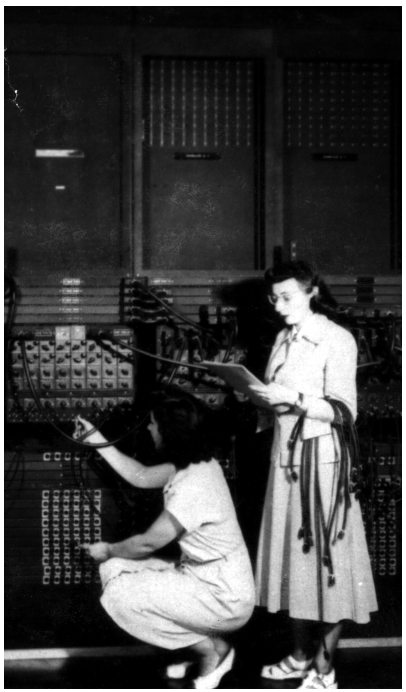

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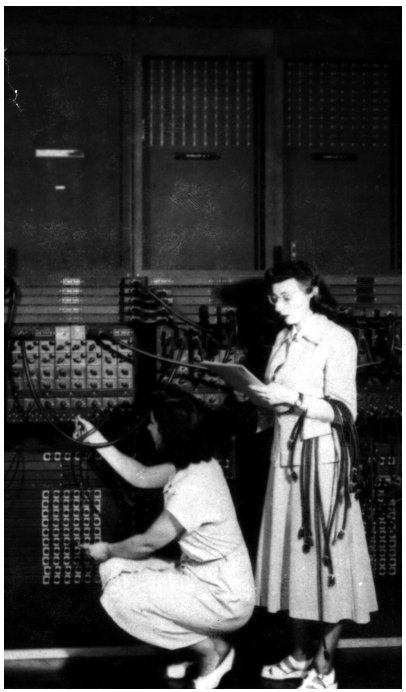

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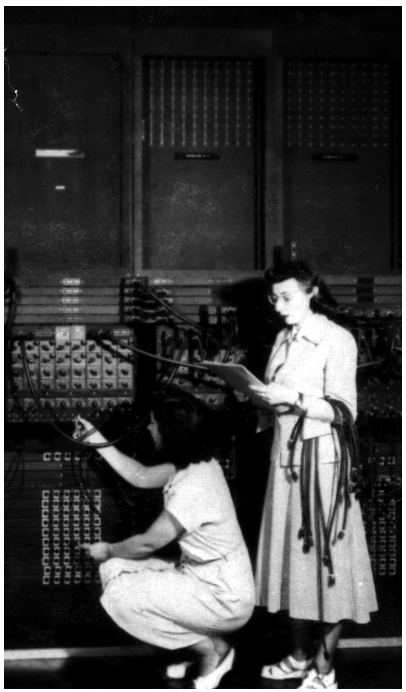

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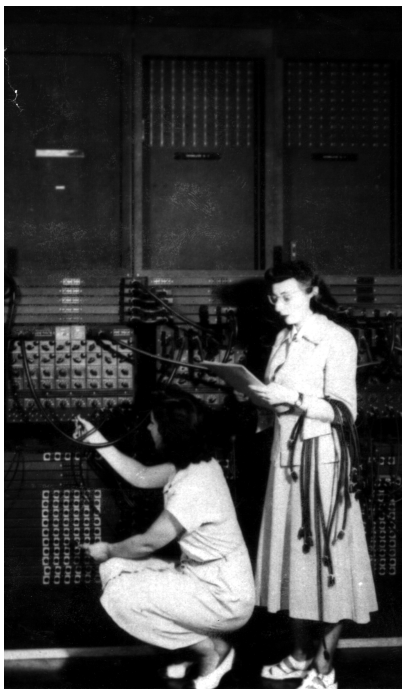

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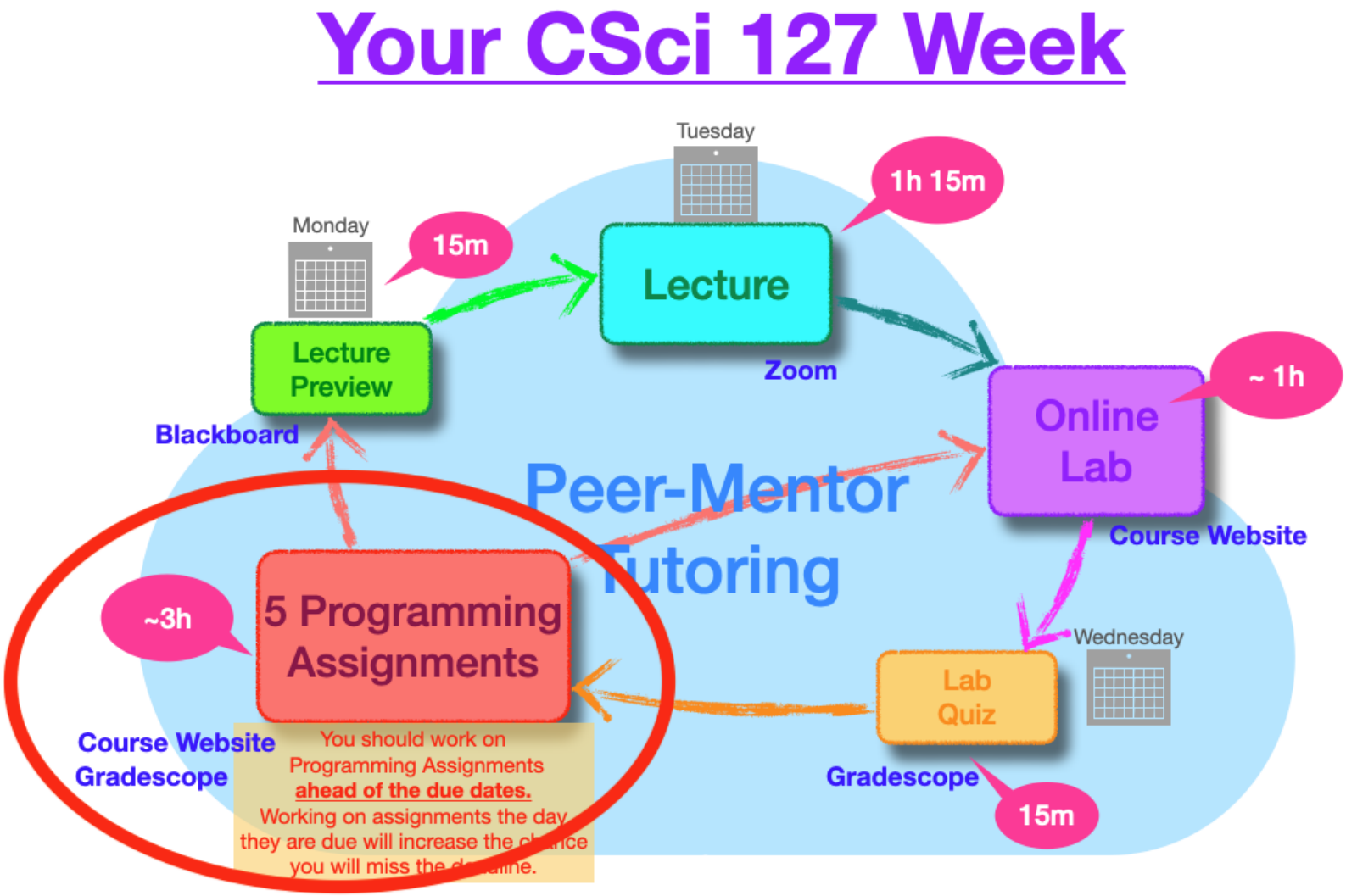
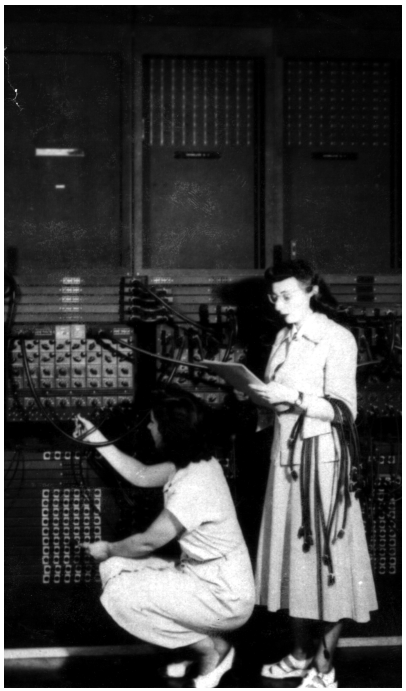
- Labs found on course website (show)

Course Structure



Homework



First "computers"

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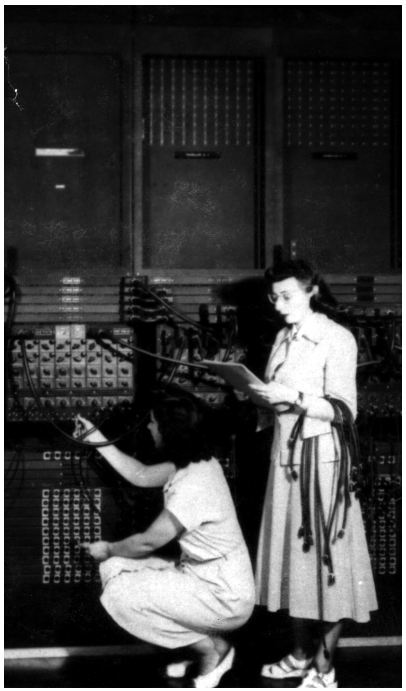
Each Week:

- **5 Programming Assignments.**

Homework



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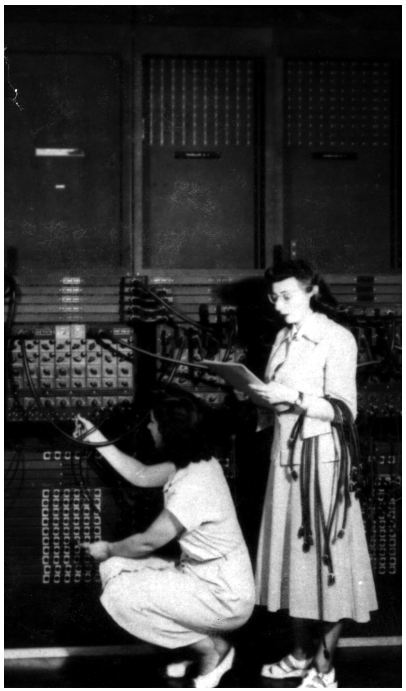
Each Week:

- **5 Programming Assignments.**
- Description on Course Webpage.

Homework



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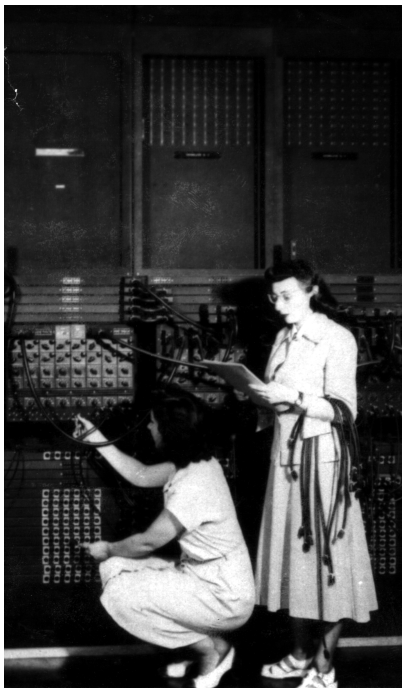

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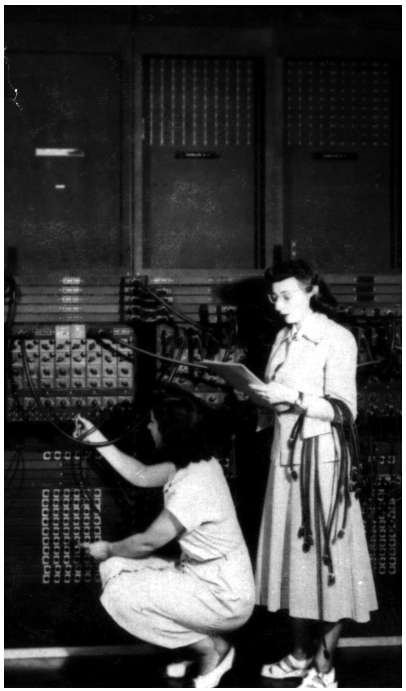

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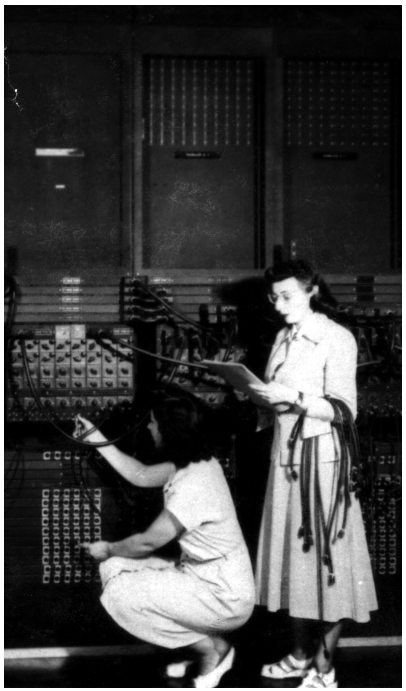

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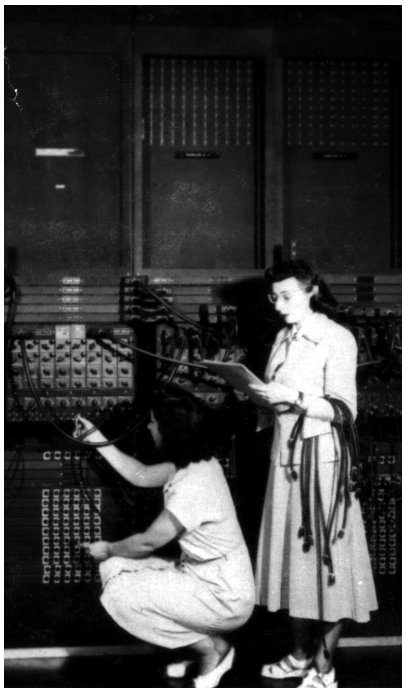
- Submit to Gradescope.
- Multiple submissions accepted.
- Watch Orientation Video: How to Write and Submit a Python Program (link on Blackboard)

Make Your Schedule!



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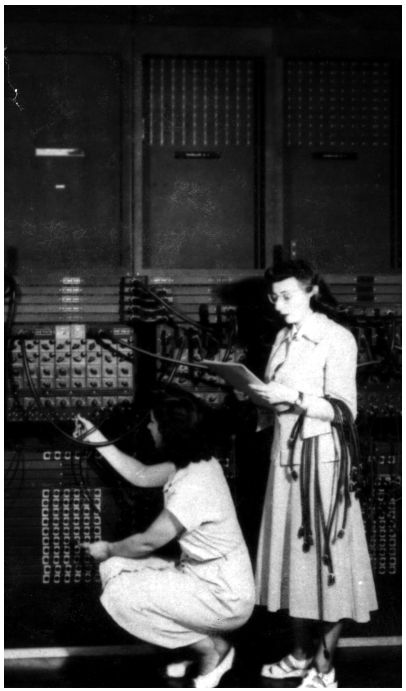

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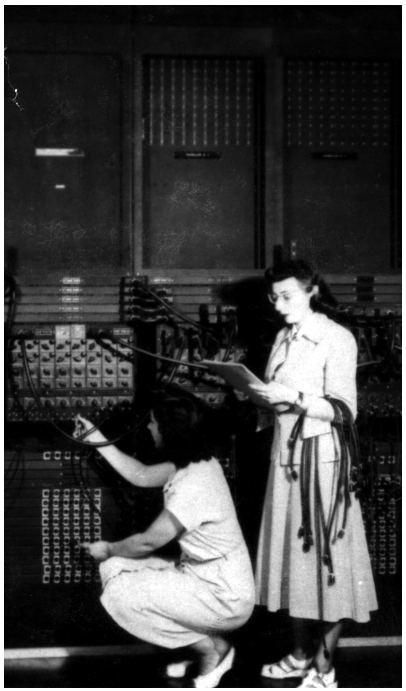

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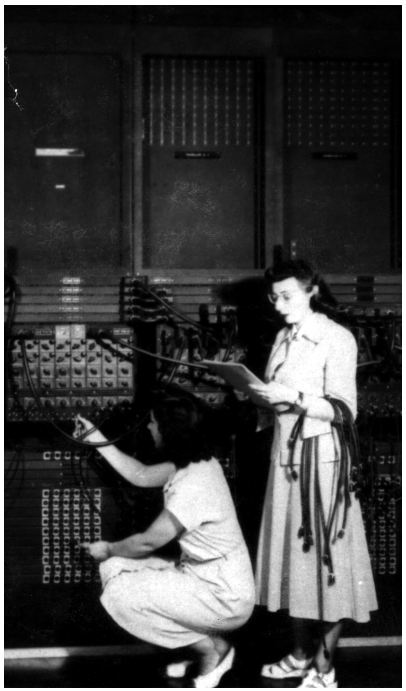

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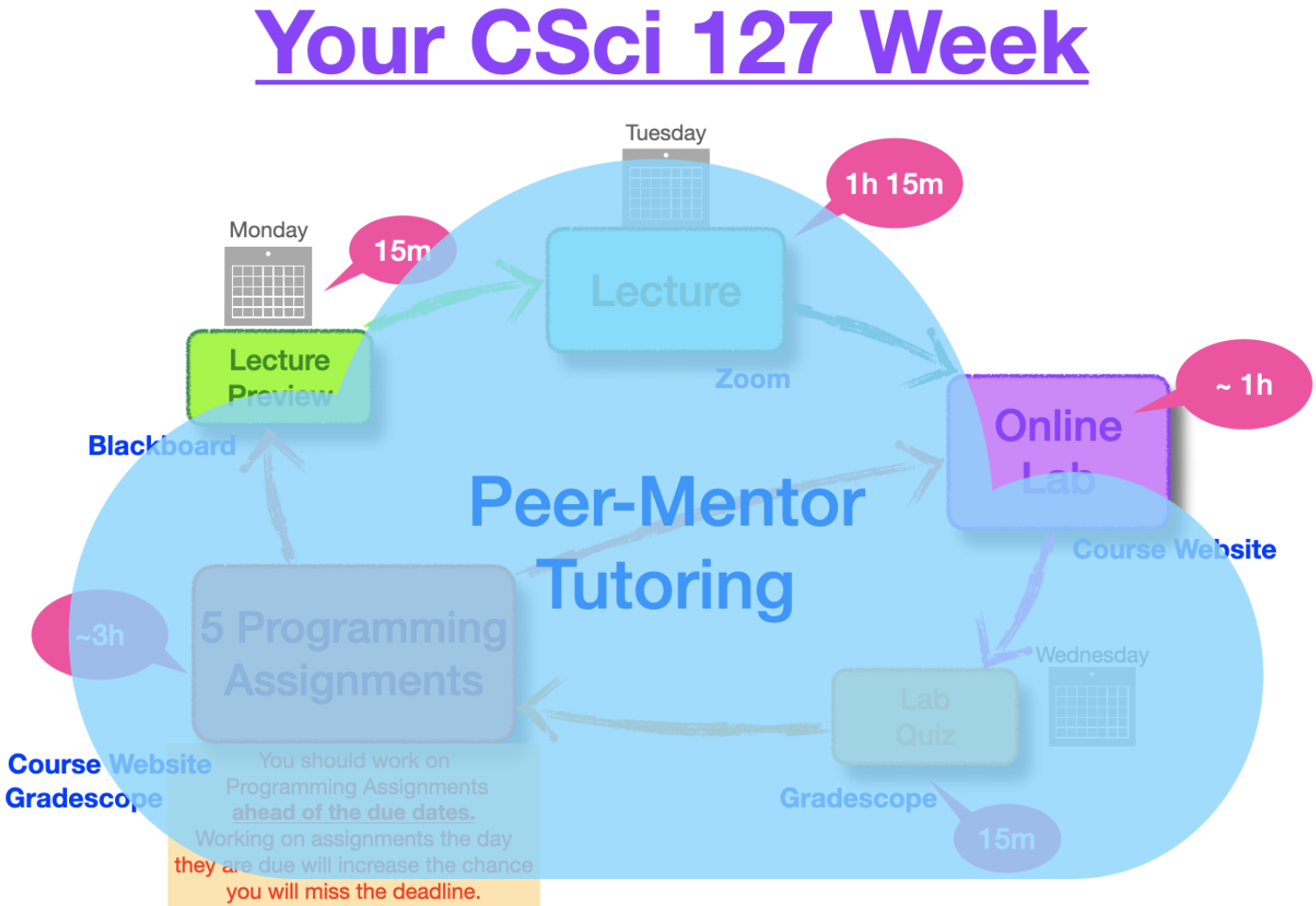
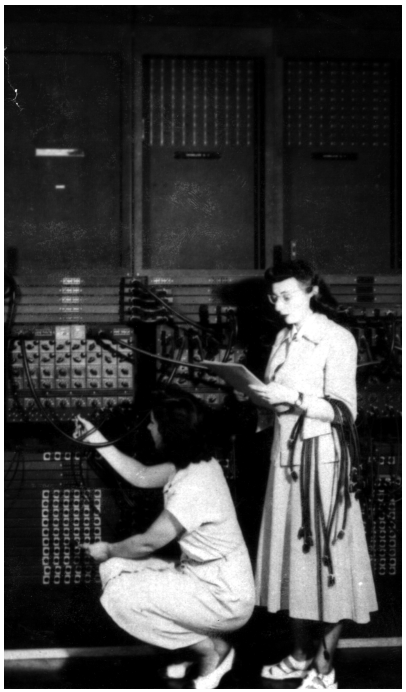
Course Structure



Help and Support



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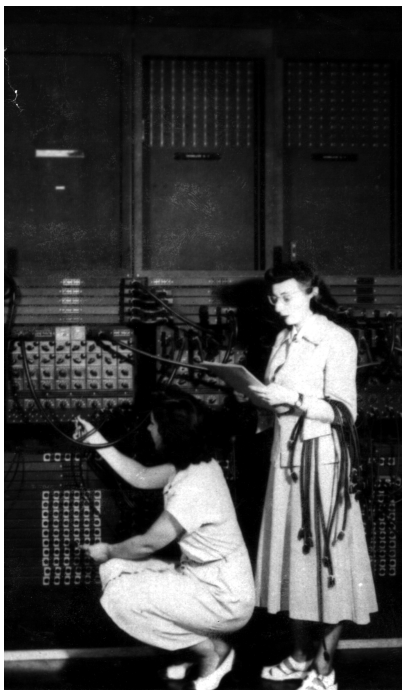

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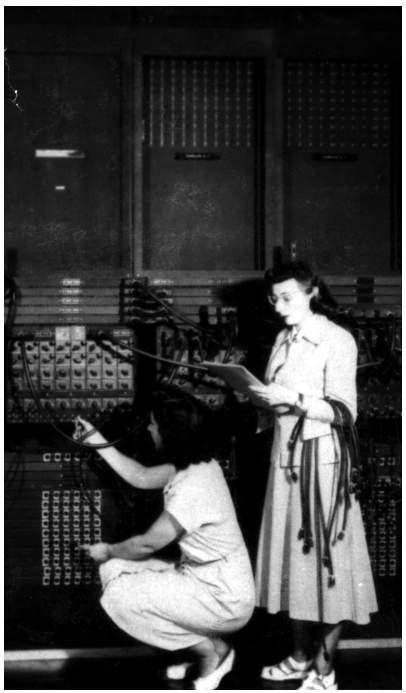

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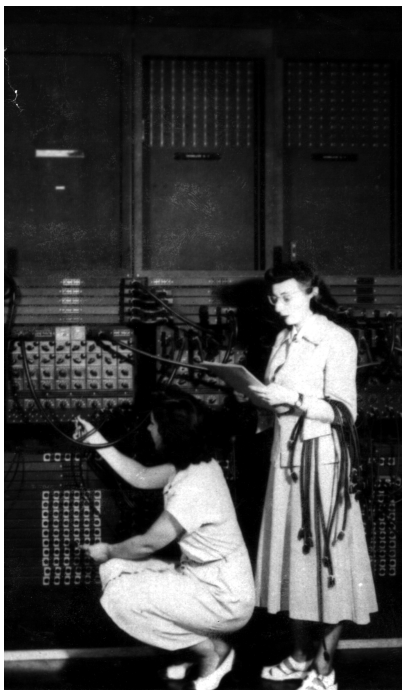

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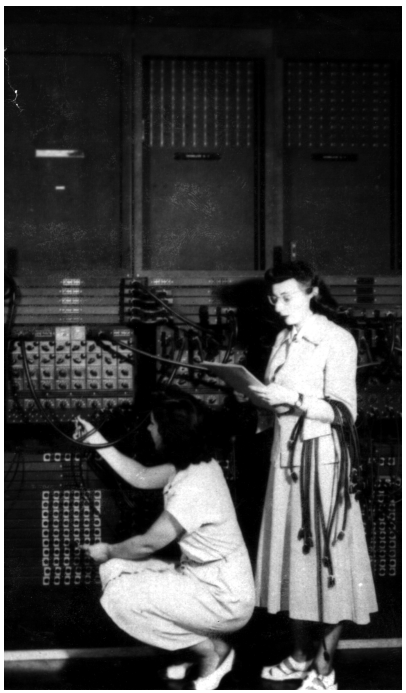

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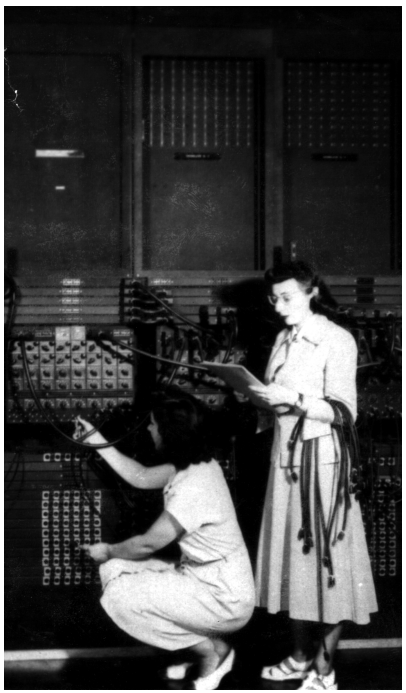

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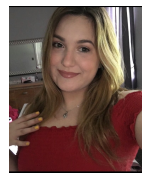
Undergraduate Teaching Assistants

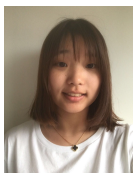

Aida Jevric


Arterio Rodrigues


Caiitlin Selca


Illya Baburashvili


Leonardo Matone


Liulan Zheng


Lola Samigjonova

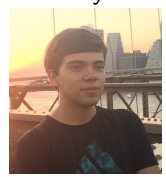

Mandy Yu


Nancy Ng


Nga Yu Lo


Owen Kunhardt

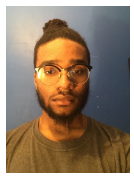

Patrick Chaca


Ryan Chevarria


Sadab Hafiz


Shantel Dixon


Stephanie Yung


Tyler Robinson

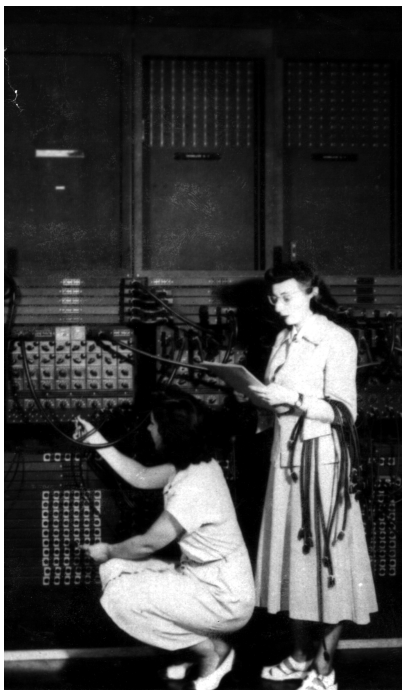

Yash Mahtani

Meet & Greet

Friday Feb 5, 5-6pm

Tutoring IS Important

Academic Dishonesty



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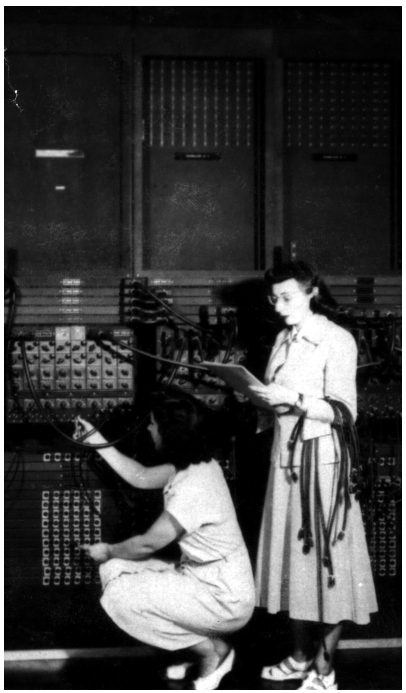

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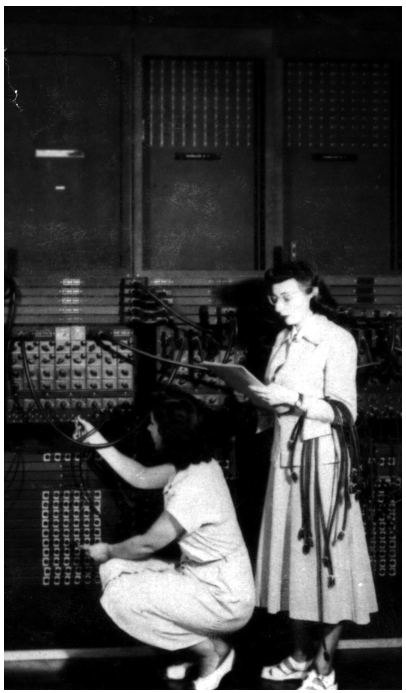

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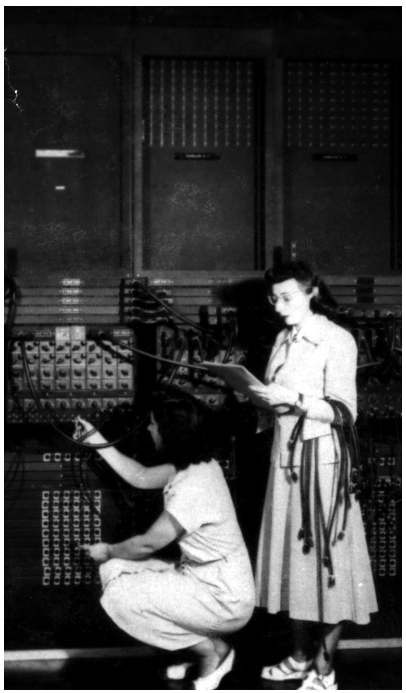

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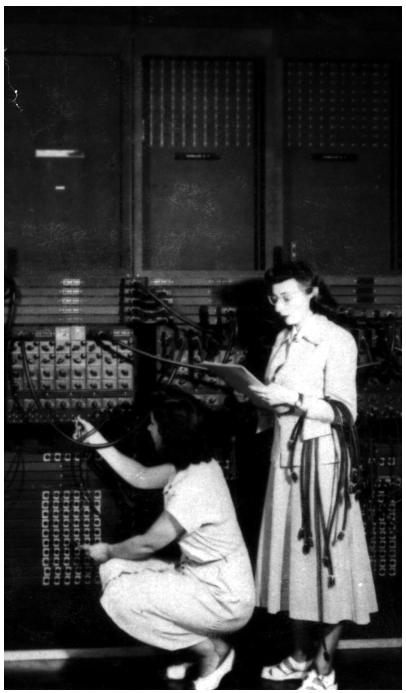
Academic Dishonesty



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- *The person who does the work gets the benefit! Learning is personal!!!*
- **Don't waste your time and money!**
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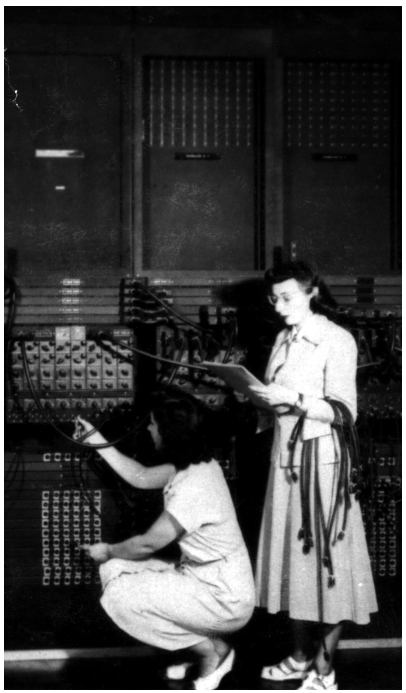

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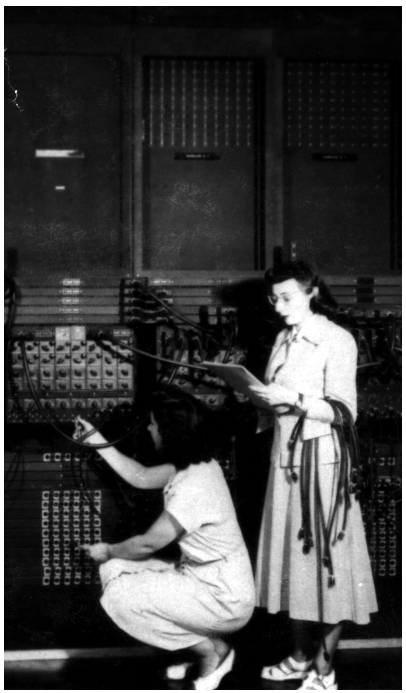

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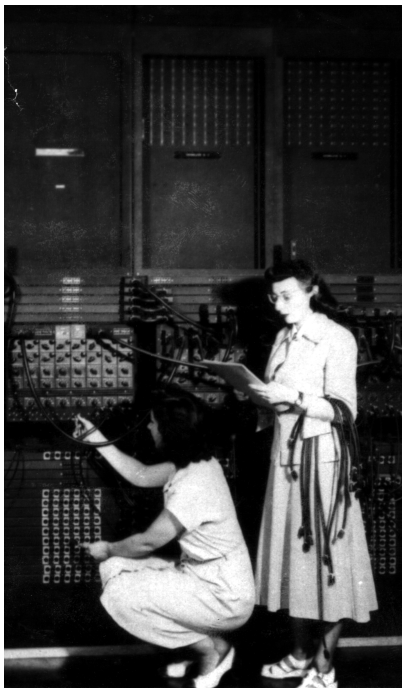
- **All instances of academic dishonesty will be reported to the office of Student Affairs**

Communication



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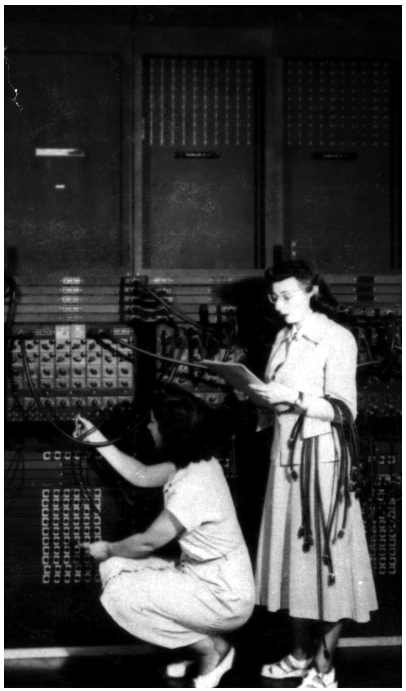

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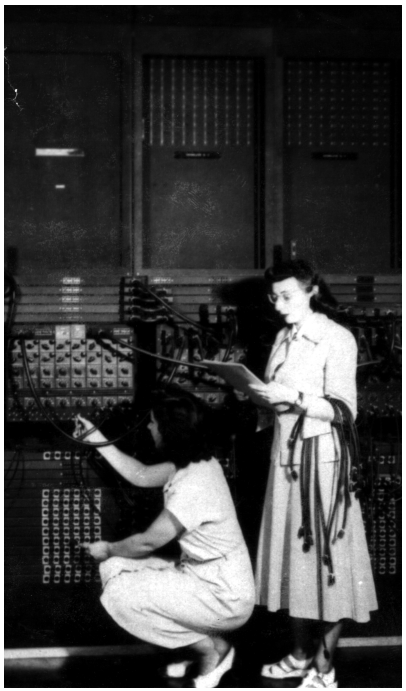

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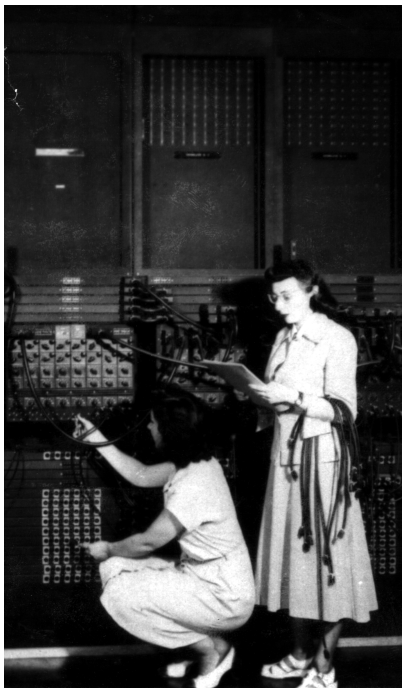

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- Email studenthelpdesk@hunter.cuny.edu if you need to change it

How to Succeed in this Course

Each Week:

- Come to Lecture

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- Ask for help from our UTAs in Drop-in Tutoring or Discussion Board.

Philosophy (Or Why We Do What We Do)

Please see our Q&A on Blackboard

- Topics

Philosophy (Or Why We Do What We Do)

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- Topics
  - Grading

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- We will keep adding to it throughout the semester, look out for new content

Today's Topics

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

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- 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).

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!

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#Name:  Thomas Hunter                          ← These lines are comments
#Date:  September 1, 2017                      ← (for us, not computer to read)
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print("Hello, World!")                         ← Prints the string "Hello, World!" to the screen
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- Output to the screen is: `Hello, World!`
- We know that `Hello, World!` is a **string** (a sequence of characters) because it is surrounded by quotes
- 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,')
```

Spring18 here in Assembly Hall
Who is L-M Miranda?

Variations on Hello, World!

```
#Name:  L-M Miranda
#Date:  Hunter College HS '98
#This program prints intro lyrics

print('Get your education,')
print("don't forget from whence you came, and")
print("The world's gonna know your name.")
```

- 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.

Today's Topics

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

Turtles Introduction

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- (Fancier turtle demo)

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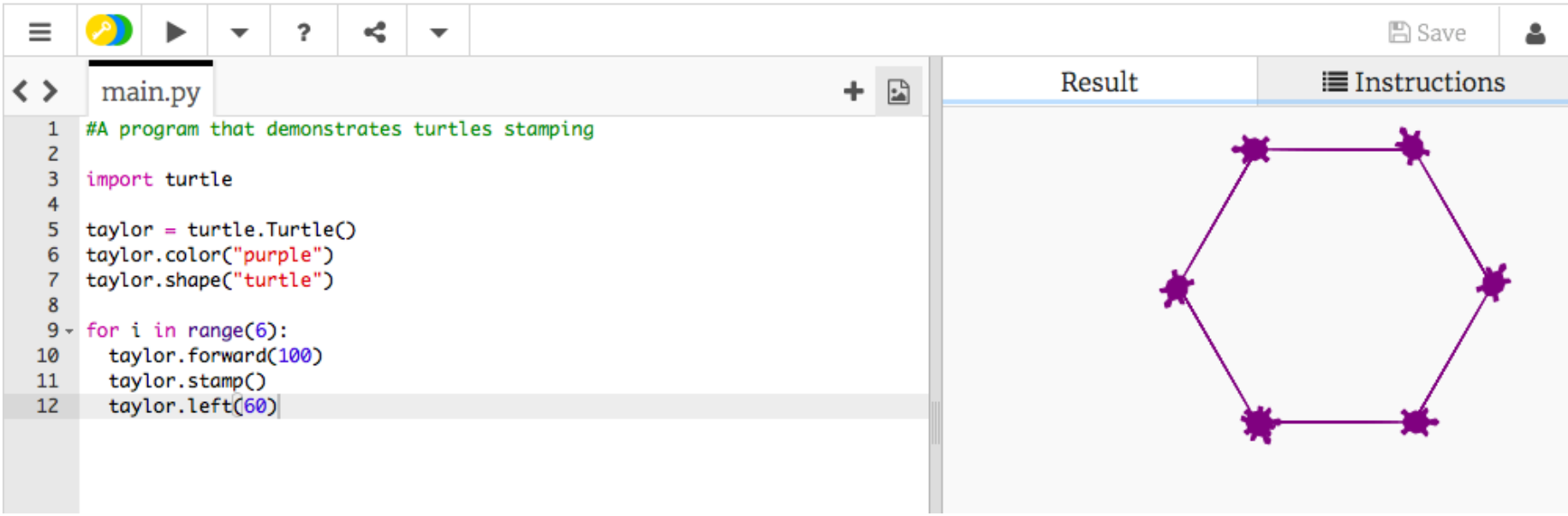
Turtles Introduction



- Creates a turtle **variable**, called `taylor`.

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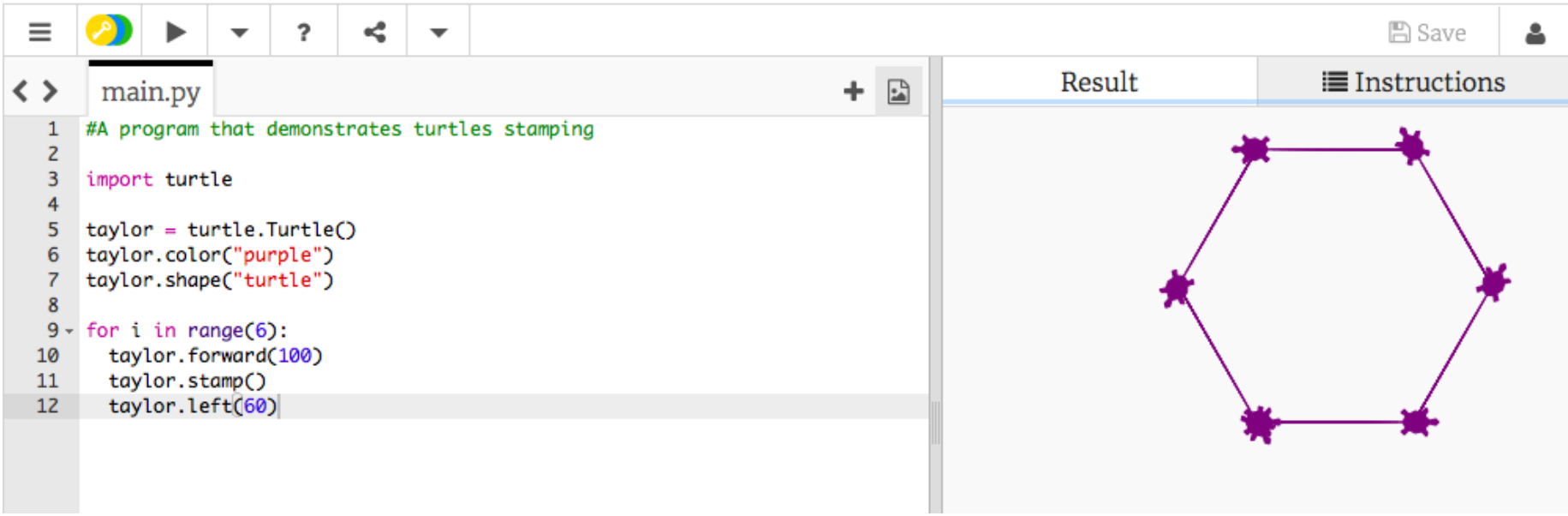

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- Changes the color (to purple) and shape (to turtle-shaped).

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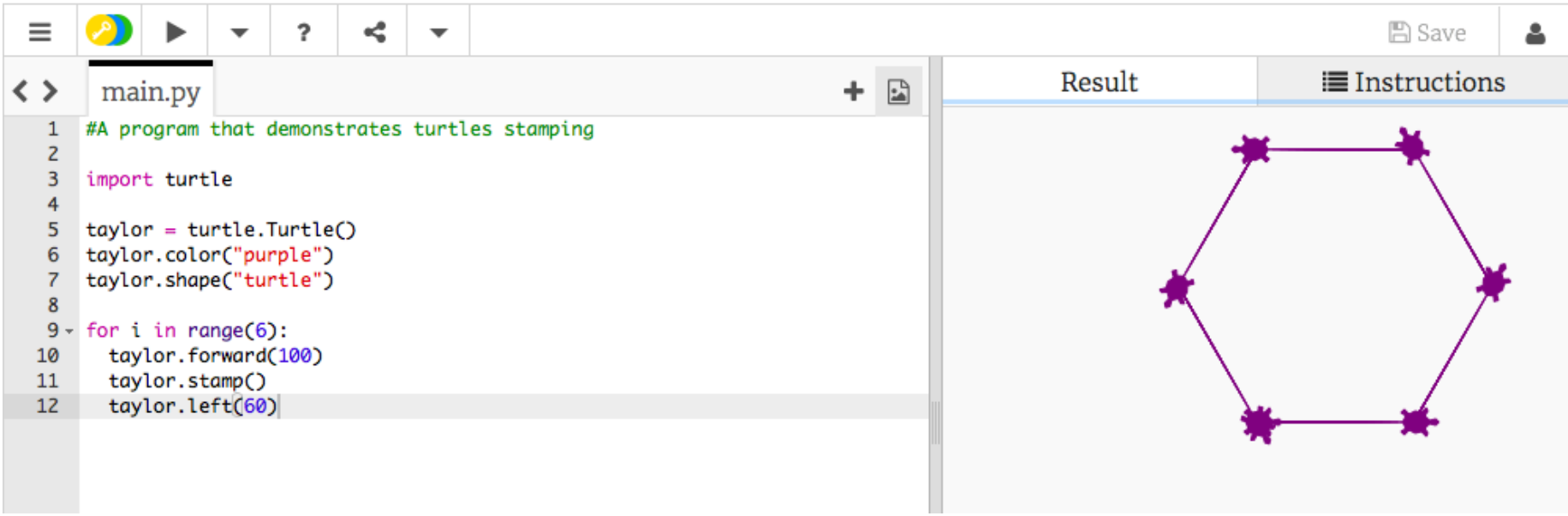

- Creates a turtle **variable**, called `taylor`.
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- Repeats 6 times:

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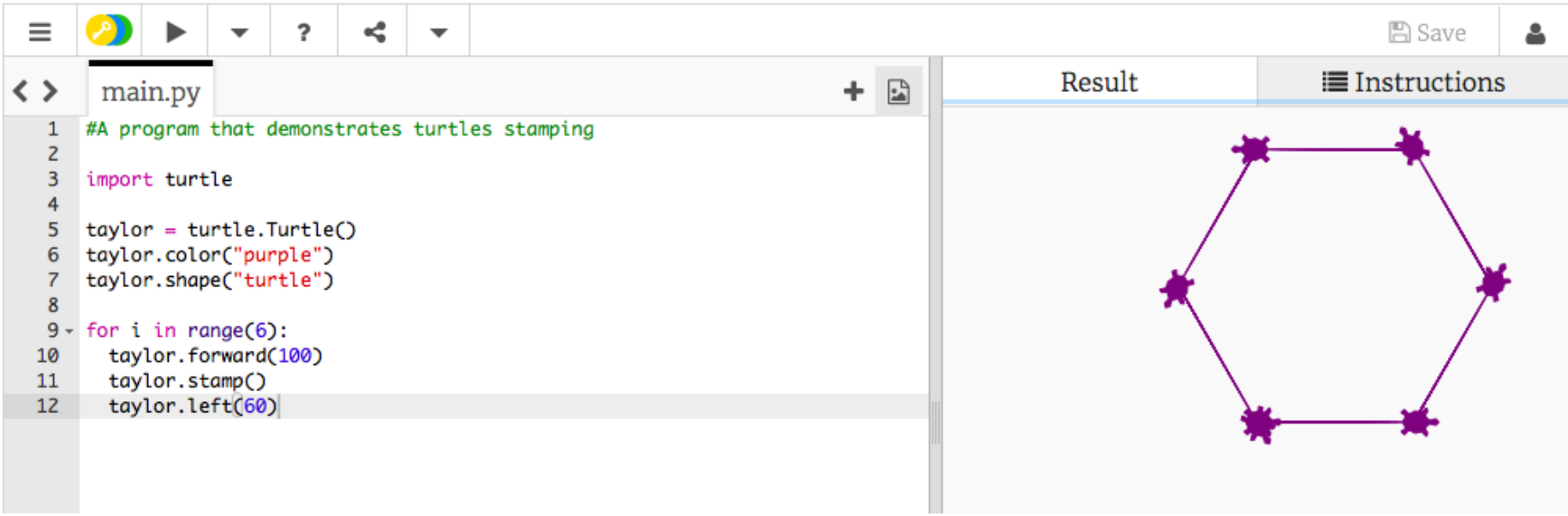

- Creates a turtle **variable**, called `taylor`.
- Changes the color (to purple) and shape (to turtle-shaped).
- Repeats 6 times:
  - Move forward; stamp; and turn left 60 degrees.

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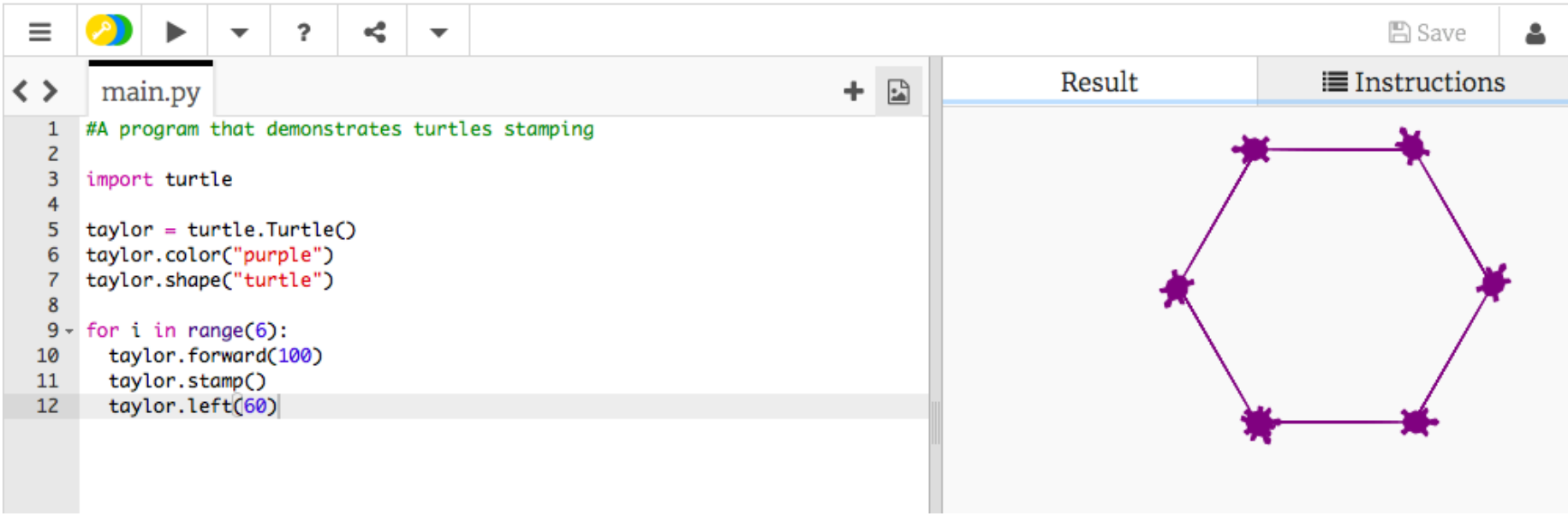

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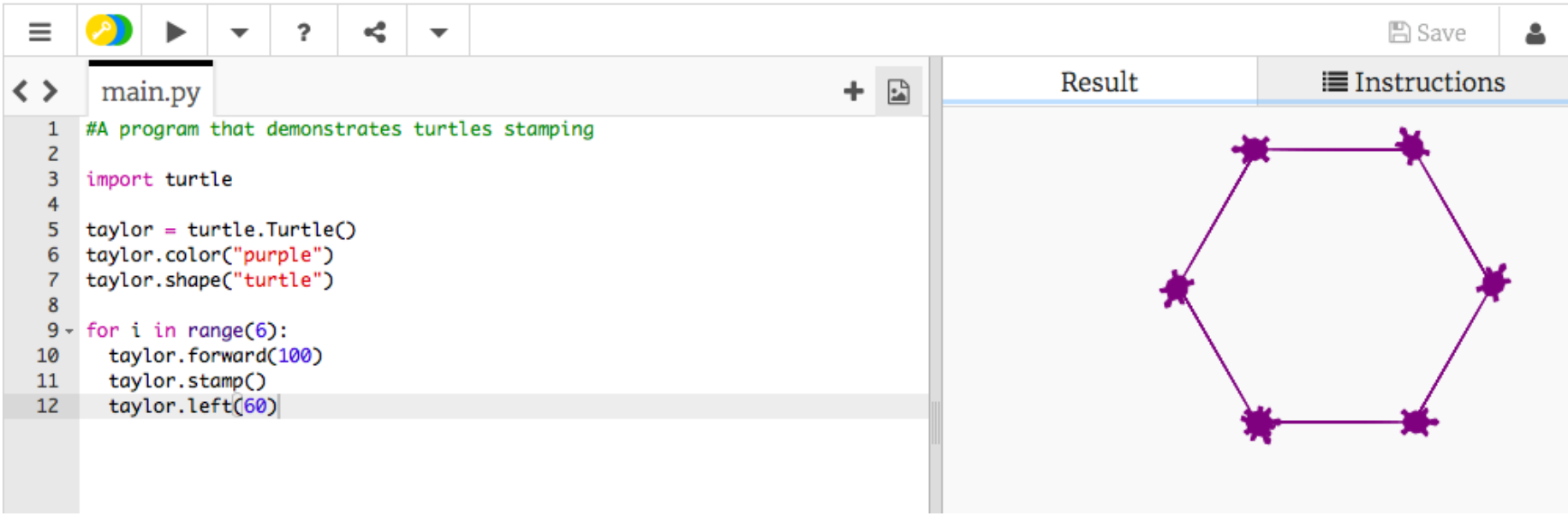

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  - Move forward; stamp; and turn left 60 degrees.
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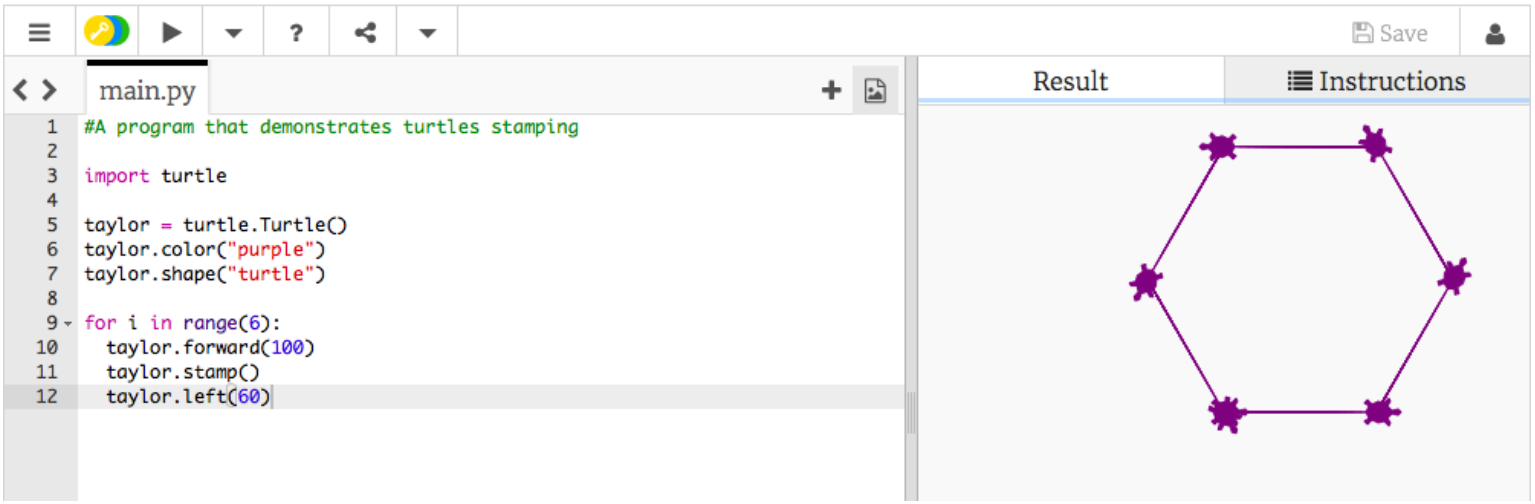
- This is a **definite** loop because it repeats a fixed number of times

Your Turn!!!

Try to solve this challenge:

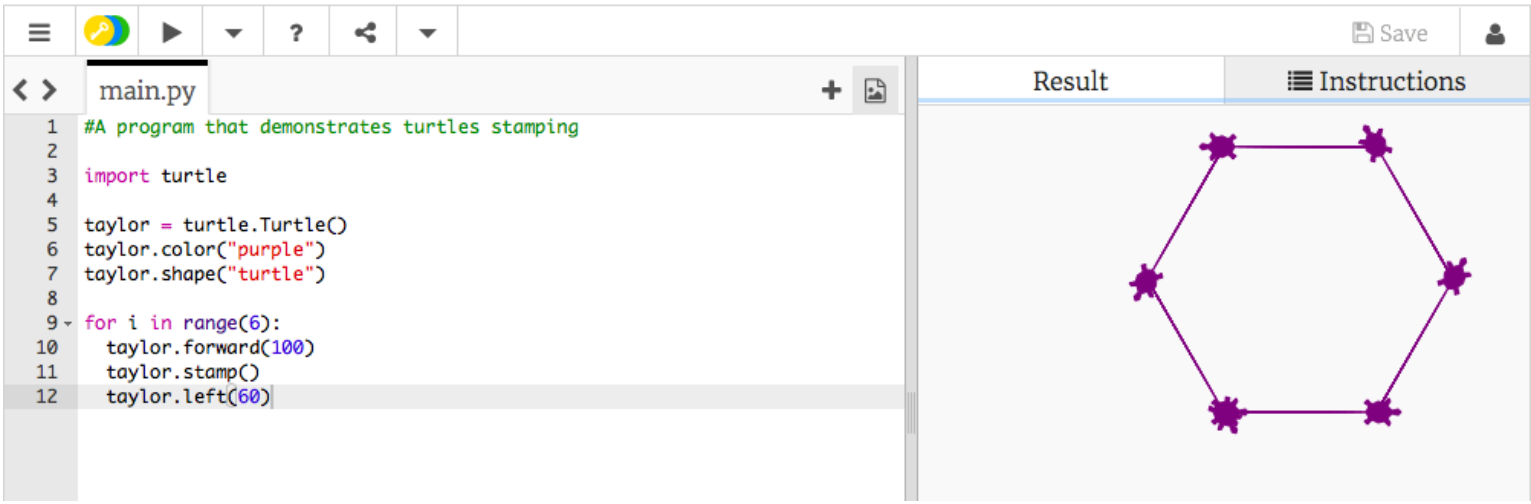
1. Write a program that will draw a 10-sided polygon.
2. Write a program that will repeat the line:
   `I'm lookin' for a mind at work!`
   three times.

Decagon Program



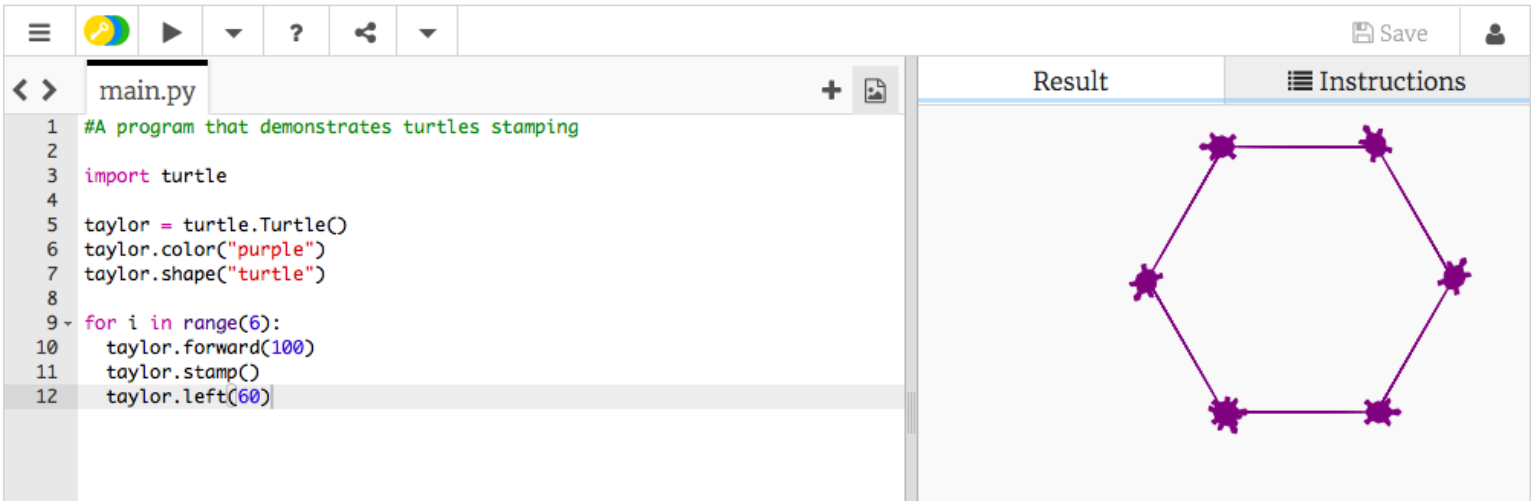
- Start with the hexagon program.

Decagon Program



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

Decagon Program



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

- 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!")
```

Lecture Quiz

Log-in to Gradescope

- Find Lecture 1 Quiz

Lecture Quiz

Log-in to Gradescope

- Find Lecture 1 Quiz
- Take the quiz

Lecture Quiz

Log-in to Gradescope

- Find Lecture 1 Quiz
- Take the quiz
- You have 3 minutes

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What is an Algorithm?

From our textbook:

- An algorithm is a process or sequence of steps to be followed to solve a problem.

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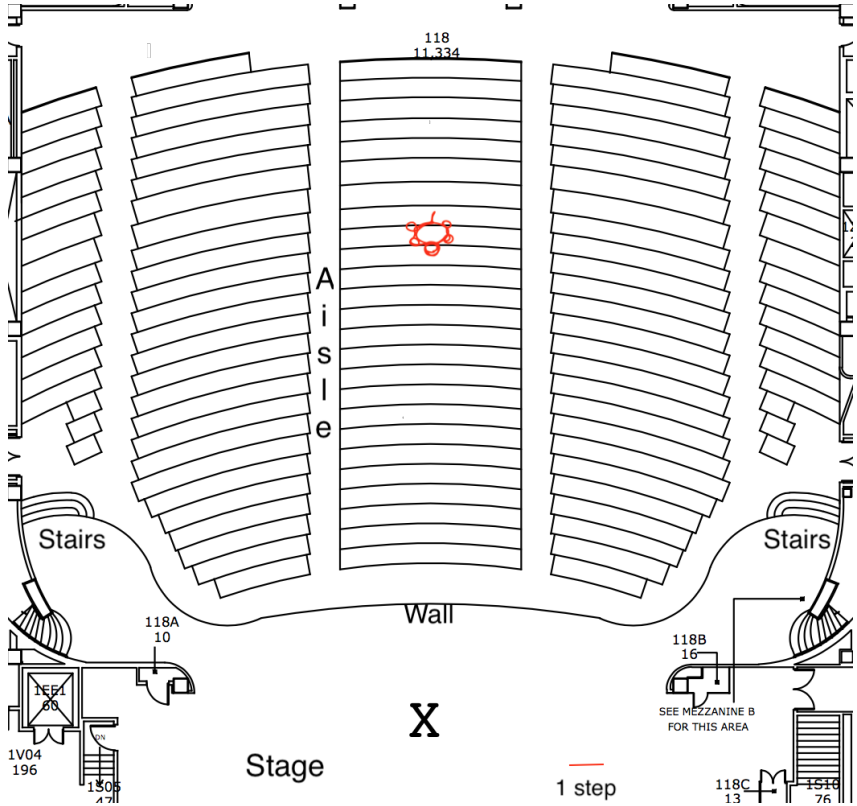
- Programming is a skill that allows a computer scientist to take an algorithm and represent it in a notation (a program) that can be executed by a computer.

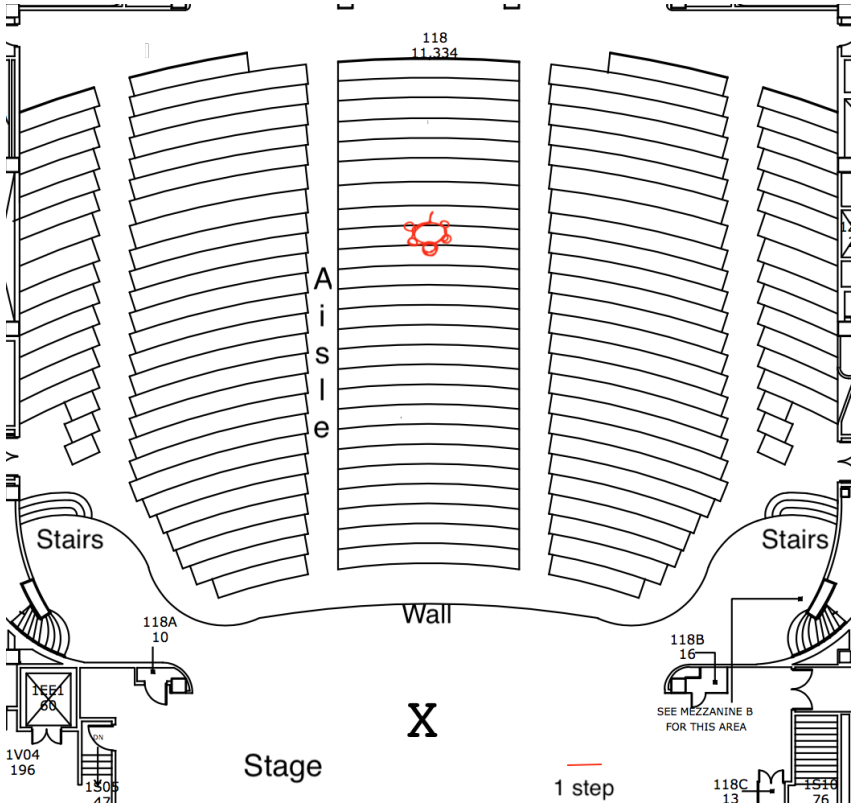
Your Turn!!!



Try to solve this challenge:

1. This is the floor plan of Assembly Hall at Hunter College.

Your Turn!!!



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1. This is the floor plan of Assembly Hall at Hunter College.
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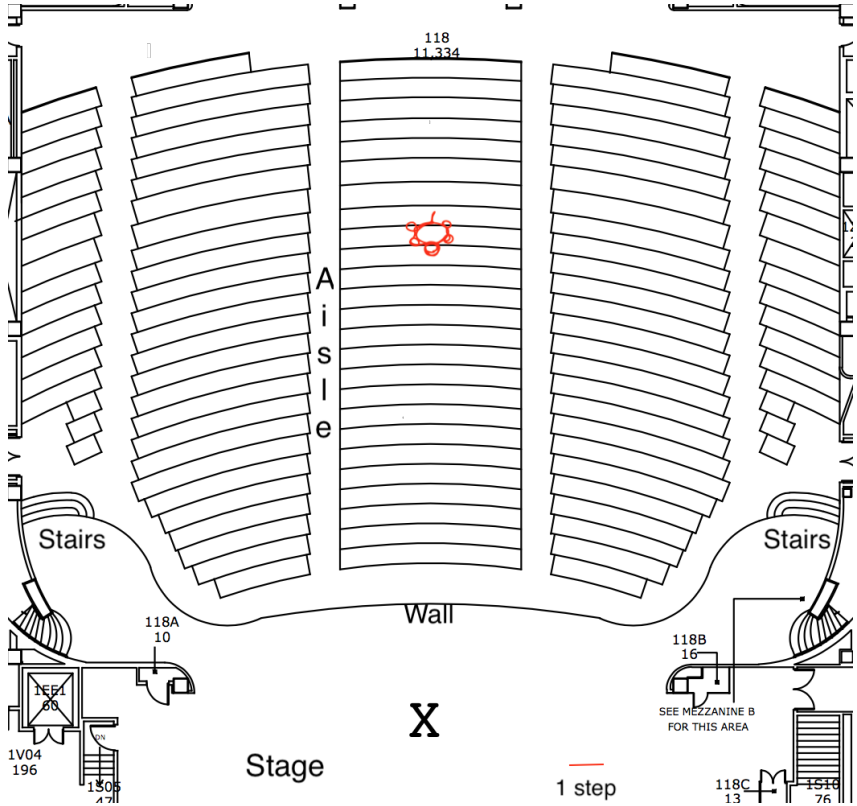

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3. Basic Rules:

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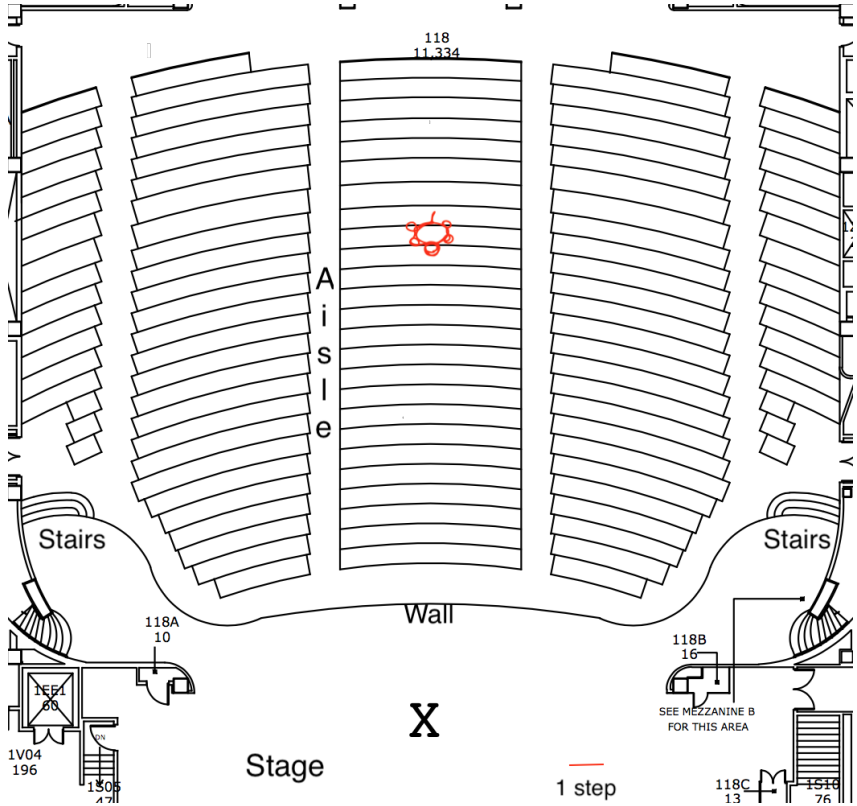

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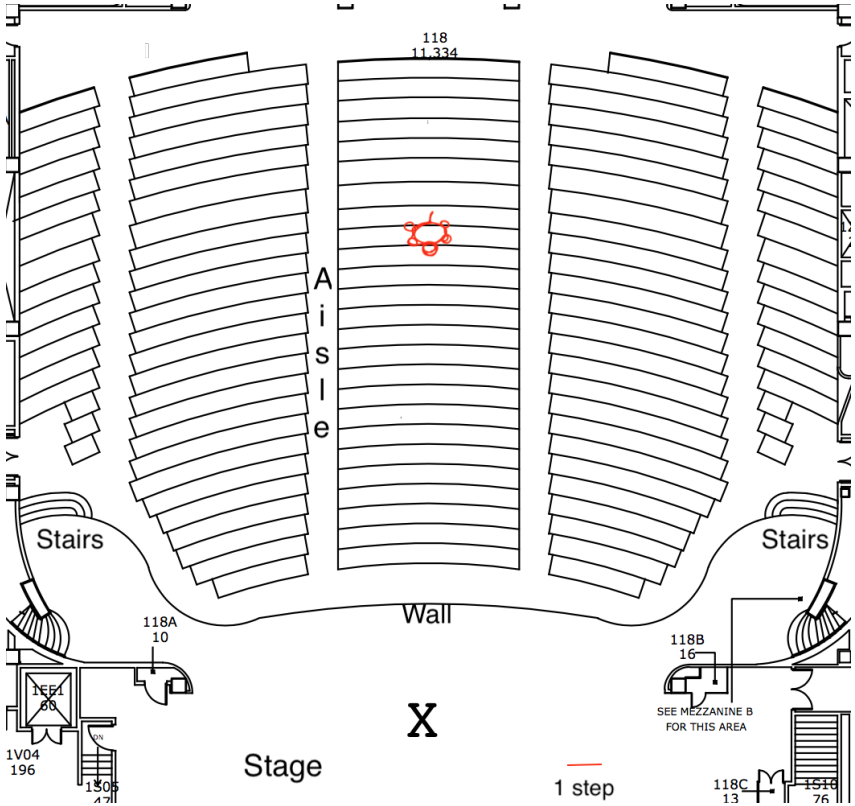

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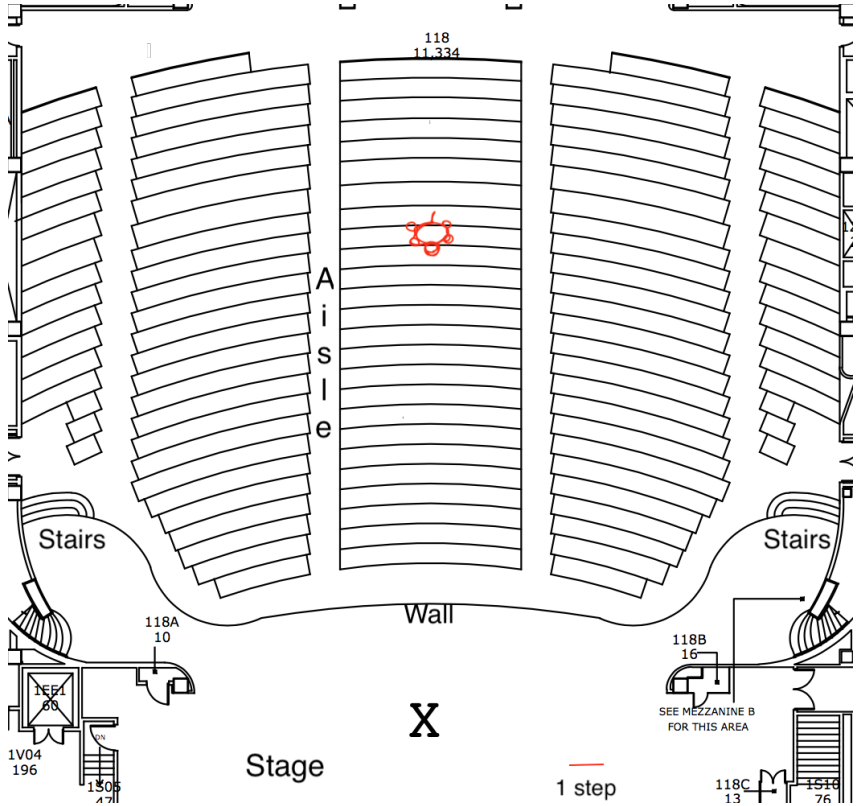

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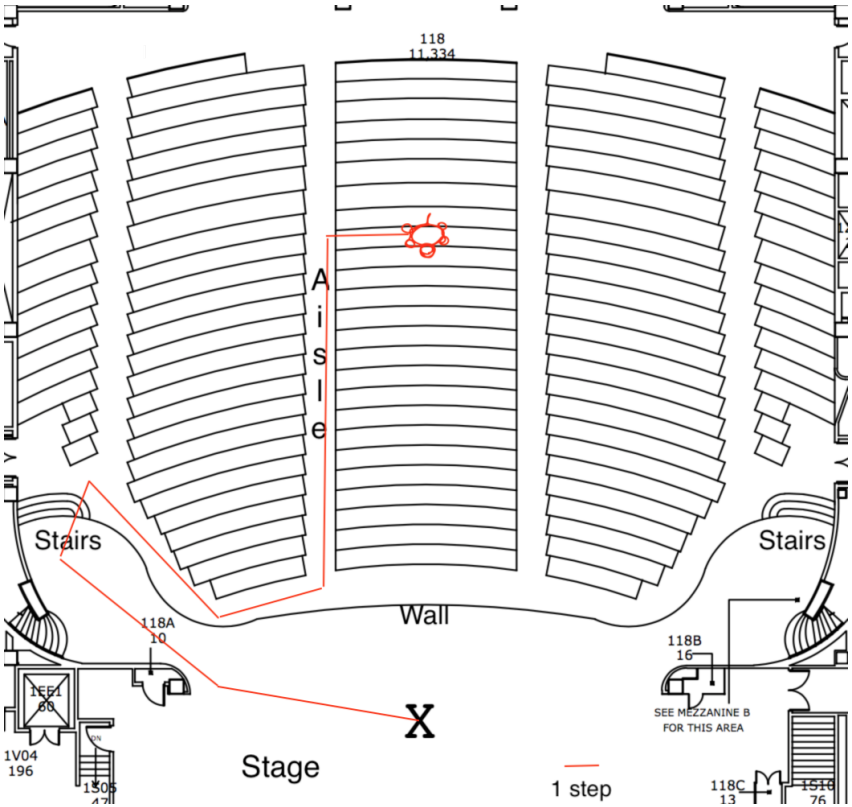
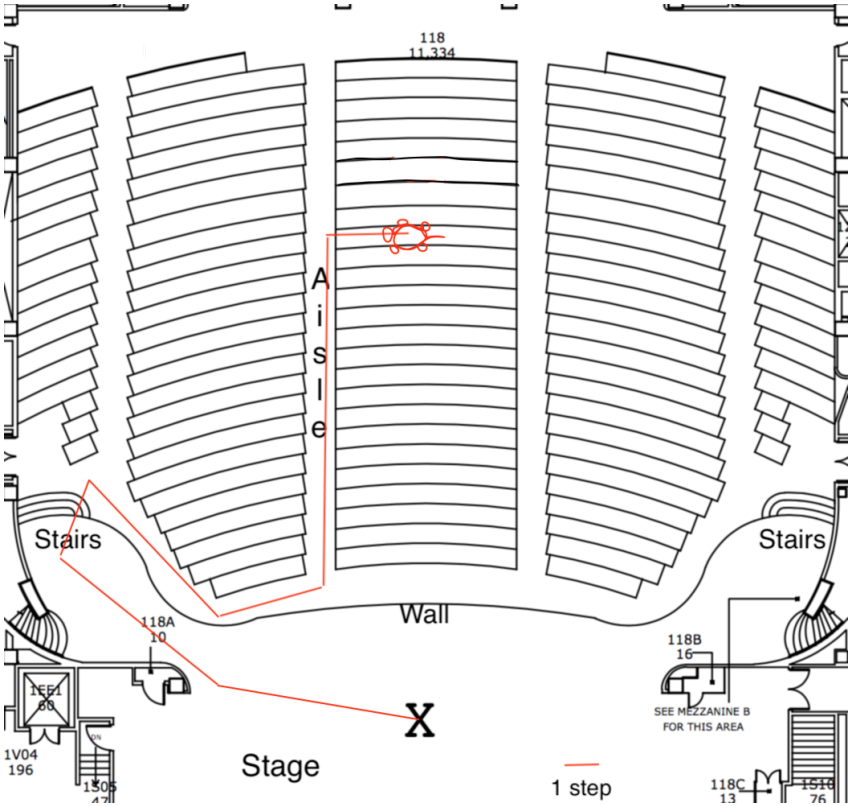
   - Turtles cannot climb walls, must use stairs (walk forward on steps).

Your Turn!!!



One possible solution:

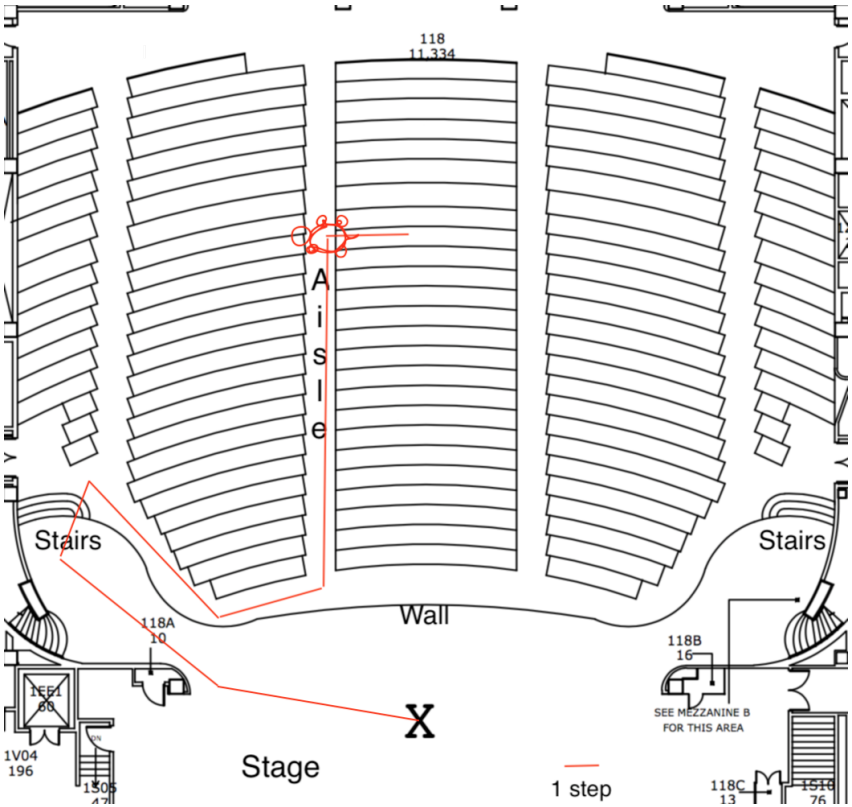
Your Turn!!!



One possible solution:

- Turn right 90 degrees.

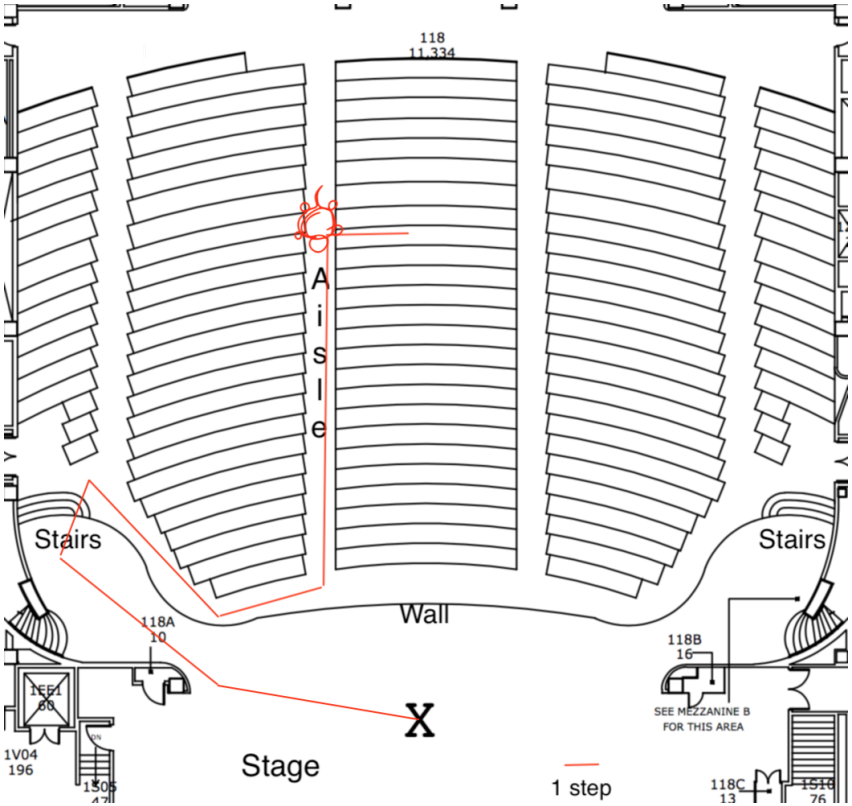
Your Turn!!!



- Turn right 90 degrees.
- Walk forward 3 steps.

One possible solution:

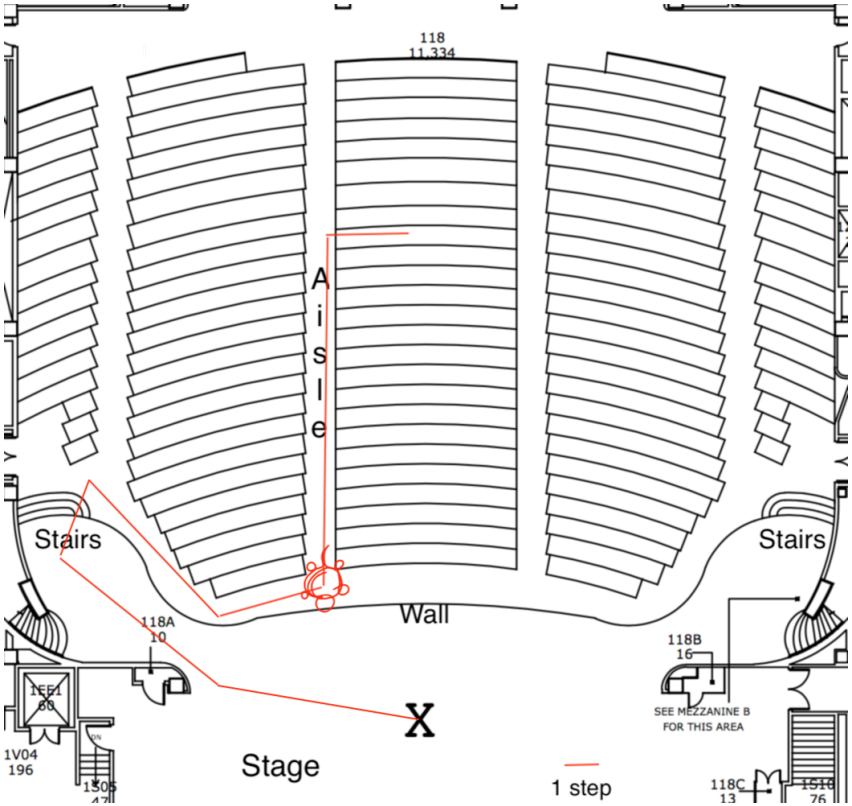
Your Turn!!!



One possible solution:

- Turn right 90 degrees.
- Walk forward 3 steps.
- Turn left 90 degrees.

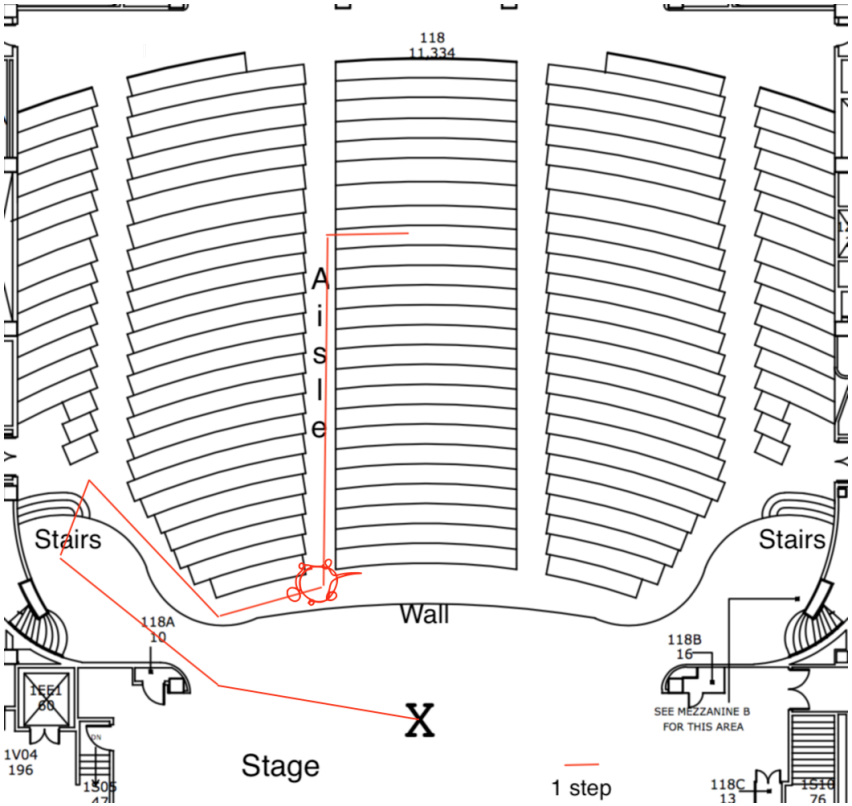
Your Turn!!!



- Turn right 90 degrees.
- Walk forward 3 steps.
- Turn left 90 degrees.
- Walk forward 10 steps.

One possible solution:

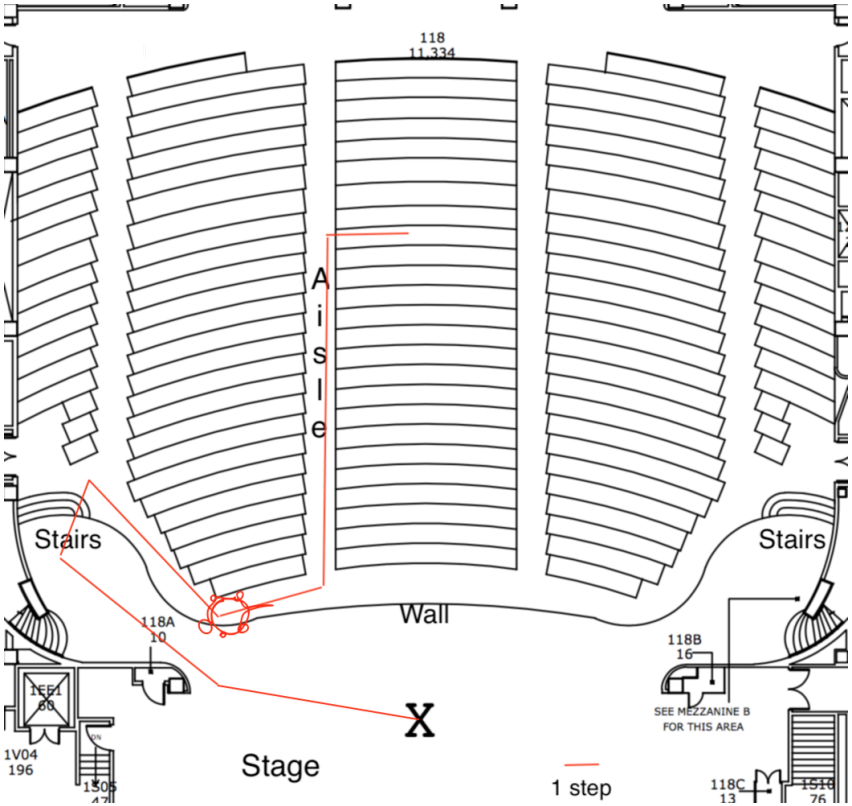
Your Turn!!!



One possible solution:

- Turn right 90 degrees.
- Walk forward 3 steps.
- Turn left 90 degrees.
- Walk forward 10 steps.
- Turn right 65 degrees

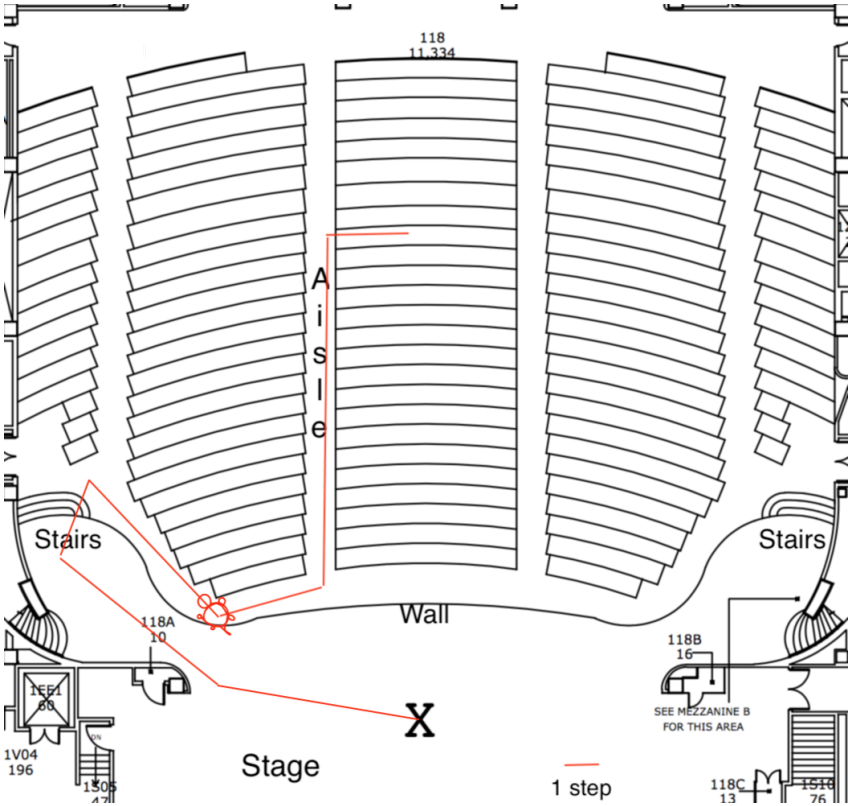
Your Turn!!!



One possible solution:

- Turn right 90 degrees.
- Walk forward 3 steps.
- Turn left 90 degrees.
- Walk forward 10 steps.
- Turn right 65 degrees.
- Walk forward 4 steps.

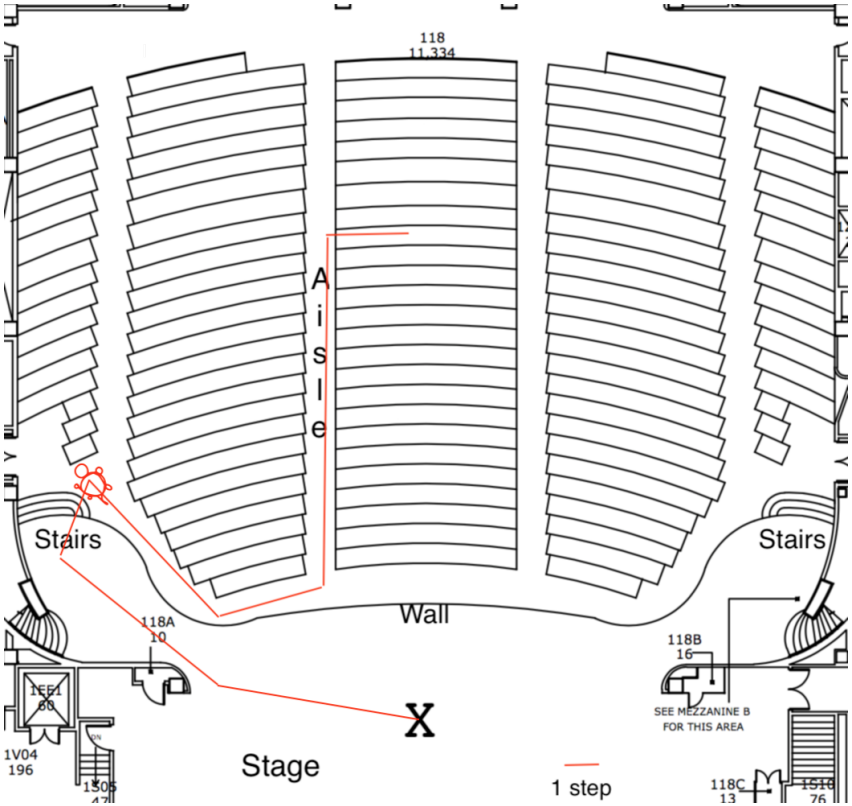
Your Turn!!!



- Turn right 90 degrees.
- Walk forward 3 steps.
- Turn left 90 degrees.
- Walk forward 10 steps.
- Turn right 65 degrees.
- Walk forward 4 steps.
- Turn right 45 degrees.

One possible solution:

Your Turn!!!



- Turn right 90 degrees.
- Walk forward 3 steps.
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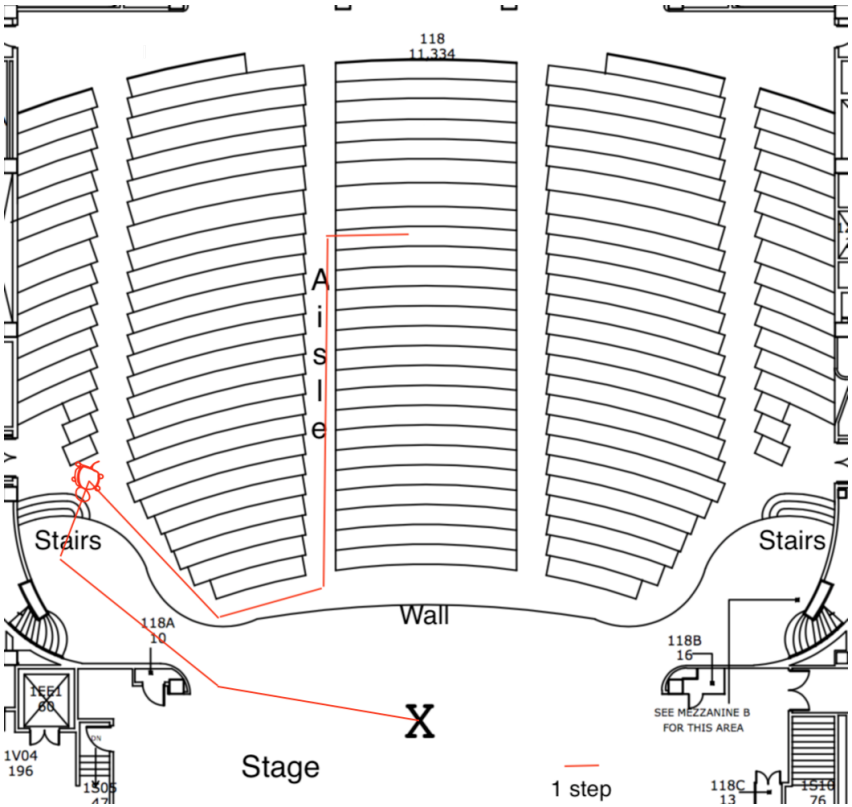
- Turn right 45 degrees.
- Walk forward 6 steps.

One possible solution:

Your Turn!!!



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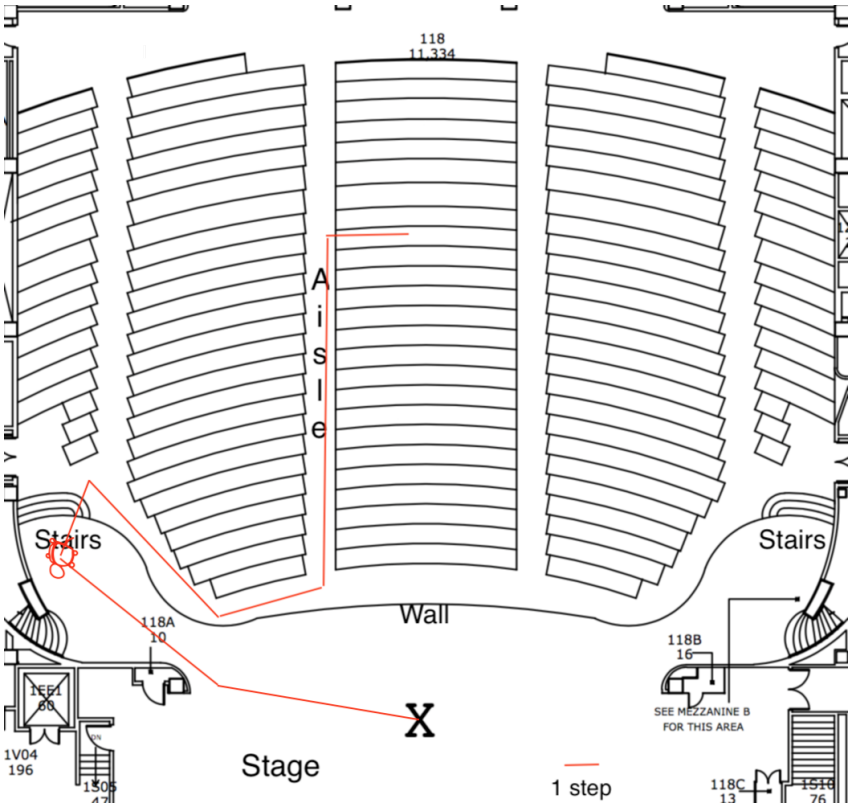
- Turn left 110 degrees.

Your Turn!!!



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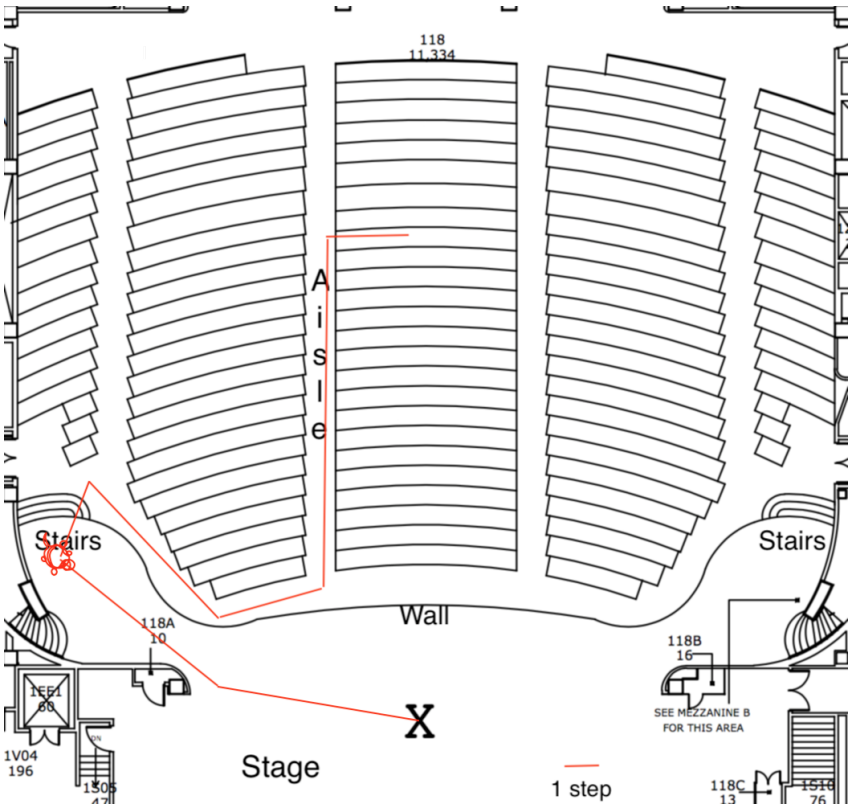
- Walk forward 6 steps.
- Turn left 110 degrees.
- Walk forward 3 steps.

Your Turn!!!



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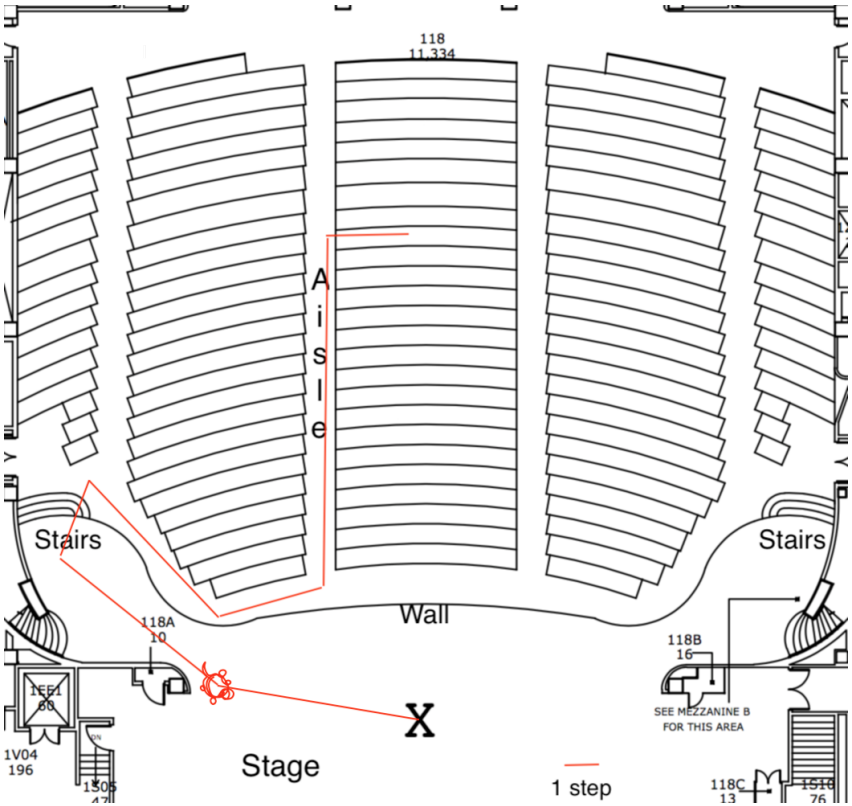
- Turn right 45 degrees.
- Walk forward 6 steps.
- Turn left 110 degrees.
- Walk forward 3 steps.
- Turn left 80 degrees.

Your Turn!!!



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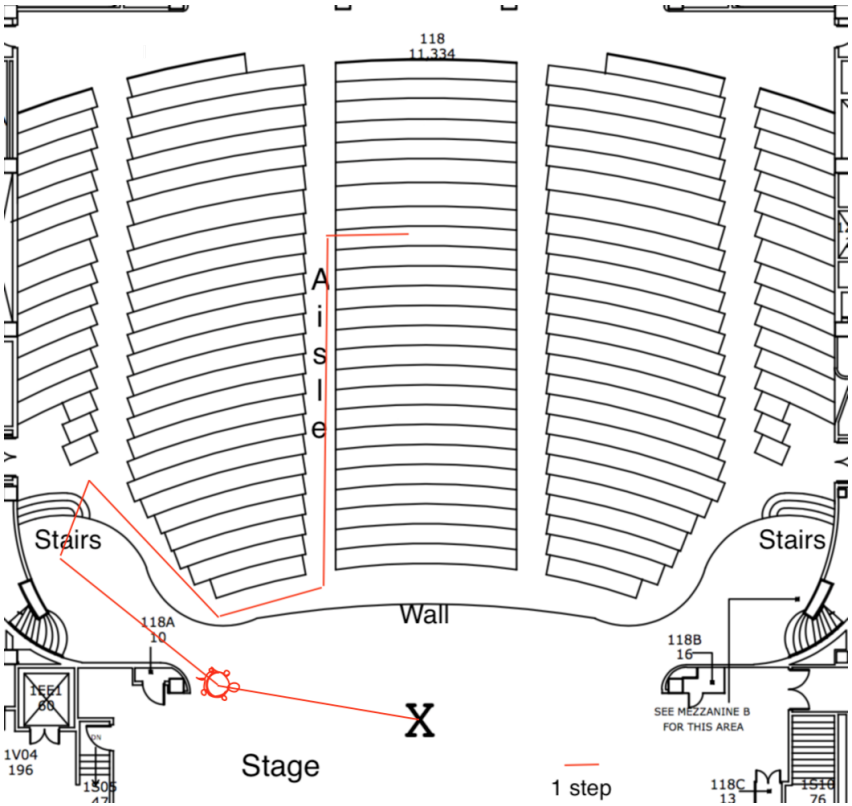

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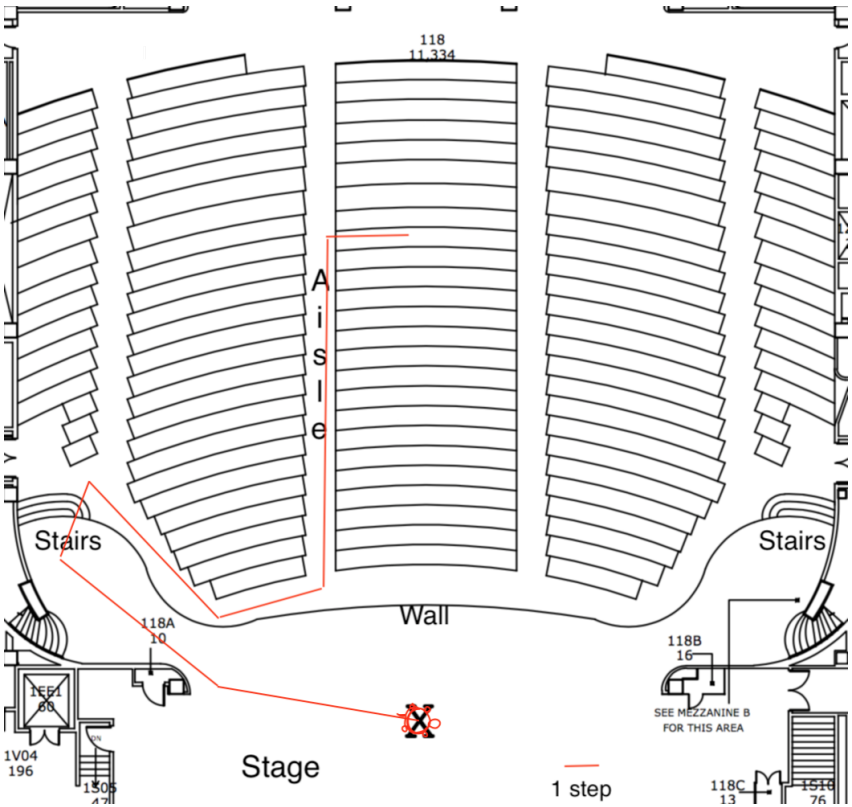
- Walk forward 5 steps.
- Turn left 30 degrees.

Your Turn!!!



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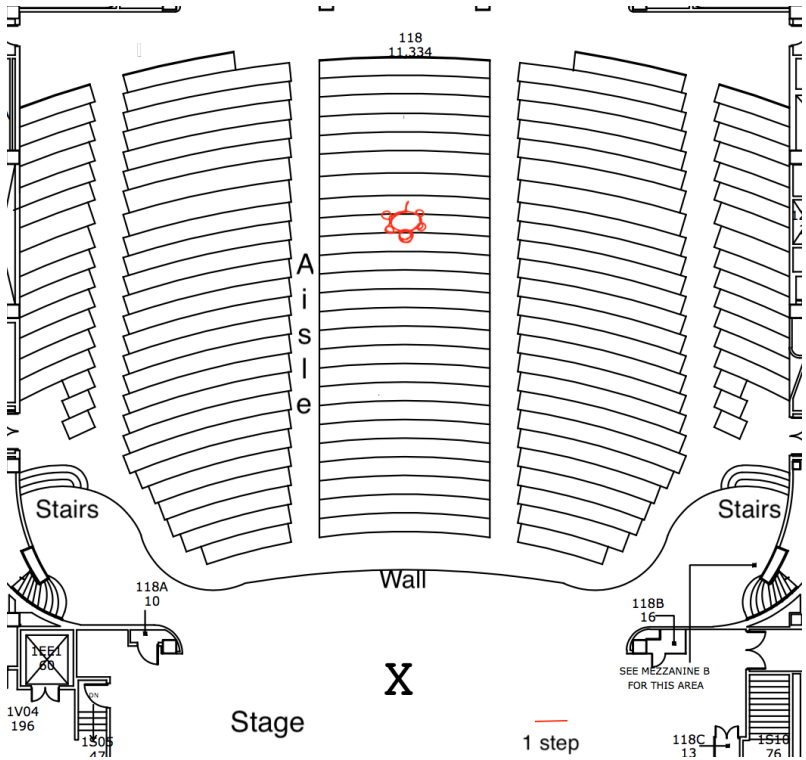
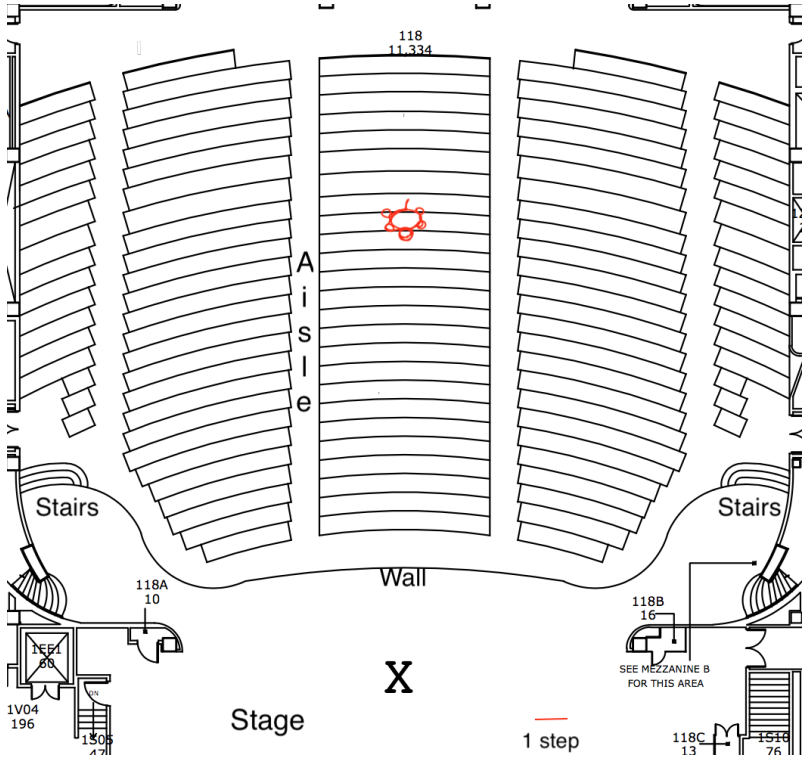
- Turn left 30 degrees.
- Walk forward 6 steps. Reached X!!!

Your Turn!!!



- For fun, post your algorithm on the "Turtle on Stage" forum in the Discussion Board on Blackboard

Your Turn!!!



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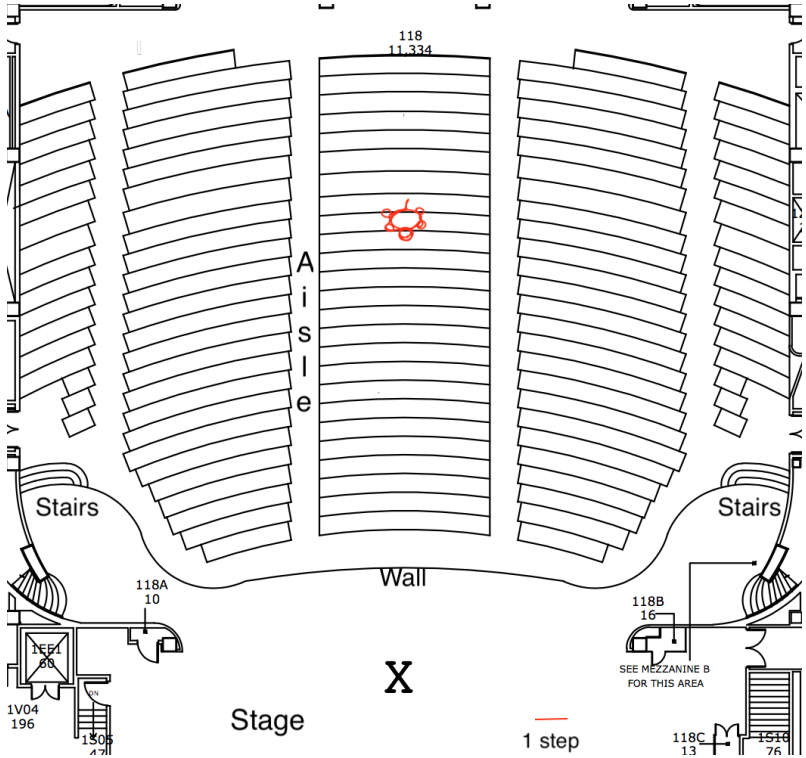

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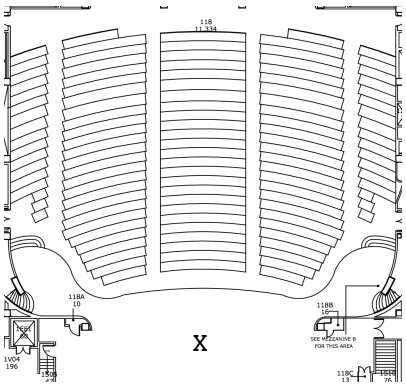
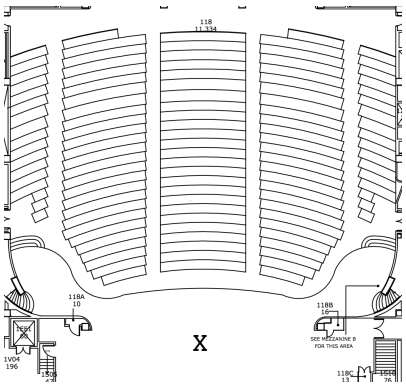
- Degrees the turtle turns are approximate, any good approximation is considered correct.

Recap



- Writing precise algorithms is difficult.

Recap



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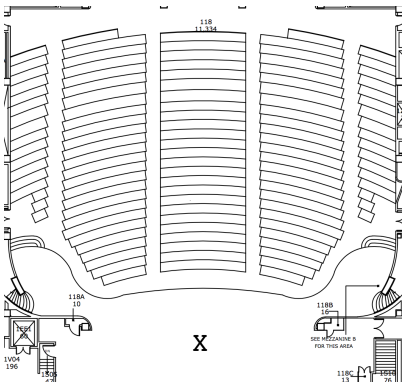

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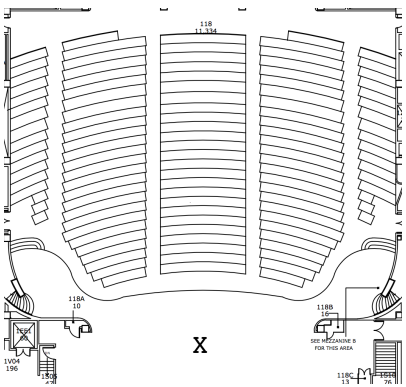

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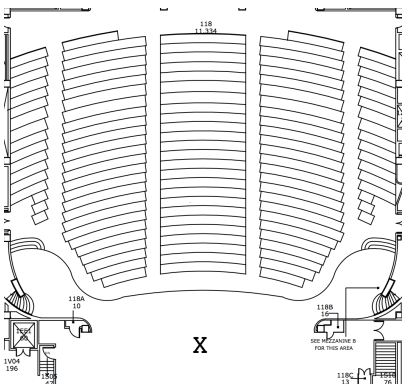

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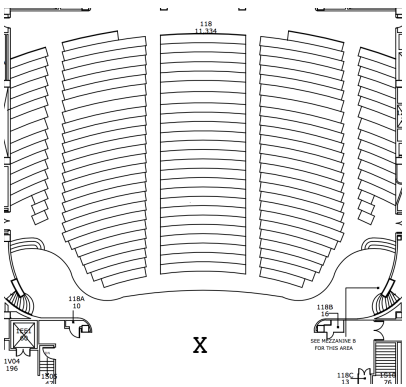

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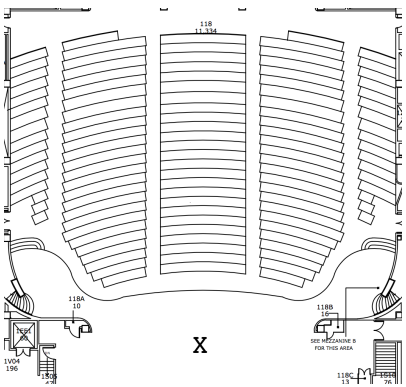

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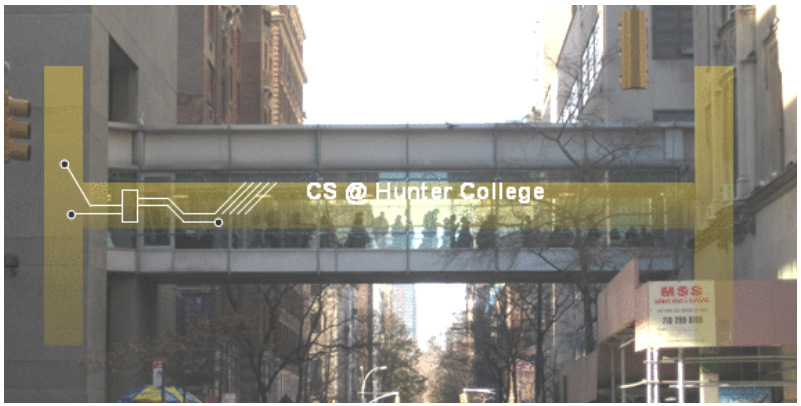
Weekly Reminders!



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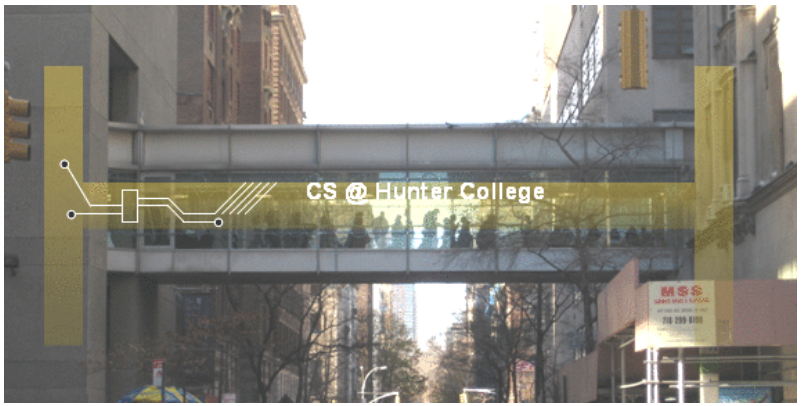

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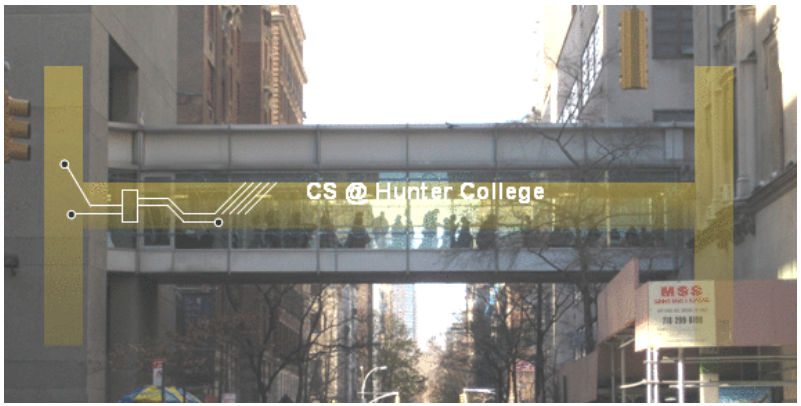

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