Welcome to CS 61A!

Lecture will begin at 2:10pm.

(Until then, you just get to watch us type.)

Looking for something to do?
Try reading the "Syllabus" link at the top of cs61a.org

Questions?
There is an Ed thread for this lecture

Welcome to CS 61A

Your Instructors

John DeNero
denero@berkeley.edu

Hany Farid
hfarid@berkeley.edu

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CS 61A instructor many times

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- TBD

61A Course Staff

https://cs61a.org/TAs/ https://cs61a.org/tutors/ (coming soon)

About the Course

Parts of the Course

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Friday: Finish projects you didn't finish on Thursday

Asking Questions

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Ed: All staff (private posts) and students (public posts)

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cs61a.org/contact/: Even more ways to reach the course staff

An Introduction to Computer Science

What is Computer Science?

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```
The study of
```

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- What problems can be solved using computation,
- How to solve those problems, and

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A course about managing complexity

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- Combining multiple ideas in large projects
- How computers interpret programming languages

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- Mastering abstraction

An introduction to programming

- Full understanding of Python fundamentals
- Combining multiple ideas in large projects
- How computers interpret programming languages
- Different kinds of programming languages

Should you take CS 61A?

According to the Syllabus

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```
There is no formal programming-related prerequisite for CS 61A, but...
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Students who take the course later often get more out of it due to increased understanding.

CS 10: The Beauty and Joy of Computing

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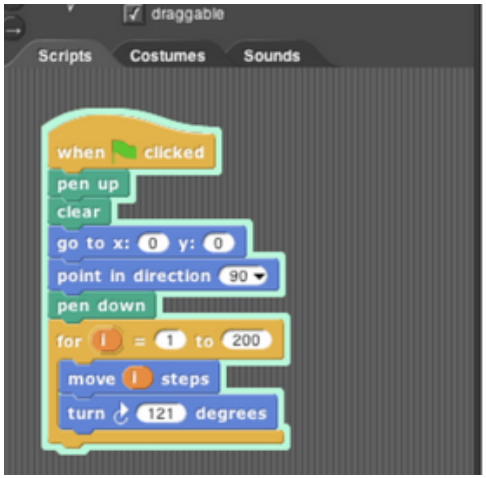

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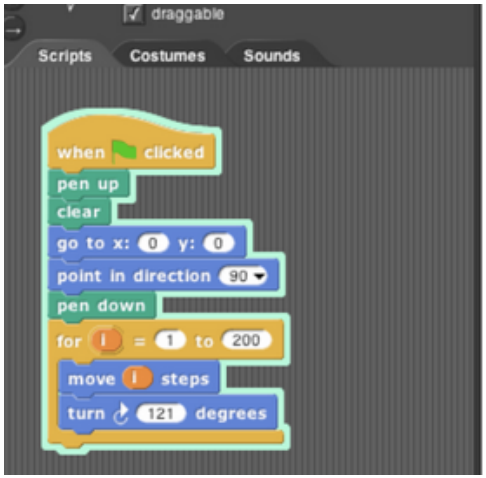

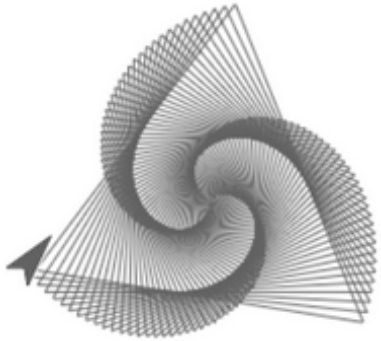

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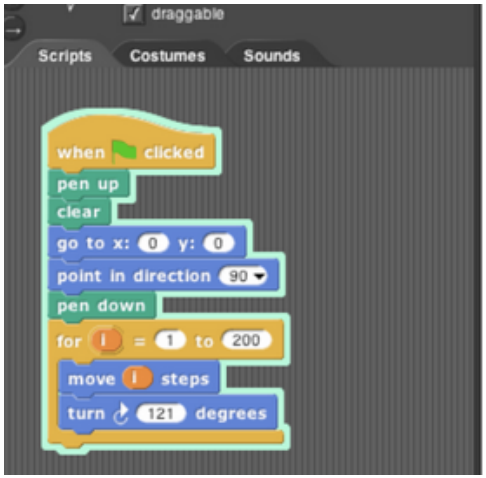

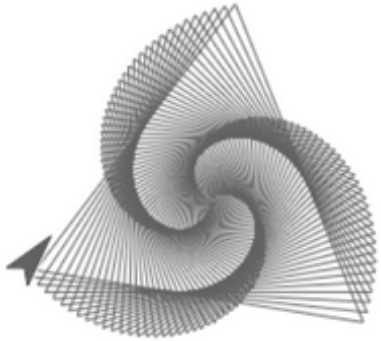

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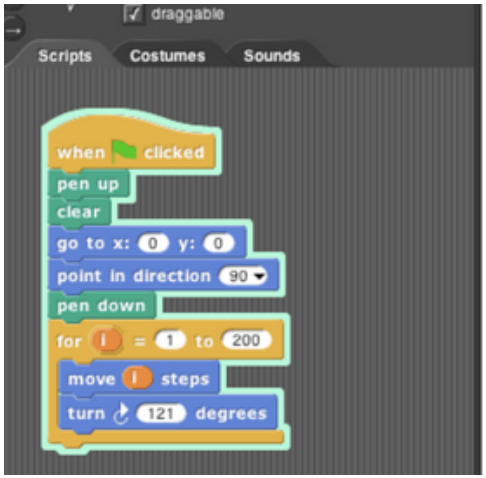

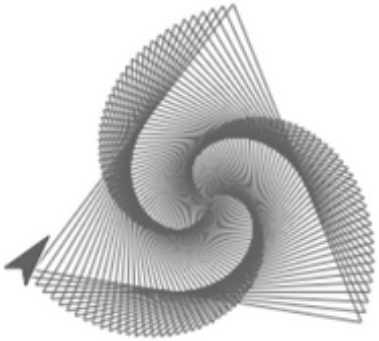

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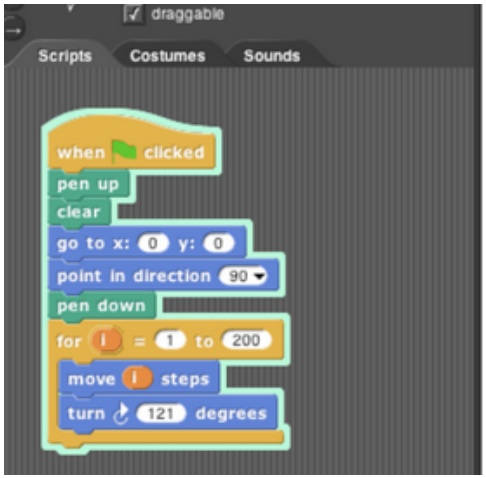

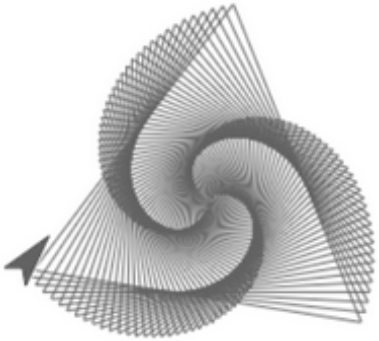

Data C88C (Formerly CS 88): Computational Structures in Data Science

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For students taking Data 8 (Foundations of Data Science) or who took it already

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We're investigating expansion options

Course Policies

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Learning

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Community

Learning

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Course Staff

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Details...

https://cs61a.org/articles/about/

Getting Help

If you're struggling, let us know.

If you need more time, ask for it.

If you need special accommodations, make an appointment.

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- *Please* don’t look at someone else's code!
  Exceptions: lab, your project partner, or **after you already solved the problem**

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every semester dozens of students fail this course because of cheating

cheating is disrespectful

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cheating destroys trust

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cheating is a trap

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cheating completely misses the point

it is just wrong

computer science is (much) more than coding


SIENNA LE


SIENNA
LE


SIENNA
LE


SIENNA


SIENNA

```python
# load some libraries
import cv2
import numpy as np
import matplotlib.pyplot as plt
import matplotlib.image as image
from PIL import Image
from numpy import linalg as la
```

```python
# load and display image
im = image.imread('license.png')
plt.imshow(im)
plt.axis('off')
plt.show()
```

abstraction

```python
# specify world coordinates of rectangular license plate
X = np.array([100, 400, 400, 100])
Y = np.array([100, 100, 200, 200])

# specify image coordinates of distorted license plate
u = np.array([129.6, 169.5, 183.7, 142.9]);
v = np.array([216.5, 218.9, 86.4, 91.1]);

# display image with image coordinates
im = image.imread('license.png')
plt.scatter( u, v, s=100, facecolors='none', edgecolors='y')
plt.imshow(im)
plt.axis('off')
plt.show()
```

data structures

data visualization

function + form

```python
# estimate homography
A = np.zeros((8,9))
for i in range(0,4):
    A[2*i,:]   = [0, 0, 0, -X[i], -Y[i], -1, v[i]*X[i], v[i]*Y[i], v[i] ]
    A[2*i+1,:] = [X[i], Y[i], 1, 0, 0, 0, -u[i]*X[i], -u[i]*Y[i], -u[i] ]

At   = A.transpose()
L,V  = la.eig( At@A )
h    = V[:,-1] # minimial eigenvalue eigenvector (assumes that eigenvalues
H    = np.reshape(h,(3,3))
H    = la.inv(H)

# warp source image based on homography
im_warp = cv2.warpPerspective(im, H, (2*im.shape[1],im.shape[0]))

# display rectified image
plt.imshow(im_warp)
plt.gca().invert_yaxis()
plt.axis('off')
plt.show()
```

math

numerical methods

solving problems

ethical computing

Course Climate

Let's Stop Harassment & Discrimination

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- CS61A Anonymous feedback form: If you want to stay anonymous but make us aware of something happening in the course.

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Disparaging remarks targeting a particular gender, race, or ethnicity are not acceptable.

From the Berkeley Principles of Community:

> "We affirm the dignity of all individuals and strive to uphold a just community in which discrimination and hate are not tolerated."

From the EECS department mission:

> "Diversity, equity, and inclusion are core values in the Department of Electrical Engineering and Computer Sciences. Our excellence can only be fully realized by faculty, students, and staff who share our commitment to these values."

All faculty and staff members are *mandated reporters*. If we ever receive a report of harassment, we must report to the Office for the Prevention of Harassment & Discrimination.

- CS61A Anonymous feedback form: If you want to stay anonymous but make us aware of something happening in the course.
- EECS Student Climate & Incident Reporting Form: Informs the EECS department of any issues. You can also contact Susanne Kauer (skauer@berkeley.edu) directly.

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Programming

(Demo)