

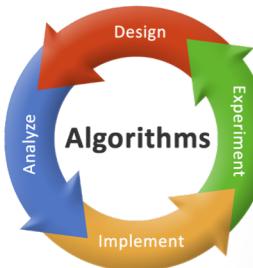
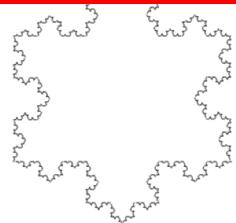
Turtle Graphics



# Welcome to CS 8!

Introduction to Computer Science!

Enrollment: 113/105



# Instructor

- Diba Mirza ([dimirza@cs.ucsb.edu](mailto:dimirza@cs.ucsb.edu))
  - Faculty, Computer Science
  - PhD (Computer Engineering, UCSD)
- Office: HFH 1155
- Best way to reach me:
  - Piazza, Office Hours
  - Include [CS8] in the subject line of an emails
  - Office hours
    - Thursdays 3:30pm – 5:00pm,
    - Fridays 2pm – 3pm, Or by appointment



# Course staff



Anacaren



Mohith



Taylor



Jared



Madhu

Schedule for all lab  
and office hours:

[https://ucsb-cs8.github.io/w19-mirza/info/lab\\_office\\_hours/](https://ucsb-cs8.github.io/w19-mirza/info/lab_office_hours/)

# About you ...

What is your major?

- A. Computer Science or Computer Engineering
- B. Engineering (Chemical, Mechanical, Electrical...)
- C. Math, Stats or Actuarial Science
- D. Other

# About you ...

What is your familiarity/confidence with programming in Python?

- A. Know nothing or almost nothing about it.
- B. Used it a little, beginner level.
- C. Some expertise, lots of gaps though.
- D. Lots of expertise, a few gaps.
- E. Know too much; I have no life.

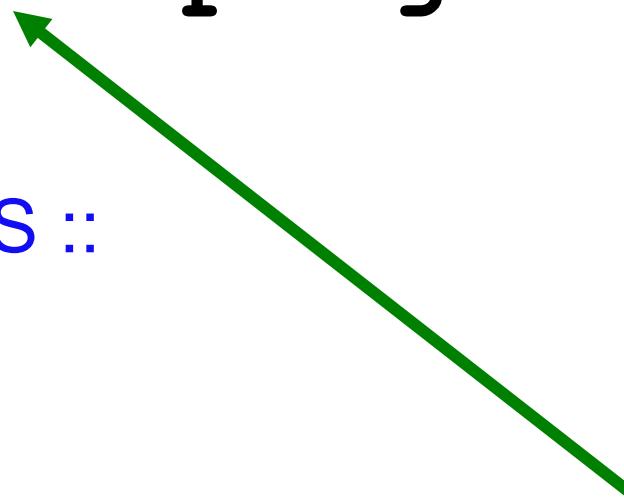
# This course: Intro to CS!

What does the term Computer Science mean to you?

**CS      !=      programming**

**programming : CS ::**

**"not equal to"**



**CS     !=     programming**

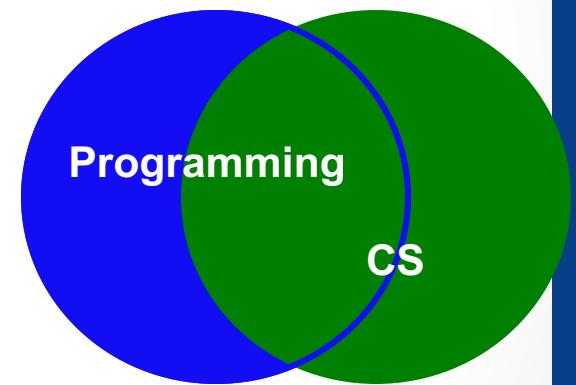
programming : CS ::

surfing : Santa Barbara

machining : engineering

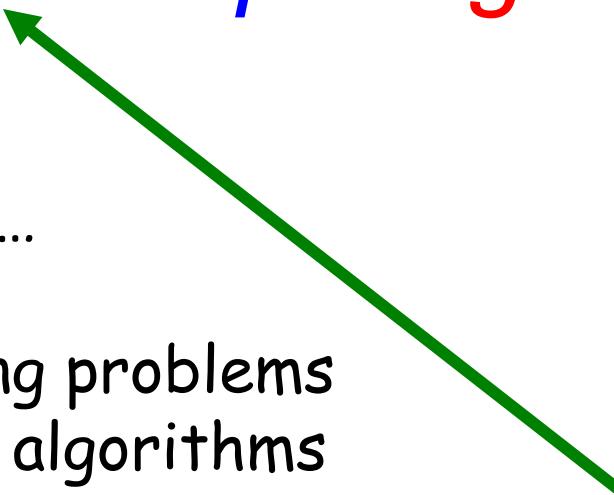
grammar : literature

equations : mathematics



a vehicle, not a destination

**CS == *computing* science**



Computer Science is...

The science of solving problems  
using abstractions & algorithms  
(and computers)!

**"equal to"**

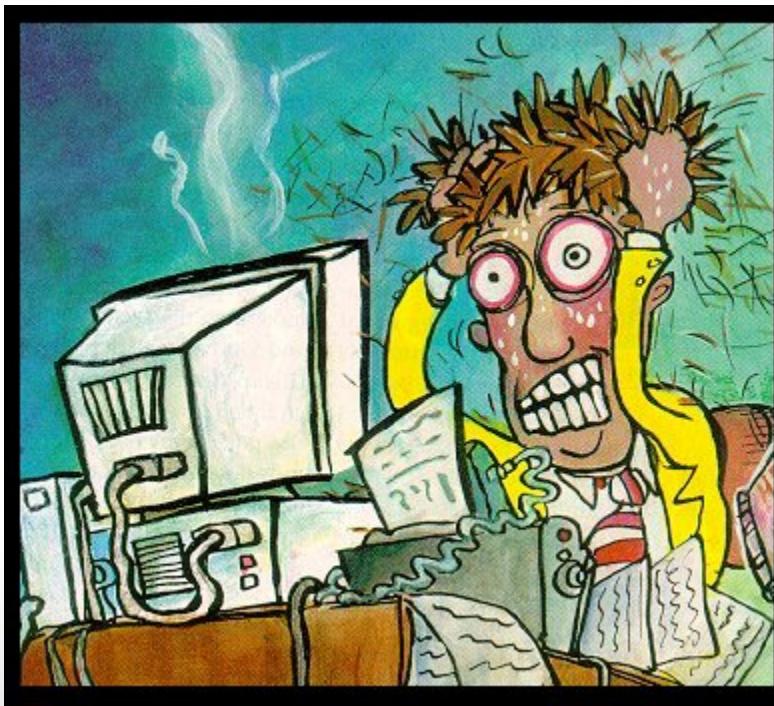
# Expect it to be...

Thrilling!  
And..



# Expect it to be...

Thrilling!  
And...



The most frustrating thing  
you've ever done...  
.... computers just follow  
instructions

# But, there is no magic



- You can understand everything. Really.
- NEVER guess.

# How relevant do you think this class is to you?

- A. Not at all
- B. Somewhat
- C. Very relevant
- D. I don't really know, I am taking it because my major requires it

Other points of view:

[https://www.youtube.com/watch?v=Zwwzryngv\\_o](https://www.youtube.com/watch?v=Zwwzryngv_o)

# Course Logistics

## Graded Components

- Midterm (2): 30%
- Final : 30 %
- Home works : 10%
- Labs : 30%
- Project(1): 2% EC

Refer to the course calendar for all due dates:

<https://ucsb-cs8.github.io/w19-mirza/info/calendar/>

# Resources

- **Course Web Site:**  
<https://ucsb-cs8.github.io/w19-mirza/>
- **Textbook:** “Introduction to Computing Using Python” by Ljubomir Perkovic, 2<sup>nd</sup> edition
- **Iclickers:** Purchase at the bookstore
- **Piazza** (online discussion forum)
- **Gradescope:** Site for graded assignments (labs, homeworks, exams)
- **Open labs and office hours:** This is the best place to get help



# Tomorrow's lab

**YOU HAVE A LAB TOMORROW in Phelps 3525!**

- Complete ic00
- Bring the finished hard-copy with you to lab TOMORROW!
- Read the lab assignment (lab00) before you go into your lab:  
BE PREPARED
- Remember to log out of the lab computers after you are done,  
otherwise you won't be able to log back in.

# Hello Unix!

- Unix is an operating system (just like Windows/Mac)
- The Lab (CSIL) computers use a flavor of Unix
- Today:
  - Learn to work with some basic applications: terminal, IDLE
  - Unix file system and how to navigate it

# Hello Python!

- We'll write a simple program in Python to learn:
  - IDLE: The Python programming environment
  - How to use the Python shell in IDLE
  - How to create and save programs in files in IDLE

# Python Objects

- ▶ Every piece of data in Python is an object
- ▶ Think of an object as a generic container to store data on a computer's memory
- ▶ Every object has a type and value
- ▶ e.g. `x = 3` creates an object of type `int` and value `3`

# Python Data Types

Numeric

Name

Example

What is it?

float

3.14

values with a fractional part

int

42

integers <= 2147483647

str

"Rabbit"

Sequence of characters

bool

True  
False

"Boolean value"

the results from a comparison:

==, !=, <, >, <=, >=

Hey - someone  
can't spell e !

George Boole



# Finding the type ....

But you can change its type... implicitly (i.e. last slide) or explicitly through casting

```
>>> type( 4.2 )
```

```
>>> int( 4.2 )
```

```
>>> type( true )
```

```
>>> float( true )
```

```
>>> type(4)
```

```
>>> float(4) / 5
```

```
>>> type("Rabbit")
```

```
>>> str( 42 )
```

```
>>> type ("42")
```

```
>>> int ("42")
```

( )

\*\*

-

\* / %

+ -

> < ==

=

# Python Operators

set equal to

=

divide

/

remainder

%

power

\*\*

is equal to

==

as usual

{ \*  
+>  
<-  
( )



It's not worth remembering all these %+/\* things!  
You'll get more familiar with these as we go on

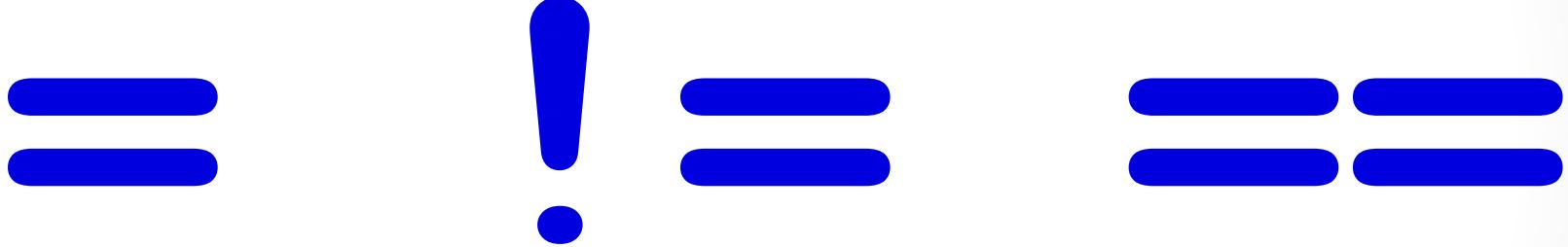
# What does this code do?

```
>> x = 41
```

- A. Sets the value of x to 41
- B. Checks if x is equal to 41
- C. What is the different anyway?

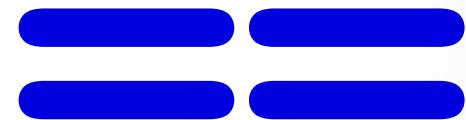
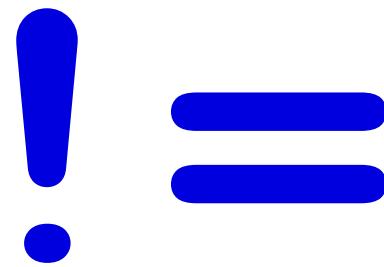


# the "equals" operators



*This is true – but what is it saying!?*

# the "equals" operators



**SET** equals

**isn't** equal to

**IS** equals

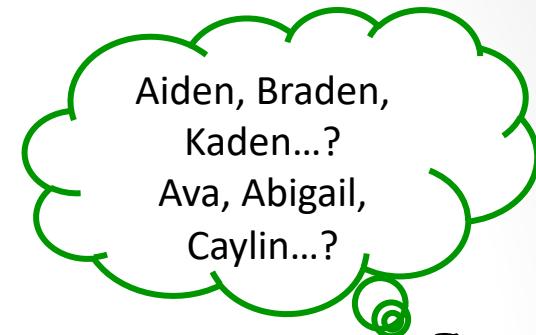
I want === !



# = *names data*

```
>> x = 41
```

```
>> y = x + 1
```



x and y are called “variables”

Don’t confuse them with variables from math

In Python, variables store data



Choosing the right  
name is more important  
than I thought.

# Inside the machine...

What's happening in python:

**x = 41**

**y = x + 1**

# assignment, not equality!

= is an ACTIVE, DIRECTIONAL operator. It means:

“First calculate the value on the right hand side, and then put it into the box labeled with the name from the left hand side (replacing what was there, if necessary).”

It does not test for equality (that’s ==).

`>> x = 41`      “Put 41 into the box labeled x”

`>> y = x + 1`    “Get the value out of x (41), and add 1 to it (42).  
Put that value (42) into the box labeled y”



x

y

# *Re-naming...!*

```
>> x = 41  
>> y = x + 1  
>> x  
41
```

```
>> y  
42
```

```
>> x = x + y  
>> x
```

```
?? (1)  
>> y  
??
```

What value is displayed for x at ??(1)?

- A. 41
- B. 42
- C. 83
- D. 84

“Find the value in x and add it to the value in y. *Then* place that value back into x, replacing what was there.”

x

y

# Input and output

- To output data use **print**

```
>>>print("Hello CS8")
```

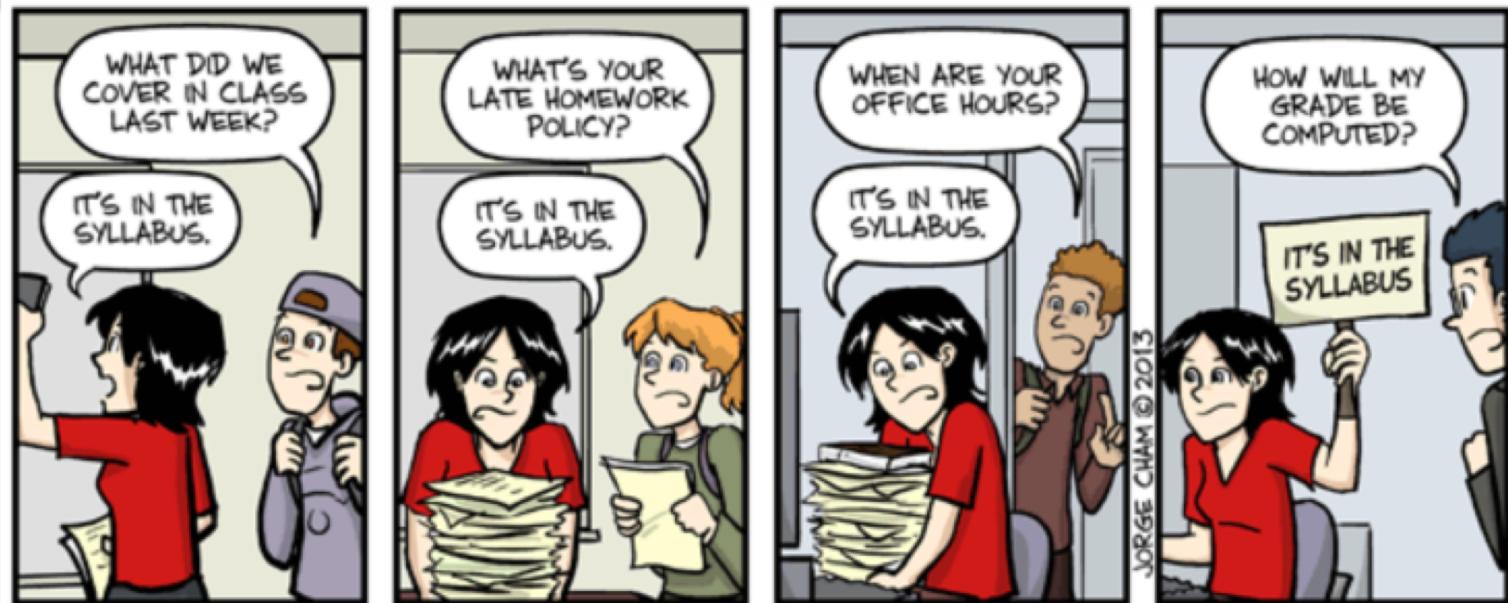
- To get data into your program use **input**

```
>>> name = input()
```

OR

```
>>name = input(" What is your name?")
```

# Just in case



JORGE CHAM © 2013

# IT'S IN THE SYLLABUS

This message brought to you by every instructor that ever lived.

[WWW.PHDCOMICS.COM](http://WWW.PHDCOMICS.COM)

# Your TO DOs

- Visit Piazza after I add you
- Go to the class website
- Complete ic00
- Read Lab00 TODAY
- Do Lab00 TOMORROW (in lab)
- Bring your laptop to open labs (in the evening) if you want help setting it up