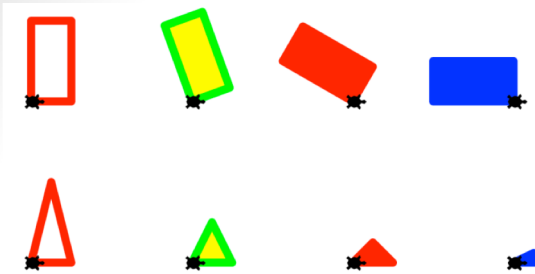
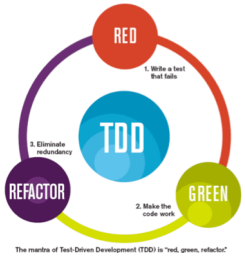
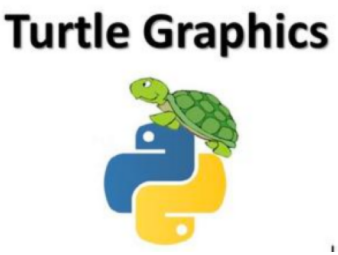
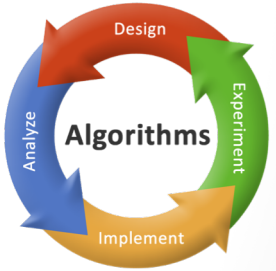




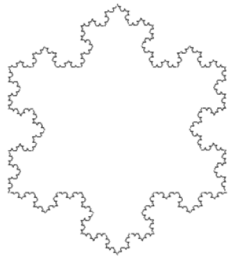


Welcome to CS 8!



Introduction to Computer Science!

https://ucsb-cs8-f18.github.io/



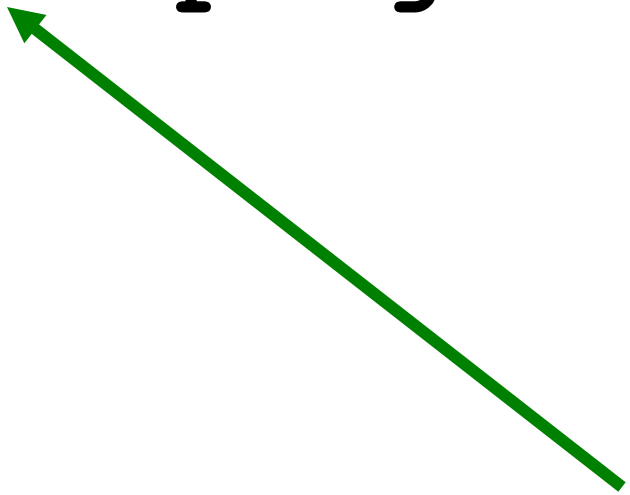
Instructor

- Diba Mirza (dimirza@cs.ucsb.edu)
  - PhD (Computer Engineering, UCSD)
  - Recently joined the department of Computer Science, UCSB!
  - Before this: Teaching faculty at UCSD for three years

- Office: HFH 1155
- Effective this week:
  - Office hours : Thursday: 3:30pm -5pm Or by appointment in **HFH 1155**

```
CS  !=  programming
```

programming : CS ::



"not equal to"

CS != programming

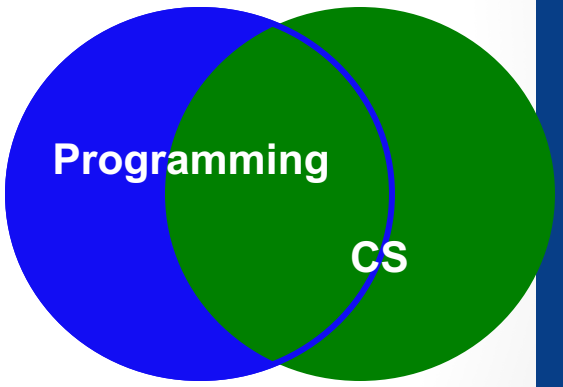
programming : CS ::

surfing : Santa Barbara

machining : engineering

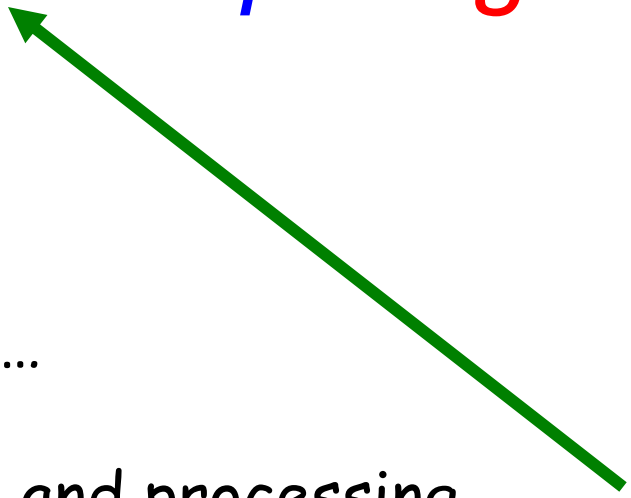
grammar : literature

equations : mathematics



a vehicle, not a destination

CS == *computing* science



"equal to"

Computer Science is…

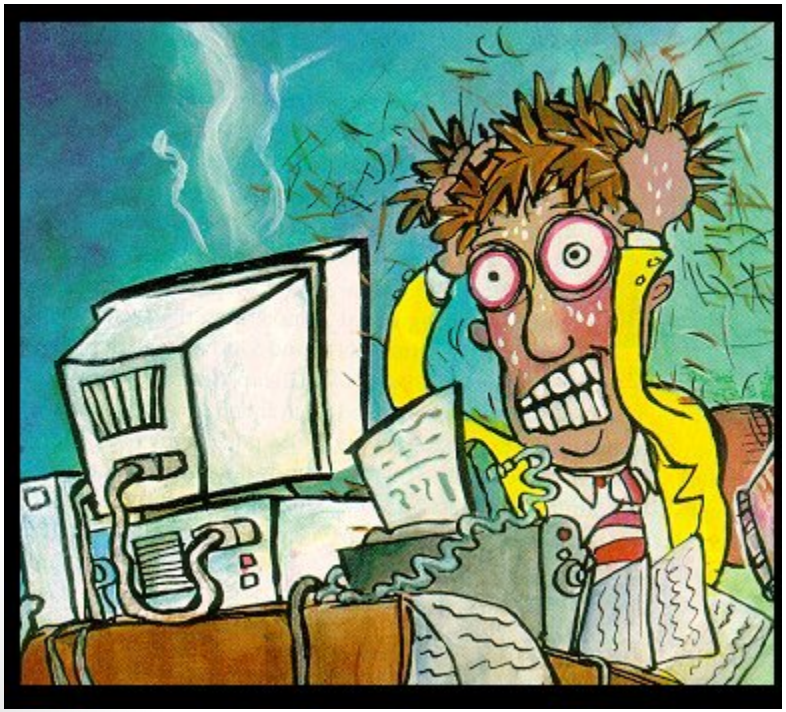
The science of using and processing
large amounts of information
to automate useful tasks
and learn about the world around us
(using a computer)

Expect it to be…

Thrilling!
And..

Expect it to be…

Thrilling!
And…



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

But, there is no magic

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

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

Python as a calculator

- Numerical data types
  - Integer representing non-decimal values
  - float: Floating point number representing a decimal (fractional) value
- Operations with numeric types
  - Arithmetic (+ - * /), Comparison(== < > <= >=)
- Evaluating expressions:
  - Just like writing math expressions
  - Mixed types are okay

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`	the results from a comparison: ==, !=, <, >, <=, >=

"Boolean value"

All data in Python has a type

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

```
>>> type( 4.2 )
>>> type( true )
>>> type(4)
>>> type("Rabbit")
>>> type ("42")
```

```
>>> int( 4.2 )
>>> float( true )
>>> float(4) / 5
>>> str( 42 )
>>> int ("42")
```

Python Operators

Precedence

( ) Highest

**

-

* / %

+ -

> < ==

= Lowest

Caution Level

set equal to =

divide /

remainder %

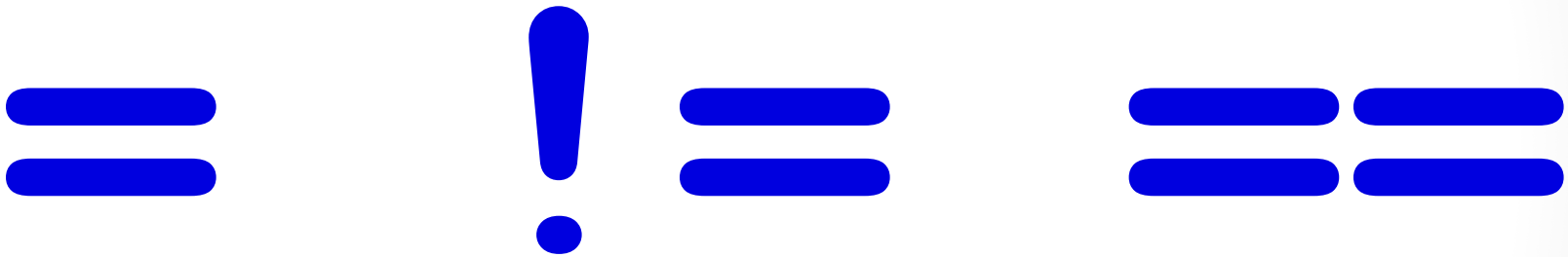
power **

is equal to ==

as usual: * + > < - ( )

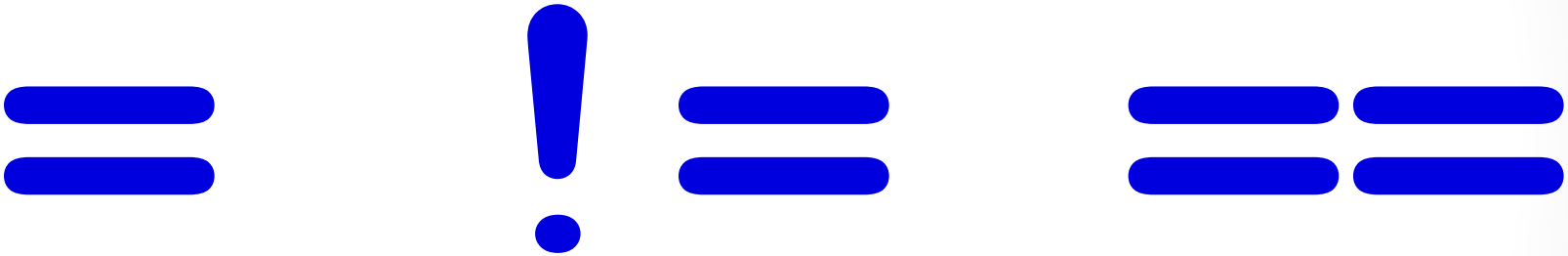
It's not worth remembering all these %+/* things!
I'd go with parentheses over precedence

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:

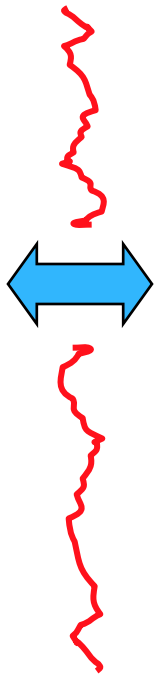
```
x = 41
y = x + 1
```

Inside the machine…

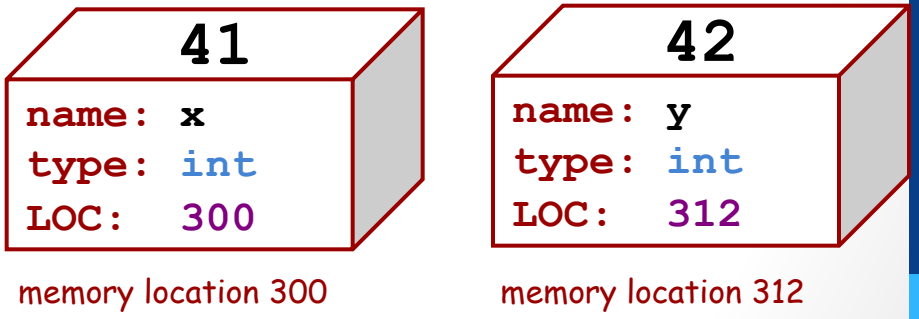
What's happening in python:

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

What is happening behind the scenes:



"variables as containers"



memory location 300

memory location 312

Computation

Data Storage

id, del

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 [ ]

Re-naming…!

```
>> x = 41
>> y = x + 1
>> x
41
>> y
42
>> x = x + y
>> x
?? (1)
>> y
?? (2)
```

What value is displayed for y at ??(2)?

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 

Re-naming…!

```
>> x = 42
>> y = x
>> x = 101
>> x
??
>> y
??
```

What values are displayed for x and y?

	x	y
A.	42	42
B.	101	42
C.	101	101
D.	None of these	

x

y

When in doubt, draw it out!!

Re-naming…!

```
>> x = 42
>> y = x
>> x == 101
>> x
??
>> y
??
```

What values are displayed for x and y?

	x	y
A.	42	42
B.	False	False
C.	101	42
D.	False.	42
E.	None of these	

x

y

When in doubt, draw it out!!

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?”)

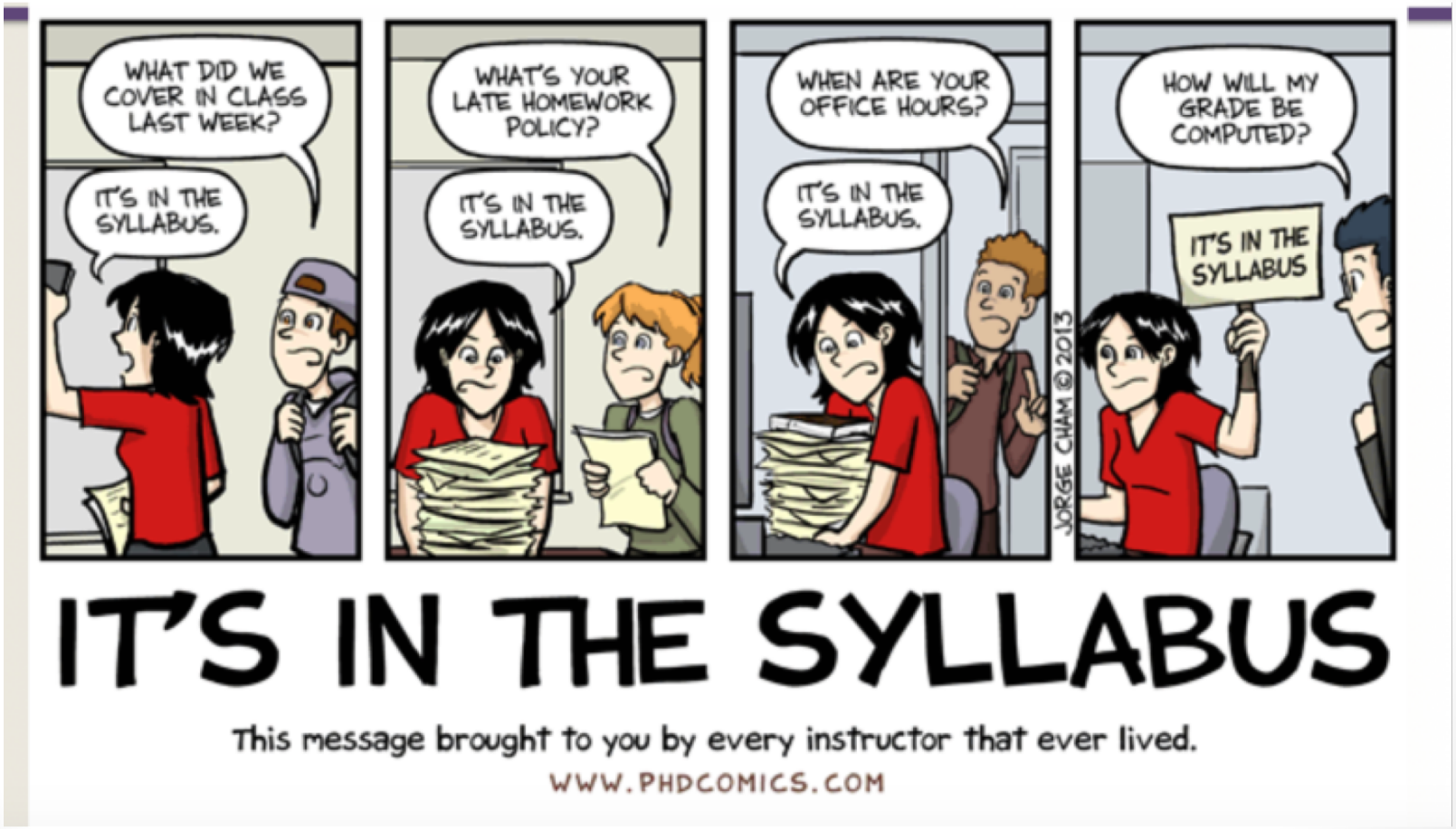
Resources

- Course website for details:

https://ucsb-cs8-f18.github.io/

- Textbook: “Introduction to Computing Using Python” by Ljubomir Perkovic, 2nd edition
- Iclickers: Purchase at the bookstore
- Piazza (online discussion forum):
- TA/tutor instructor lab office hours
- Let’s take a look at the website

Just in case


WHAT DID WE COVER IN CLASS LAST WEEK?
IT'S IN THE SYLLABUS.
WHAT'S YOUR LATE HOMEWORK POLICY?
IT'S IN THE SYLLABUS.
WHEN ARE YOUR OFFICE HOURS?
IT'S IN THE SYLLABUS.
HOW WILL MY GRADE BE COMPUTED?
IT'S IN THE SYLLABUS
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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 lab if you want help setting it up
- I recommend that you watch this 10 minute video about CS and coding:

https://www.youtube.com/watch?v=IoPx_rSicrM