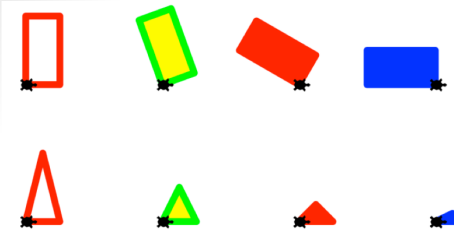
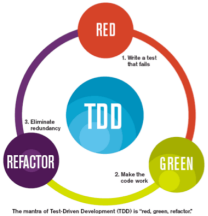
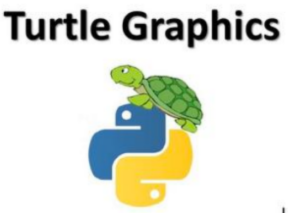
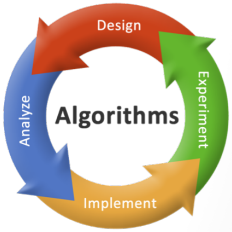


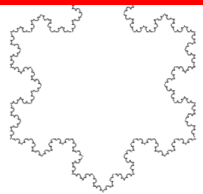




# Welcome to CS 8!




Introduction to Computer Science!

**Enrollment: 113/105**





# Instructor

- Diba Mirza (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

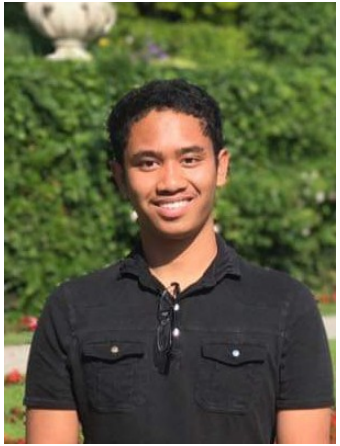
# Course staff

Anacaren

Mohith

**Schedule for all lab and office hours:** https://ucsb-cs8.github.io/w19-mirza/info/lab_office_hours/

Taylor



Jared

Madhu

# 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.

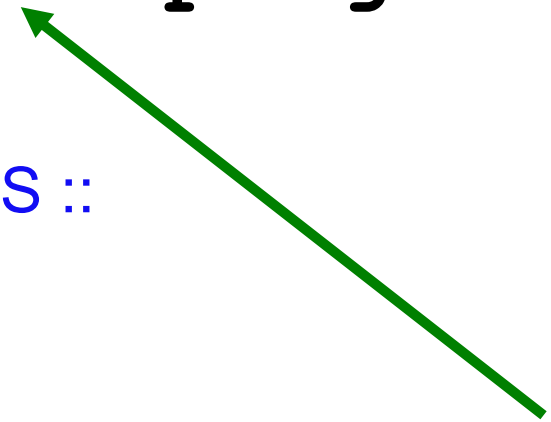
# This course: Intro to CS!

What does the term Computer Science mean to you?

- Programming + Program Languages
-

```
CS  !=  programming
```

programming : CS ::



**"not equal to"**

# CS != programming

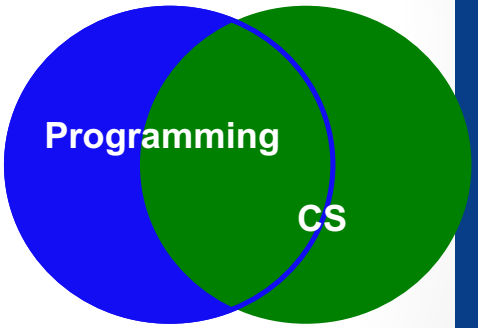
programming : CS ::

surfing : Santa Barbara

machining : engineering

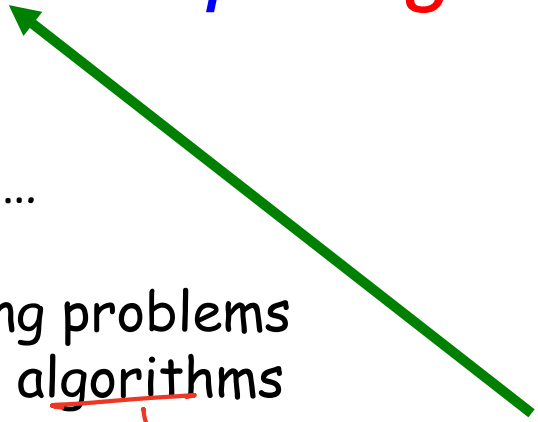
grammar : literature

equations : mathematics




a vehicle, not a destination

# CS == *computing* science



Computer Science is…

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

hiding details

+

recipes for solving problems

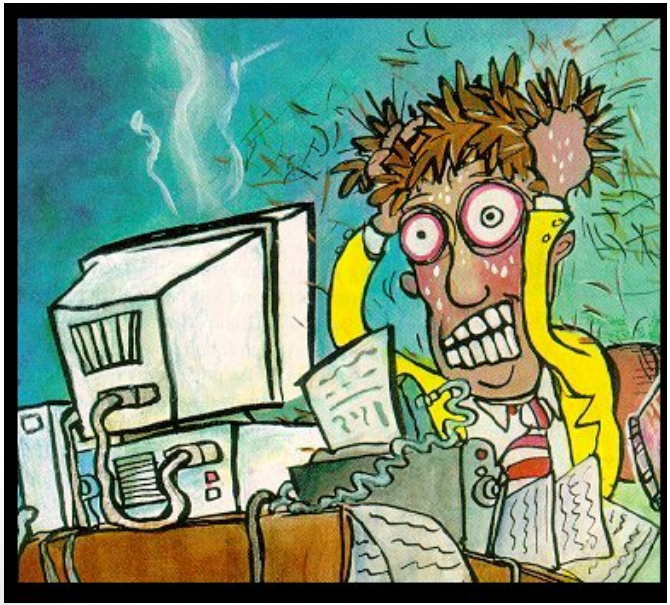
**"equal to"**

# 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

# 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, 2nd 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`<br>`False` | the results from a comparison:<br>==, !=, <, >, <=, >= |


"Boolean value"

# Finding the type ….

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

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

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

```
>>> type( True )
```
bool

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

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

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

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

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

```
>>> type ("42")
```
str.

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

Some of these operators can be used with different data types (eg. the operator *)

# Python Operators

( )

** raised to the power e.g. 2 ** 3 = 8

-

* / %

+ -

> < == equality

= assignment

>>> "UCSB" * 2
"UCSB UCSB"

>>> 2*2
4

>> X = 3

set equal to =

divide /

remainder %

power **

is equal to ==

as usual: * + > < - ( )

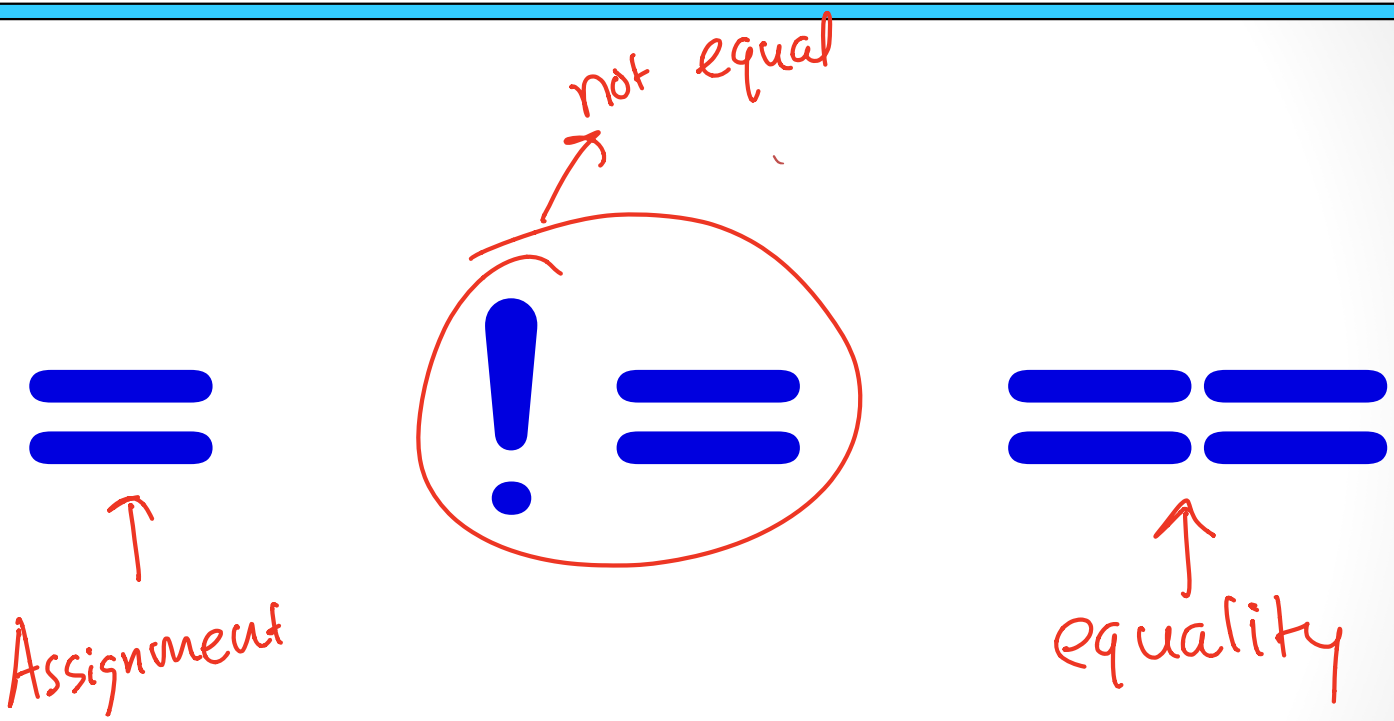
It's not worth remembering all these %+/* things!
You'll get more familiar with these as we go on

# 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!?***

Assignment is not equal to equality!

# the "equals" operators

=

**SET** equals

!=

**isn't** equal to

==

**IS** equals

I want === !

# = names data

Assignment

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

During an assignment, the expression on the right of the = operator is evaluated first. The result is stored in the variable on the left.

41 + 1 → 42

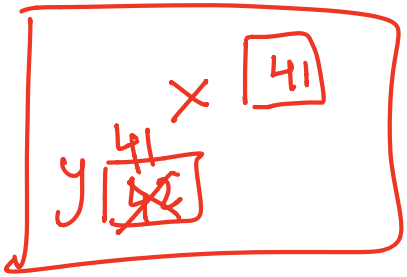
Memory

Aiden, Braden, Kaden…?
Ava, Abigail, Caylin…?

```
>>> y = x
>>> x == y
True
>>> 2 = x == y
>>> 41 = x
```

→ Can't do this!

Error




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
??
```

41 42

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 ~~41~~ 83

y 42

y is not changed

y = x+1 is not an equation!

# Input and output

- To output data use **print**

  **>>>print(“Hello CS8”)**

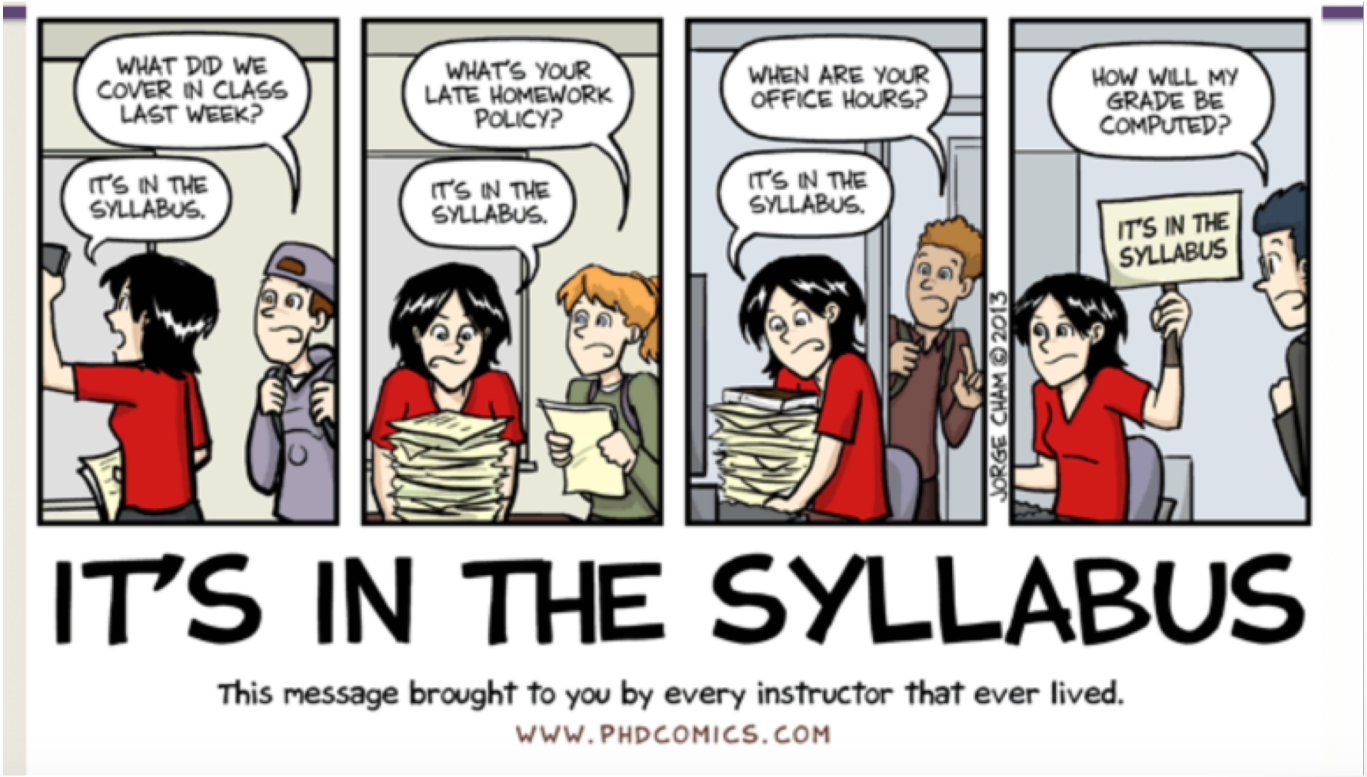
- To get data into your program use **input**

**>>> name = input()**

**OR**

**>>name = input(“ What is your name?”)**

# Just in case


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
JORGE CHAM © 2013
IT'S IN THE SYLLABUS
This message brought to you by every instructor that ever lived.
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