

5:Statements, expressions, functions, keyword args

Tuesday, January 18, 2022 9:32 PM

Teaching notes: it's important to find time to cover so material so maybe shuffle things

This also runs a little long still but is better than it was

Announcements

CS mentoring program

Wednesday, April 6, 2022 4:08 PM

For those who don't know, the CS Mentoring Program pairs students in the major (or grad students) with students intending to major in CS. We focus on the six courses above to make our announcement each quarter, but anyone intending to major in CS is welcome to be a mentee, and any student in a department major who will not be graduating this quarter is welcome to be a mentor.

Sign up to be a mentor or mentee here: <https://cs.wwu.edu/cs-mentoring-program>

"I walked down a street where the
houses were numbered 64K, 128K, 256K, 512K & 1MB.
That was a trip down memory lane."

Norms

Monday, April 4, 2022 1:42 PM

Posted!

Assignment for pet pictures

Be welcoming to students of all backgrounds and experiences:

- Talk to people you're not close with
- Introduce yourself to the people sitting around you and try to get to know them. It makes the class more enjoyable all together.
- Be aware that some people in the class may feel like they do not belong there because of what society tells them they can be, do not add to that feeling.
- Students should encourage others to share their ideas
- Students should try to refrain from exclusive statements like "that was so easy".
- Students should be respectful when others make mistakes. Allowing students to feel comfortable making mistakes can encourage them to participate in class more often.

Help each other:

- Try to make it known in the discord or any other group chats if you have a good grip on the material. It can make it easier for those who are struggling to reach out, especially if only a few people are struggling and people have not reached out for help already.
- Encourage reminders of assignments between classmates.
- Study groups and discussions help with both understanding and that sense of community. Cooperation can really help
- We should be more than willing to give advise to our peers, sometimes people need it but are too afraid to ask.
- Discuss as a class what we found was struggling to do on an assignment, so no one feels like they're the only ones who don't understand a topic.
- For those who already have a history of programming, become a teacher for those who may not understand what they are supposed to do, and suggest resources.

Keep class quiet at the end:

- I believe some norms for students should be to try and find a seat on the side or close to a door if you know you are planning to leave the class early.
- Discourage shuffling/zipping of bags and supplies until the lecture is over. AKA don't pack up until the professor is finished lecturing whether at 12:50 or 12:51.

CPU review

Friday, September 23, 2022 4:18 PM

Multiply 3 by 4, Save in total

Add 2 to total

Print total to screen

- 1. fetch next instruction
 - 2. decode instruction (CS1247)
 - 3. Execute instruction
- repeat
(Yes this is a simplification)

CPU processes strictly in order

Data in memory may change with each instruction!

(More super interesting details in future classes!)

Pseudocode and Algorithms

Sunday, January 9, 2022 2:13 PM

Algorithm: step by step procedure
to solve a problem

Pseudocode: using regular English to
plan out algorithm
(No : using correct syntax)
Yes: planning & thinking)

Programming ... large and small ... is an art and a science

Real-world scenario Write a "program" to keep track of employee work hours

Goal of this course : proceed from problem -> program (implementation of solution)



5 min

Instructions: plan it on paper!

Invite 2 people to come up to doc cam
(give handout)

one person share screen type
breakout room of 3
'Focus mode'

Keyword arguments

Tuesday, January 11, 2022 10:57 PM

<https://docs.python.org/3/>

4 Write this down
so useful

1 Library Reference

keep this under your pillow

2 Built-in Functions

P

3 pow()
print()
property()

arguments

`print(*objects, sep=' ', end='\n', file=sys.stdout, flush=False)`

all the technical details

You'll learn to read: understand as
You take more classes

For now:

*objects

one or more objects
(everything in Python is an object)

So variables

strings

ints

floats

etc

arguments with = are keyword args
optional settings

Optional setting

lets try setting them; see what happens!

```
1 print("Bellingham", "WA", "USA", sep="-")
```

type in the chat your guess on what this will do
(typo)

```
1 #sep means separator. What goes between each argument you include  
2 #Default is a single space  
3  
4 print(1,2,3,4,sep="") #what will this print?
```

The nice thing about code is you can always just try it!

```
1 #end means...  
2 print(1,2,3,4,end="$") #what will this print?  
3  
4 #to see full effect  
5 print("self care lip sych") |
```

So what did '\n' mean?

```
1 #end means...  
2 print(1,2,3,4,end="\n\n\n")  
3  
4 #to see full effect  
5 print("self care lip sych")
```

New line ↘

```
1 print("line one \n line two")
```

Statements and Expressions

Tuesday, January 11, 2022 11:18 PM

Statements: It lines which Python executes
No value returned
Can't print
 $a = 4.3$ it does a thing
Not a function

Expression: Combination of function calls,
values, variables, operators
evaluates to a value \Rightarrow
(Can print)
 $4 + 3$
 $\text{type}(43)$
 $\text{int}("1")$
 $\text{int}(a) * 4 \Rightarrow 16$
= means save in variable

Operators

Symbols that represent Computations
 $+$ $-$ $*$ etc

Operands values that operators perform
Calculations on
 $\text{my_grade} = 82$
Assignment operator

Assignment operator

More operators

// Floating Point division

```
1 print(3/2) #demo  
2  
3 #what do you think?  
4 print(3.0/2)  
5 print(7/2)  
6 print(4/2)
```

** Exponent

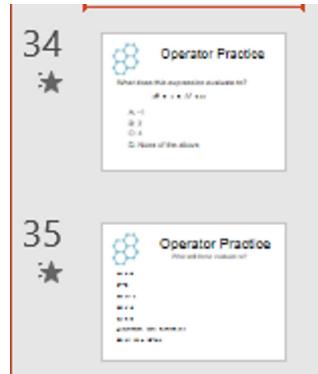
2^4 same as $2 \cdot 2 \cdot 2 \cdot 2 \Rightarrow 16$

$2^{4 \text{ exponent}}$
 2_{base}

// Integer division

```
1 print(3//2) #demo  
2  
3 #what do you think?  
4 print(3.0//2)  
5 print(7//2)  
6 print(4//2)
```

Flat. No round.



A B C D

Breakout
Rooms

Note: “ \neq ”

a = "Famous quote"

So be careful if you copy
code from typed notes into
Thonny

Print and operator exercise

Tuesday, September 27, 2022 2:48 PM

a = 31

b = a // 4

c = (5 % b) - 1.0

print("a", a ** 0, sep=":", end="; ")

print("b", b-4, sep=":", end="; ")

print("c", c * 2 , sep=":")

A:	Won't run, it has a bug
B:	a: 1; b: 3; c: 8.0
C:	a: 1; b: 3; c: 8.0
D:	a a ** 0 b b-4 c c*2

Functions - what is review

Tuesday, January 11, 2022 10:48 PM

Functions take 0+ pieces of information and return 0+ pieces of information. Example

```
1 here = "remote"  
2 print("I am", 100, "percent excited to be", here)
```

Paren ↑
 comma separated list of
 arguments

↑ close Paren
Variable

Output is called 'return value'

arguments →  → return value
=  Save it or you
drop it on the
ground

ord.py x

```
1 result_1 = print("yo")  
2 result_2 = input("Why")
```

Variables x

Name	Value
result_1	None
result_2	"cause"

Print doesn't have a return value
input does

Problems with floating point

Monday, September 26, 2022 11:01 AM

```
1 math1 = 0.1 + 0.1
2
3 print(math1)
4
5 math2 = math1 + 0.1
6
7 #print(math2)
8
9 #what will this print?
10 # A 0.3000000000000004
11 # B 0.3
12 # C This will cause an error
13 # D This is a trick question, right?
14
```

Write down on paper the base 10 representation (in floating point!) of 1/3

.3333333~ forever.

Why can't we write this?

Limitations of fractions in base 10

Base 2 has limitations in fractions too. Just different ones.

[15. Floating Point Arithmetic: Issues and Limitations — Python 3.10.7 documentation](#)

"

For use cases which require exact decimal representation, try using the [decimal module](#) which implements decimal arithmetic suitable for accounting applications and high-precision applications.

Another form of exact arithmetic is supported by the [fractions module](#) which implements arithmetic based on rational numbers (so the numbers like 1/3 can be represented exactly).

If you are a heavy user of floating point operations you should take a look at the NumPy package and many other packages for mathematical and statistical operations supplied by the SciPy project. See [<https://scipy.org>](https://scipy.org).

Python provides tools that may help on those rare occasions when you really *do* want to know the exact value of a float. The [float.as_integer_ratio\(\)](#) method expresses the value of a float as a fraction:

From <<https://docs.python.org/3/tutorial/floatingpoint.html#tut-fp-issues>>

"

Syllabus reminder

Sunday, January 9, 2022 2:03 PM

Show how to find on Canvas ↗

Office Hours

- Tuesday Thursday 8:40 -9:30 am in CF 404
- By appointment (email to request)

Any changes or cancellations will be posted to Canvas. Office hours are for everyone to ask questions, have me take a look at your homework, or even just to chat about CS. They're drop-in – no need to email ahead of time 😊

5

Syllabus Questions?

6

Syllabus Questions!

- You are given 3 "slip days" that allow you to submit something 24 hours late without penalty.
- These can be used for:
 - A: labs
 - B: assignments
 - C: in class quizzes
 - D: exams

ABCD

Demo slip day

7

Syllabus Questions!

According to the academic honesty policy, which of the following are permitted?

- A. Talking about the assignment with your classmates using pseudocode
- B. Looking at a classmate's code, then immediately sitting down and typing out a very similar program
- C. Using code written for CSCI 141 from a previous quarter
- D. Copying and pasting a few lines of someone else's code into your solution, if you understand those lines in detail.

More later today!

Bridges Results

10

Preliminaries : The e-Book

- The e-book is free
- Register for course CSD141W22
- <http://interactivepython.org/runestone/static/thinkcspy/index.html>



Use the online python interpreter (embedded into the website) to run and modify code "as you read" on the fly
(demo)

Number 1 piece of advice from last quarter's students: read the book

CSO 141 Computer Programming I

11

Preliminaries : Announcements

- TA office hours are posted to the Syllabus
- You are responsible for the content of the lecture slides AND the on-line e-book material suggested on the course website.

Thonny is available, free, for download at <http://thonny.org/>

CSO 141 Computer Programming I

12

Preliminaries : Homework 1

Q: After how many minutes, hours, days of staring at the same line of code should you seek help?

A. 5 minutes
B. 30 minutes
C. 3 hours
D. You must figure everything out on your own

Discord (show)

In this class, I'm going to give you a bunch of tools you can use to assemble programs

I won't show you step by step how to do this. That's the art of programming!

I will give examples, and help you understand how the tools work

But you'll need to figure out how to combine the tools you have to write the code that does what you want

But first, you need to know what you want the code to do!