

CSCA08 TUTORIAL WEEK 4

*** There will be a **quiz** about **memory models** at the beginning of the class! ***

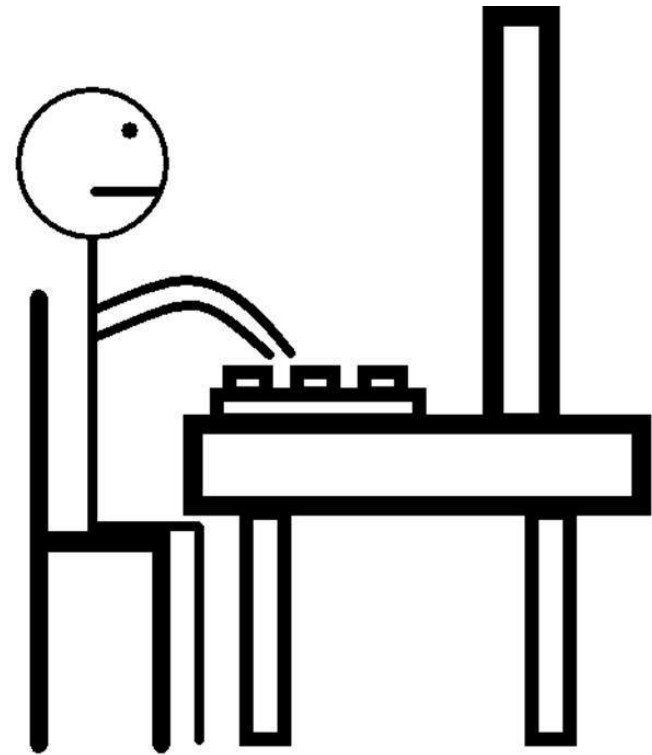
This is Bob.

Bob uses design recipe to write functions.

Bob writes clear documentation for his colleagues and the future himself.

Bob is smart.

Be like Bob.



* Idea plagiarized off Kevin Gao

THIS WEEK

Quiz!

Design recipe

Doctest

PEP-8 style

DESIGN RECIPE

Header

Type Contract

Requirements

Examples

Description

Internal Comments

Code

Test

COMMENTING

Internal Commenting:

- Explains what this line of code does
- Written for programmers(including yourself)
- Started by a # sign

External Commenting:

- Explains what this function does
- Written for users
- Denoted by ''' ''' or """ """

EXAMPLE

To Wing!

Function 3: Biographical Data

Create a function called `student_data`, that takes 4 parameters, a name (a string), age (an integer), student number (a string) and whether they are enrolled in CSCA08 (a boolean), and returns a string containing that information in the following format: `<student number,name,age,enrolled>`². It may be helpful to remember that you can cast a number or a boolean to a string using the `str` function. Your code should work as follows:

```
>>> student_data("Brian",35,"1234567",False)
'<1234567,Brian,35,False>'
>>> student_data("Nick",97,"0000001",True)
'<0000001,Nick,97,True>'
```

DOCTEST

How do you test your code?

Doctest: a piece of code that automatically runs example function calls in the Docstring, and compares the expected result with the actual result

```
if __name__ == "__main__":  
    import doctest  
    doctest.testmod(verbose=True)
```

To Wing!

PEP-8 STYLE

What is good writing style?

this is a simple paragraph that is meant to be nice and easy to type which is why there will be mommas no periods or any capital letters so i guess this means that it cannot really be considered a paragraph but just a series of run on sentences this should help you get faster at typing as im trying not to use too many difficult words in it although i think that i might start making it hard by including some more difficult letters I'm typing pretty quickly so forgive me for any mistakes i think that i will not just tell you a story about the time i went to the zoo and found a monkey and a fox playing together they were so cute and i think that they were not supposed to be in the same cage but they somehow were and i loved watching them horse around forgive the pun well i hope that it has been highly enjoyable typing this paragraph and i wish you the best of luck getting the best score that you possibly can

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38 ■ CHAPTER 1 PRECALCULUS REVIEW

(vii) *half-angle formulas*

$$\sin^2 \theta = \frac{1}{2}(1 - \cos 2\theta), \quad \cos^2 \theta = \frac{1}{2}(1 + \cos 2\theta)$$

(follow from the double-angle formulas)

In Terms of a Right Triangle For angles θ between 0 and $\pi/2$, the trigonometric functions can also be defined as ratios of the sides of a right triangle. (See Figure 1.6.11.)

$$\begin{aligned} \sin \theta &= \frac{\text{opposite side}}{\text{hypotenuse}}, & \csc \theta &= \frac{\text{hypotenuse}}{\text{opposite side}}, \\ \cos \theta &= \frac{\text{adjacent side}}{\text{hypotenuse}}, & \sec \theta &= \frac{\text{hypotenuse}}{\text{adjacent side}}, \\ \tan \theta &= \frac{\text{opposite side}}{\text{adjacent side}}, & \cot \theta &= \frac{\text{adjacent side}}{\text{opposite side}}. \end{aligned} \quad (\text{Exercise 81})$$



Figure 1.6.11

Arbitrary Triangles Let a , b , c be the sides of a triangle and let A , B , C be the opposite angles. (See Figure 1.6.12.)

$$\text{area } \frac{1}{2}ab \sin C = \frac{1}{2}ac \sin B = \frac{1}{2}bc \sin A.$$

$$\text{law of sines } \frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}, \quad (\text{taken up in the exercises})$$

$$\begin{aligned} \text{law of cosines } a^2 &= b^2 + c^2 - 2bc \cos A, \\ b^2 &= a^2 + c^2 - 2ac \cos B, \\ c^2 &= a^2 + b^2 - 2ab \cos C. \end{aligned}$$

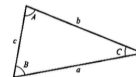


Figure 1.6.12

Graphs Usually we work with functions $y = f(x)$ and graph them in the xy -plane. To bring the graphs of the trigonometric functions into harmony with this convention, we replace θ by x and write $y = \sin x$, $y = \cos x$, $y = \tan x$. (These are the only functions that we are going to graph here.) The functions have not changed, only the symbols: x is a rotation that takes $A(1, 0)$ to the point $P(\cos x, \sin x)$. The graphs of the sine, cosine, and tangent appear in Figure 1.6.13.

The graphs of sine and cosine are waves that repeat themselves on every interval of length 2π . These waves appear to chase each other. They do chase each other. In the chase the cosine wave remains $\frac{1}{2}\pi$ units behind the sine wave:

$$\cos x = \sin(x + \tfrac{1}{2}\pi).$$

Changing perspective, we see that the sine wave remains $\frac{1}{2}\pi$ units behind the cosine wave:

$$\sin x = \cos(x + \tfrac{1}{2}\pi).$$

All these waves crest at $y = 1$, drop down to $y = -1$, and then head up again.

The graph of the tangent function consists of identical pieces separated every π units by asymptotes that mark the points x where $\cos x = 0$.

PEP-8 STYLE

```
def my_func():
```

```
    #this line of code does something interesting
```

```
        result=1+2*3/4+5-6+7/8*9+10
```

```
    #i am a comment
```

```
        #i am another comment
```

```
    return result
```


PEP-8 STYLE

```
def my_func():  
    # this line of code does something interesting  
    result = 1 + 2 * 3 / 4 + 5 - 6 + 7 / 8 * 9 + 10  
    # i am a comment  
    # i am another comment  
    return result
```

PEP-8 STYLE

A style guideline of Python code

- Space around operators
- Blank lines contain no spaces
- Empty line at end of file
- Each line contains no greater than 80 characters
- Space after commas
- And much more...
- You're not expected to memorize these rules!

PEP-8 STYLE CHECKER

<http://pep8online.com/>

PEP-8 STYLE CHECKER

You're not expected to memorize these rules, but on a test, they should be sensible!

(81 characters in a line won't be penalized 200 characters will!)

From now on, PEP-8 counts 1 mark in exercises/assignment!

Make sure your code passes the style checker before submitting!

Make sure you test your code again after fixing PEP-8!

REMINDERS

Term Test 1!

- September 30th (Sat), 9am – 11am
- Room Allocation

What to study?

- Past exams
- Practical materials
- Piazza

Exercise 2

- Due: Oct 1, 2017. 5:00pm
- Pre-Run: Sept 29, 2017. 5:00pm

Room #	Last Name
IC 230	A - B
IC 130	C - HO
IC 220	HU - KI
SW 309	KO - LU
SW 319	LY - Q
SW 128	R - S
HW 216	T - W
HW 215	X - YE
SW 143	YO - Z