CSCA08 Tutorial Week 4

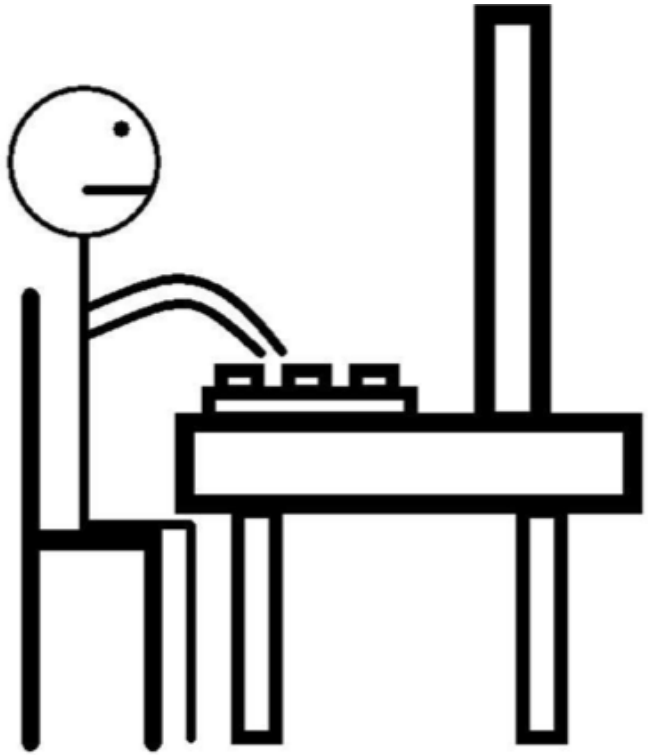
This is Bob.

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

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This Week

Design recipe

Doctest

PEP-8 style

Design Recipe

Header

Type Contract

Requirements

Examples

Description

Interal 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&#039;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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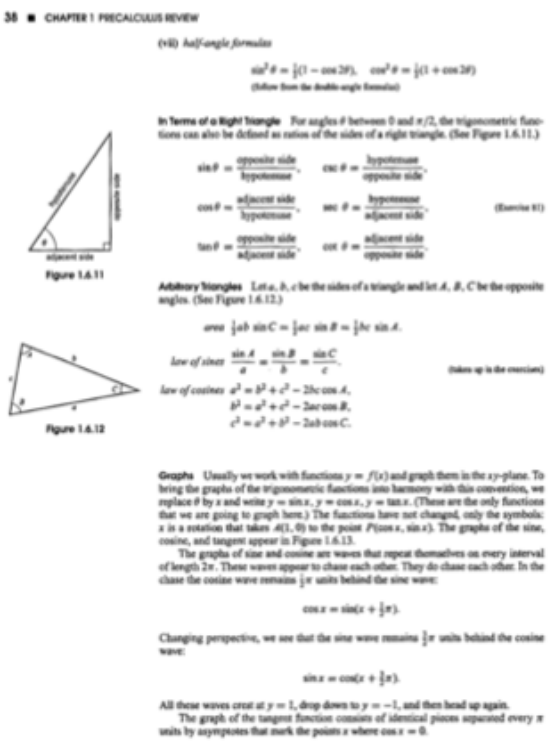

38 ■ CHAPTER 1 PRECALCULUS REVIEW

(viii) *half-angle formulas*

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

(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.)

Figure 1.6.11

$$\sin\theta = \frac{\text{opposite side}}{\text{hypotenuse}}, \quad \csc\theta = \frac{\text{hypotenuse}}{\text{opposite side}},$$

$$\cos\theta = \frac{\text{adjacent side}}{\text{hypotenuse}}, \quad \sec\theta = \frac{\text{hypotenuse}}{\text{adjacent side}}, \qquad \text{(Exercise 81)}$$

$$\tan\theta = \frac{\text{opposite side}}{\text{adjacent side}}, \quad \cot\theta = \frac{\text{adjacent side}}{\text{opposite side}}$$

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.)

Figure 1.6.12

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

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

$$\textit{law of cosines} \quad a^2 = b^2 + c^2 - 2bc\cos A,$$
$$b^2 = a^2 + c^2 - 2ac\cos B,$$
$$c^2 = a^2 + b^2 - 2ab\cos C.$$

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 notation 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

Assignment	Upload Date	Deadline Date	Deadline Time
1	2-Feb	18-Feb	11:30 PM

Term Test 1	Term Test 2	Final
February 12th, 2018. 17:00 - 19:00	March 5th, 2018. 17:00 - 19:00	TBA