Practical Questions

CSCA08 Fall 2017 – Week 4

Question # 1

What values do the following expressions resolve into? (Show your work)

a) 1 == 1
b) 3 == 3.0
c) 2 < 1
d) 3>= 2
e) not(3 > 2)
f) ((3 != 2) and (2 > 3))
g) ((3 <= 3) or (2 != 5))
h) ((3 >= 1) and ((2 == 1) or not(1 == 2)))
i) (((7 > 5) and (5 >= 3) and not (4 == 5) and ((3 > 2) or (2 > 3)) and (not((3 ==9) or (4 >= 3)))) or (1 == 2))
j) **(CHALLENGE)**
(not(((2 <= 3) or ((54 >= 54) and (55 > 54))) and (((360 == 361) or (3 < 2) or (6 > 7) or not(2 >= 3)) and not((3 == 4) or (not(9 == 9) and ((9 >10) or (10 > 9)))) and (2 < 3))) and (((5 >= 5) and (4 <= 5)) or ((66 < 67) and (67 <= 66)) and not ((3 < 4) and ((4 <5) and (3 == 2)))) and ((77 >= 76) or not(77 < 75)))

Question # 2

Write the external documentation (DocString) for the following functions. Remember to follow the design recipe as taught in lecture (you have to provide a function description in your own words, don't just copy ours).

a) (float) -> float, float
Return the area and perimeter of a circle given its diameter.

b) (str) -> str
Return a personalized greeting, specifically addressed to the Name given.

c) (float) -> float, float
Return the temperature in Fahrenheit and Kelvin given the temperature in Celsius

d) (float) -> float,float,float,float,float,float
Return the given number raised to the first 6 powers

e) (str, int) -> str
Return the first n letters of the given string (where n is the given number)

f) (str, int) -> str
Return the given string with every even letter capitalized and every odd number lowercase

g) (int) -> str
Return the letter of the alphabet that corresponds to the integer given

Question # 3

Write the code for the function examples provided for each questions. Remember to follow the design recipe as taught in lecture (create your own examples, don't copy ours).

a) >>> doubler(2)
4
>>> doubler(-5)
-10
>>> doubler(1)
2

b) >>> squarer(13)
169
>>> squarer(1)
1
>>> squarer(2.5)
6.25
>>> squarer(-2)
4

c) >>> squarer2(7)
49
>>> squarer2(-5)
25
>>> squarer2(2.8)
8
>>> squarer2(6.2)
39

d) >>> str_parse("TWO")
"OWT"
>>> str_parse("HELLO")
"LOLHE"
>>> str_parse("FRIENDS")

“NDSEFRI”
>>> str_parse(“KELP”)
“PLKE”
>>> str_parse(“HARRINGTON”)
“GTONNHARRI”

e) >>> in_cms(“CSCA08”)
True
>>> in_cms(“MATA31”)
True
>>> in_cms(“PSYA01”)
False

f) (CHALLENGE)
http://www.mto.gov.on.ca/english/safety/safe-driving-practices.shtml#speedlimits for table
For challenge point, must be done without if statements

>>> speeding_fine(61, 60)
3
>>> speeding_fine(103, 70)
231

g) >>> can_post_cs(“CSCA08”, “CSCA48”, “CSCA67”, “PSYA01”, “PHYA10”, “MATA23”, “MATA31”, “MATA37”, “ENGA01”, “LINA01”)
True
>>> can_post_cs(“CSCA08”, “CSCA67”, “MATA37”, “PSYA01”, “PHYA10”, “MATA23”, “MATA31”, “MGTA01”, “ENGA01”, “LINA01”)
False

h) (CHALLENGE)
>>> Unknown(1)
0
>>> Unknown(5)
3
>>> Unknown(10)
34
>>> Unknown(15)
377
>>> Unknown(3)
1
>>> Unknown(9)
21

Discussion Questions

Question # 4

According to the design recipe taught in lecture, there are a great many steps that have to be completed before you even begin coding? Why do you think it is important to complete these steps before you actually program your exercise or assignments? What do you get from writing examples, a description and requirements that you may not have had if you just started coding before you did the previous steps in the design recipe?

Question # 5

In the design recipe, you are asked to write to comments explaining what your code will do before you actually write your code. Compare this to writing you code and then doing the comments afterwards. What happens in both cases if you look at what you had done and realized you needed to move pieces of code around? What happens if you have to write multiple functions that need to rely on each other to complete their task properly?

Question # 6, The "Logic Question" **(Challenge)**

The mad king has captured you and 100 of your comrades. Tomorrow at noon, he plans to line you all up single file, and place either a red or a blue cap on each of your heads. You will be able to see everyone in front of you, but you can't see your own cap, or the caps of anyone behind you. The guards will then start at the back of the line (the person that can see everyone else, and whom no one else can see), and one-by-one, they will ask each person what colour cap they are wearing. If they answer correctly, they go free, if they get it wrong, they will be executed (we told you he was a mad king). How many of you can be certain of survival? Assume that you can see everyone in front of you clearly, but you can't communicate with them in any way aside from answering the guard's question loud enough for them to hear. (And no being sneaky and saying 'A cough before you answer means the hat in front of you is red')