

# COMP10001 Foundations of Computing

## Semester 2, 2016

### Tutorial Questions: Week 4

1. What is wrong with the following code, and how can you fix it?

```
eggs == 3
if eggs = 5:
    print('spam')
else:
    print('not spam')
```

**A:** *assignment (=) and equality (==) have been mixed up; correctly:*

```
eggs = 3
if eggs == 5:
    print('spam')
else:
    print('not spam')
```

2. Given the assignment `mylist = [3, ["green", "eggs"], True, "computing"]`, evaluate the following statements and provide: (a) the value the expression evaluates to; and (b) the value of `mylist` after the code statement has been executed. Assume that `mylist` is reassigned to its original value for each sub-question:

(a) `mylist[2]`

**A:** (a) `True`, (b) `[3, ["green", "eggs"], True, "computing"]`

(b) `mylist[3:]`

**A:** (a) `['computing']`, (b) `[3, ["green", "eggs"], True, "computing"]`

(c) `mylist[1][1][: -1]`

**A:** (a) `'egg'`, (b) `[3, ["green", "eggs"], True, "computing"]`

(d) `mylist.append("new item")`

**A:** (a) `None`, (b) `[3, ['green', 'eggs'], True, 'computing', 'new item']`

(e) `mylist.pop()`

**A:** (a) `'computing'`, (b) `[3, ['green', 'eggs'], True]`

3. Rewrite the following code using a `for` loop:

```
count = 0
items = ['eggs', 'spam', 'moreeggs']
while count < len(items):
    print("We need to buy {0}!".format(items[count]))
    count += 1
```

**A:**

```
items = ['eggs', 'spam', 'moreeggs']
for item in items:
    print("We need to buy {0}!".format(item))
```

4. Rewrite the following code using a `while` loop:

```
for i in range(1, 6):
    print("The square of {n} is {nsq}.".format(n=i, nsq=i*i))
```

A:

```
i = 1
while i < 6:
    print("The square of {n} is {nsq}.".format(n=i, nsq=i*i))
    i += 1
```

5. Write a function `num(obj)` that takes a single object `obj` as an argument, and returns `True` if `obj` is an `int` or a `float`, and `False` otherwise. For example:

```
>>> num(22/7)
True
>>> num("1")
False
>>> num(0)
True
>>> num(["blah"])
False
```

A:

```
def num(obj):
    obj_type = type(obj)
    return(obj_type == int or obj_type == float)
```

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#### OPTIONAL EXTENSION QUESTIONS FOR SELF-STUDY

6. The FM frequency for commercial radio in Australia falls in the range 88.0 to 108.0MHz inclusive, at increments of 0.1MHz, and the frequency for a given radio station is represented as a value in that range with strictly one decimal place (e.g. 105.9 or 103.5). Write a function `valid_fm(val)` that takes a single string argument (`val`), and returns a `bool` evaluation of whether `val` is a valid FM frequency for a radio station or not. For example:

```
>>> valid_fm("107.5")
True
>>> valid_fm("107")
False
>>> valid_fm("107.51")
False
>>> valid_fm("007.5")
False
>>> valid_fm("blah")
False
```

A:

```
def valid_fm(val):
    return(len(val) >= 4 and val[-1].isdigit() and val[-2] == "." \
           and val[:-2].isdigit() and 88.0 <= float(val) <= 108.0)
```

7. Write a function `sum_multiples` that returns the sum of all the multiples of 3 or 5 between 1 and 999 inclusive (Problem 1 of Project Euler)

**A:**

```
def sum_multiples():  
    sum = 0  
    for i in range(1,1000):  
        if not i % 3 or not i % 5:  
            sum += i  
    return(sum)
```