COMP10001 Foundations of Computing
Semester 2, 2016

Tutorial Questions: Week 3

1. Assuming `i = 1`, `f = 2.0`, `s = "3"` and `t = "b4"` evaluate the following code snippets:

   - `i + f`

     A:

     ```
     3.0
     ```

   - `str(i) + s`

     A:

     ```
     "13"
     ```

   - `int(f) + int(s)`

     A:

     ```
     5
     ```

   - `float(t[-1]) * i`

     A:

     ```
     4.0
     ```

2. What is the printed output of the following code snippets:

   - `print("{} was a racehorse, {} was one too".format(11, 22))`

     A:

     ```
     11 was a racehorse, 22 was one too
     ```

   - `print("One day {0} won a race, and {1} won one too".format(11, 22))`

     A:

     ```
     One day 11 won a race, and 22 won one too.
     ```

   - `print("One day {h1} won a race, and {h2} won one too".format(h1=11, h2=22))`

     A:

     ```
     One day 11 won a race, and 22 won one too.
     ```

   - `print("pi = {0:.5f} != {1:.5f}".format(3.141592653, 22/7))`

     A:

     ```
     pi = 3.14159 != 3.14286
     ```

   - `print("n = {0:10.1f} != {1:10.5f}".format(12.3456, 12.3456))`

     A:

     ```
     n =       12.3 !=   12.34560
     ```

3. Given `num` containing an `int`, write a single-line program to calculate the number of digits in it.

   A:

   ```
   len(str(num))
   ```

   OR, if worried about negative values:

   A:

   ```
   len(str(abs(num)))
   ```

4. What is wrong with this code? How can you fix it?

```
letter = input("please enter a letter: ")
if letter == 'a' or 'e' or 'i' or 'o' or 'u':
    print("vowel")
else:
    print("consonant")
```

A: *The issue is with the logic in the test in the `if` statement — it will run just fine, but the semantics is "run this code if any of the following are true: `letter` is 'a' OR `'e'` is a non-empty string OR ... Because `'e'` is, of course, a non-empty string, the test will always succeed, irrespective of the value of `letter`.*
Correctly:

```
if letter == 'a' or letter == 'e' or letter == 'i' or \
letter == 'o' or letter == 'u':
```

or cleaner again:

```
if letter in 'aeiou':
```

5. Assuming `a=1`, `b=2` and `c=3.0`, evaluate the following code snippets:

   - `a + b / c`

     A:

     ```
     1.6666666666666665
     ```

   - `(a + b) / c`

     A:

     ```
     1.0
     ```

   - `b // int(c)`

     A:

     ```
     0
     ```

   - `bool(d and not b or a)`

     A: *A: True*

   - `bool((d and not b) or a)`

     A: *A: True*

   - `bool(d and not (b or a))`

     A: *A: False*

6. Assuming `s="internationalization"`, evaluate the following code snippets:

   - `s[1]`

     A:

     ```
     'n'
     ```

   - `s[:-1]`

     A:

     ```
     'internationalizatio'
     ```

   - `s[:6] + s[11:13]`

     A:

     ```
     'internal'
     ```

   - `s[25]`

     A:

     ```
     IndexError: string index out of range
     ```

   - `s[::-1]`

     A:

     ```
     'noitazilanoitanretni'
     ```

   - `s[:25]`

     A:

     ```
     'internationalization'
     ```