COMP10001 Foundations of Computing
Semester 1, 2020

Tutorial Questions: Week 4

— VERSION: 1654, DATE: MARCH 18, 2020 —

Discussion

1. What is "Boolean"? What values does it store? Can other types be converted to it?
2. For each of the following, identify whether it is: (a) a Boolean value; (b) a relational operator; or (c) a logical operator.

`==`		`>`		`False`	
`!=`		`and`		`<=`	
`or`		`>=`		`not`	
`True`		`<`			

3. How do we use an if statement? What are the variants? How do we know what is contained inside it and what is after?

   Now try Exercises 1–4

4. What is a "Sequence"? What sequences have we seen so far?
5. What is indexing? How can you do it?
6. What is slicing? How can you do it?
7. **Bonus question:** How do you change the "step size" of a slice?

   Now try Exercise 5

8. What is a "function"? How do we call (use) one? How do we define one ourselves?
9. What does it mean to "return" a value from a function and why would we want to? Does a function always need a return value?
10. Why are functions so useful? Could we live without functions?
11. Why are brackets important when calling a function? Are they needed even if it takes no arguments?

    Now try Exercise 6

Exercises

1. Evaluate the following truth expressions:

   (a) `True or False`

   (b) `True and False`

   (c) `False and not False or True`

   (d) `False and (not False or True)`

2. For each of the following if statements, give an example of a value for `var` which will trigger it and one which will not.

   (a)
   ```
   if 10 > var >= 5:
   ```
   (b)
   ```
   if var in ["VIC", "NSW", "ACT"]:
   ```
   (c)
   ```
   if var[0] == "A"and var[-1] == "e":
   ```
   (d)
   ```
   if var:
   ```

3. What's wrong with this code? How can you fix it?

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

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

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

5. Evaluate the following given the assignment `s = "pythonisation"`

   (a) `s[1]`
   (b) `s[-1]`
   (c) `s[2:4] + s[6:8]`
   (d) `s[25]`
   (e) `s[25:]`
   (f) `s[-7:-3]`
   (g) `s[:-3]`
   (h) `s[::2]`
   (i) `s[::-1]`

6. What's wrong with this code? How can you fix it?

```
def calc(n1, n2):
    answer = n1 + (n1 * n2)
    print(answer)

num = int(input("Enter the second number: "))
result = calc(2, num)
print("The result is:", result)
```

Problems

1. Write a program which asks the user for two numbers and an operator out of `+`, `-`, `/` and `*` and performs that operation on the two numbers, printing the result.
2. Write a function which takes a string as a single argument, and returns a shortened version of the string consisting of its first three letters and then every second letter in the rest of the word.
3. Write a function which takes a sentence as a single argument (in the form of a string), and evaluates whether it is valid based on whether the first letter is capitalised and the last character is a full stop. Return a Boolean value True or False.