Loop Practice

Introduction to Computer Programming

Dr. Paul Vrbik

October 3, 2018

Question (Final 2016 Q1)

What is printed when the following is executed?

```
def add(x, y):
    print('Adding', x, y)
    return x + y

def double(z):
    print('Doubling', z)
    return 2*z

if add(20, double(10)) > 0 and add(-25, double(5)) > 0:
    print('Yay!')
else:
    print('Oops!', add(double(3), 0))
```

Question

Write a function with the following signature.

```
def from_binary( bits:str ) -> int:
    """Return the base-ten (decimal) value of the
    binary number represented by bits.
    >>> from_binary("101")
    5
    >>> from_binary("1100")
    12
    >>> from_binary("0")
    0
    """
```

Question

Write a function with the following signature.

```
def contains_digits( cs:str ) -> bool:
    """Returns True only when cs has a digit.
    >>> contains_digits("one two three")
    False
    >>> contains_digits("one 2 three")
    True
    """
```

Question

Write a function with the following signature.

```
def only_vowels( cs:str ) -> bool:
    """Returns True only when cs is comprised of
    vowels (a, e, i, o, u) only.
    >>> only_vowels("vrbik")
    False
    >>> only_vowels("euouae")
    True
    """
```

Question (Final 2016 Q3)

Complete the following.

```
def valid_password( pw:str ) -> bool:
    """Returns True iff pw is a valid password.
    A valid password must
      1/ be exactly 8 characters,
    and contain at least one
      2/ upper case letter,
      3/ lower case letter,
      4/ digit
      5/ !, #, \%, or *.
    """
```

Question

Write a function with the following signature.

```
def repeat_character( cs:str, k:int ) -> str:
    """Returns cs with each character repeated
    k-times.
    >>> repeat_character("vrbik", 2)
    'vvrrbbiikk'
    >>> repeat_character("Hello Wolrd", 2)
    'HHeellllloo  WWoollrrdd'
    """
```

Question

The goodness of a string `cs` is 0 if `cs` contains any characters asides 0 or 1. Otherwise `cs`'s goodness is given by the number of 1's in the string.

Implement a function `goodness(s:str) -> int:` that calculates a strings goodness.

Question (Final 2016 Q1)

Complete the following

```
deg zigzagzip(s1:str, s2:str) -> str:
    """Returns a string comprised of alternating
    letters from s1 and s2.
    ASSUMES: len(s1) == len(s2)

    >>> zigzagzig('abc', '123')
    'a2c'
    >>> zigzagzig('abcd', '1234')
    'a2c4'
    """
```

Question

Write a function to check if a string is a palindrome (i.e. a word which is the same as its reverse).

Question

Write a function that takes as input `cs:str` and a character `c:str` and returns the rightmost position of `c` in `cs`. If `c not in cs` then return -1.

Do not use the built-in `find`.

Question (Exam 2017 Q4.a)

Complete the body of the following function.

```
def seperate_and_reverse( cs:str ) -> (str, str):
    """Returns two strings.
    The first string contains all the vowels in reverse
      order of appearance.
    The second collects the remaining non-vowels into a
      string in order.

    >>> seperate_and_reverse("Catherine wants to go to the ZOO.")
    ('OOeoooaeiea', 'Cthrn wnts t g t the Z.')

    >>> seperate_and_reverse(' 108!!!')
    ('', '108!!!')
    """
```