



Polytechnic Tutoring Center

Final Exam Review ANSWER KEY- CS 1113, Fall 2021

Disclaimer: This mock exam is only for practice. It was made by tutors in the Polytechnic Tutoring Center and is not representative of the actual exam given by the CS Department.

1. Indicate whether the Python types below are mutable or non-mutable by circling either...

Lists	mutable	non-mutable
Strings	mutable	non-mutable
Dictionaries	mutable	non-mutable
Integers	mutable	non-mutable
Tuples	mutable	non-mutable

2. Define a function which recursively prints out a right triangle, given the number of rows to print out and the type of character to print on each line. For example, if I call the function (say the name of my function is `display_triangle`, then `display_triangle(5, "*")` should print...

```
*
**
***
****
*****
```

```
def display_triangle(num, char):
    if num == 1:
        print(1 * char)
    else:
        display_triangle(num - 1, char)
        print(num * char)
```

3. Write a function which converts an integer n into a string which represents its binary number, note the string should go from most significant to least significant digit.

```
def convert_to_binary(num):  
    acc = ""  
    while (num != 0):  
        acc = str(num % 2) + acc  
        num //= 2  
    return acc
```

4. Create the following lists using list comprehension.

a. `lst1 = [1,2,2,3,3,3,4,4,4,4,5,5,5,5]`

`[i for i in range(1,6) for j in range(i)]`

b. `lst2 = [0, -1, 2, -3, 4, -5, 6, -7, 8]`

`[i * ((-1) ** i) for i in range(9)]`

5. What is the output of the following code?

```
def func1(x):  
    for i in range(x, 0, -2):  
        print(i**2, end = ' ')  
    print()
```

```
def func2(x):  
    while x > 1:  
        x//=2  
        func1(x)  
    return lst
```

```
y = 10  
func2(y)
```

```
25 9 1  
4  
1
```

6. This question will be based entirely off the following code...

```
s = 'the 167 20 lazy 210 brown 78 87 2 fox 245 123'  
lst = s.split()  
acc = 0  
for elem in lst:  
    acc += int(elem)  
print(acc)
```

(a) Why does this code not work? **Can't convert a string to an int**

(b) What type of error does it give? **ValueError**

(c) Can you fix it using a try/except block? Write the code to fix it.

Inside the for loop...

```
for elem in lst:  
    try:  
        acc += int(elem)  
    except ValueError:  
        print("Value Error detected!!!")  
  
print(acc)
```

7. This is going to be a simple guessing game where the computer will generate a random number between 1 to 10, and the user has to guess it in 5 attempts. After that, the user loses.

Based on the user's guess computer will give various hints if the number is high or low. When the user guess matches the number computer will print the answer along with the number of attempts.

This is how the game looks in action.

```
Hello, What's your username? PTCnumber1
okay! PTCnumber1. I am guessing a number between 1 and 10:
2
Your guess is too low
4
Your guess is too low
6
You guessed the number in 3 tries!

-----

Hello, What's your username? PTCnumber2
okay! PTCnumber2. I am guessing a number between 1 and 10:
1
Your guess is too low
2
Your guess is too low
3
Your guess is too low
4
Your guess is too low
5
Your guess is too low
'You did not guess the number. The number was 6.
```

```
-----  
import random  
number = random.randint(1, 10)  
  
player_name = input("Hello, What's your username?")  
print('okay! ' + player_name + ' I am guessing a number between 1 and 10:')  
  
number_of_guesses = 0  
guess = 0  
while number_of_guesses < 5 and guess != number:  
    guess = int(input())  
    number_of_guesses += 1  
    if guess < number:  
        print('Your guess is too low')  
    elif guess > number:  
        print('Your guess is too high')  
if guess == number:  
    print('You guessed the number in ' + str(number_of_guesses) + ' tries!')  
else:  
    print('You did not guess the number. The number was ' + str(number))
```