

# BRAC University

## Department of Computer Science and Engineering

### CSE110: Programming Language I

Examination: Quiz #3

Date: 17 / 08 / 2022

Semester: Summer 2022

Time: 40 Minutes

ID: _____	Name:  (Please write in <b>CAPITAL LETTERS</b> )	Obtained Points:  / 20	Section:  29
--------------	--	------------------------------	--------------------

- Read questions carefully.
- Understanding the question is part of the exam, please do not ask questions.

1. Although Wanda Maximoff tried to erase all the copies of Darkhold once she realized its negative effects, there were a few versions of it left in some universes which she could not. It didn't take long for Doctor Strange to feel its presence, however, he is currently occupied with a bug-themed Ant-Man at Quantamania and cannot travel through the multiverse to destroy the remaining Darkholds at the moment. Therefore, he is looking for an expert in String Manipulation who can create an encryption-based locker to lock it from every multiverse - for safety. Being a graduate of BRAC University - one of the most prestigious global universities - you are the chosen ONE!

You will be traveling with Ms. America Chavez - the multiversal traveler. This is an amazing opportunity for you and since you are amazing at programming, you are building a machine that will generate encryption keys for five universes at each runtime. The machine will run a Python program that will have a function - `encrypt_darkhold(...)` - which will take the **universe\_number** and **universe\_name** as arguments. Before leaving, Strange told you the range of universes that might have the Darkhold:  $110 \leq \text{universe\_number} \leq 221$ . In addition to that, if the **encryption\_key** contains any non-alphanumeric character then that universe does not have Darkhold - he did not reveal why but you trust him. So, your machine will display the encryption key for only those universes that has it otherwise will display "This universe does not have any Darkholds."

In the function, for each character in the **universe\_name**, one digit from the **universe\_number** starting from the right in a circular pattern is added to the ASCII of that character. The explanation for the **first** and **fourth** universe from the sample input/ output is given below.

M	o	h	a	k	h	a	l	i	universe_name	Z	u	l	f	i	k	a	r
77	111	104	97	107	104	97	108	105	ascii	90	117	108	102	105	107	97	114
0	1	1	0	1	1	0	1	1	universe_num	0	5	1	0	5	1	0	5
77	112	105	97	108	105	97	109	106	new_ascii	90	122	109	102	110	108	97	119
M	p	i	a	l	i	a	m	j	encrypt_key	Z	z	m	f	n	l	a	w

Since you only have **25 minutes** to complete your work and get **12 marks** (or respect) from America Chavez, the work has been partially done for you which you are not allowed to change. [ **CO1, CO3, CO4, CO6** ] ( **12 Marks** )

```
# Write and design the encrypt_darkhold(...) function here.

universe = {}
passwords = {}

for i in range(5):
    k, v = input().split()
    universe[int(k)] = v

for num, name in universe.items():
    # Replace pass to store the encryption key of universes with
    # respect to universe number as key in the passwords dictionary.
    pass

print("Passwords for next 5 universes:")

for num, key in passwords.items():
    print(f" Universe #{num}: {key}")
```

Sample Input	Sample Output
110 Mohakhali 331 Gulshan 220 Dhaka 150 Zulfikar 170 Mymensingh	Passwords for next 5 universes: Universe #110: Mpialiamj Universe #331: This universe does not have any Darkhold. Universe #220: Djckc Universe #150: Zzmfnlaw Universe #170: This universe does not have any Darkhold.

2. Answer any of the two questions below, both for the bonus. ( **8 Marks** - each )

**Note:** Bonus will be given if at least one question is answered correctly. Otherwise, the highest number obtained will be considered and no bonus will be given.

- a. Write a Python program that will first read a sentence (without a full stop) from the user and then read a list of special characters that are separated by a space. Next, create a dictionary where the key will be special characters and the value is a list of words from the sentence. The values will be added in order and the keys are selected from the first special character one by one in a circular pattern. Finally, print the created dictionary. [ **CO3, CO4, CO6** ]

Sample Input	Sample Output
The quick brown fox jumps \$ @	{'\$': ['The', 'brown', 'jumps'], '@': ['quick', 'fox']}
over the lazy dog	{'\$': ['over', 'dog'], '!': ['the'], '%': ['lazy']}

\$!%	
------	--

- b. Before you started quiz 3 today, you asked for help from your friend who is very good at Python programming, especially in tracing. because you must get full marks on this quiz to keep your academic performance buoyant. He agreed to help you on the condition that you must trace the following Python code and get the correct output within the next **15 minutes**. [ CO3, CO4, CO6 ]

1	<code>a = [{}, {}]</code>
2	<code>b, = a[:1]</code>
3	<code>c = [__, __, __, __, __, __, __, __] # Your student ID</code>
4	
5	<code>i = 0</code>
6	<code>while i &lt; len(c):</code>
7	<code>    d = c[i]</code>
8	
9	<code>        key = "EOVDEDN"[d % 2::2]</code>
10	<code>        if key not in a[0]:</code>
11	<code>            a[0][key] = []</code>
12	<code>        b[key].append(d)</code>
13	
14	<code>        i += 1</code>
15	
16	<code>for k, v in b.items():</code>
17	<code>    print(k)</code>
18	<code>        for i in v:</code>
19	<code>            print(i)</code>
20	<code>    print("====")</code>