Week 6: Assignment 6

The due date for submitting this assignment has passed.

Due on 2024-09-04, 23:59 IST.

Assignment submitted on 2024-08-24, 13:08 IST

1) If n is a positive integer, what is the output of the function given input n, ***1 point***

```
def mystery(n):
    if n <= 0:
        return 0
    else:
        return 1 + mystery(n - 1)
```

- Sum of numbers from 1 to n
- Sum of numbers from 1 to n-1
- n-1
- n

Yes, the answer is correct.
Score: 1

Accepted Answers:
n

2) Which of the following are true about recursion? ***1 point***

- [x] Recursion is a process in which a function calls itself as a subroutine.
- [ ] Recursion is a better alternative for performing repetitive tasks compared to iteration.

☑ Recursion requires more resources compared to iteration.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Recursion is a process in which a function calls itself as a subroutine.
Recursion requires more resources compared to iteration.

3) What is the output of following code ? ***1 point***

```
def func(x):
    return x * 2

def func(x, y=3):
    return x + y

print(func(5))
```

- ○ 10
- ◉ 8
- ○ 5
- ○ Error

Yes, the answer is correct.
Score: 1

Accepted Answers:
8

4) The letter 'e' is the most frequently occurring letter in the English language. ***1 point***
Suppose we apply a Substitution Cipher where 'e' is mapped to 'a', and all other letters are uniquely mapped to different letters. If we encrypt a very long English storybook using this cipher, will the frequency of 'a' be the highest in the encrypted text?

Hint: Search the internet for more info, if needed

- ○ Yes, it would be same as ’e’ in the original text
- ○ Yes, it would be higher than ’e’ in the original text.
- ◉ No, it would be lower than ’e’ in the original text.
- ○ No, we cannot predict

No, the answer is incorrect.
Score: 0

Accepted Answers:
Yes, it would be same as ’e’ in the original text

5) Could we check frequency of letters in a long ciphertext and map them to frequency ***1 point***
of letters in English to decrypt the message?

Hint: Search the internet for more info, if needed.

- (•) Yes, it is possible.
- ( ) No, it is not possible.

Yes, the answer is correct.
Score: 1

Accepted Answers:
Yes, it is possible.

6) What are drawbacks of using frequency analysis to decrypt a message that has been encrypted using Substitution Cipher? ***1 point***

- [ ] It will not work if the cipher text is too small.
- [ ] It works flawlessly.
- [x] It will not work if the encrypted text was previously encrypted using a different cipher, which could have removed patterns in common English.
- [x] The frequency analysis method doesn't work at all for Substitution Cipher

No, the answer is incorrect.
Score: 0

Accepted Answers:
It will not work if the cipher text is too small.
It will not work if the encrypted text was previously encrypted using a different cipher, which could have removed patterns in common English.

7) If variable **dict_name** is a non-empty dictionary, what does dict_name.keys() return? ***1 point***

- ( ) Returns nothing, but prints all the keys in the dictionary.
- (•) Returns a list of all the keys in the dictionary.
- ( ) Returns a list of all the values in the dictionary.
- ( ) Returns a list of all the items in the dictionary

Yes, the answer is correct.
Score: 1

Accepted Answers:
Returns a list of all the keys in the dictionary.

8) Is Ceaser Cipher a type of Substitution Cipher? ***1 point***

- (•) Yes
- ( ) No

Yes, the answer is correct.
Score: 1

Accepted Answers:
Yes

9) What is the consequence of not having a base case in a recursive function? ***1 point***

- (•) The function will run infinitely.
- ( ) The function will run only once.
- ( ) The function will not run at all.

The function will run only for a fixed number of times.

Yes, the answer is correct.
Score: 1

Accepted Answers:
The function will run infinitely.

10) What are the number of possible final lines when someone wins, in a game of TicTac-Toe? ***1 point***

- 3
- 8
- 9
- 4

Yes, the answer is correct.
Score: 1

Accepted Answers:
8