CSCI 1200 Midterm1 (post review)

By: Dr. Ming Ming Tan.

Question 1a

Consider the following function.

```
def floor_square_diff(x,y):
  return (x**2-y**2)//2
```

What is the value of `floor_square_diff(5,3)`?

Question 1b

Complete the following function `floor_mean_square_diff` that takes two numbers `x` and `y` and returns the value $\lfloor \frac{\sqrt{x^2-y^2}}{2} \rfloor$.

```
def floor_mean_square_diff(x,y):


```

Question 2a

Assume an `int` variable named `num` is already initialized to some value.
Which of the following values of `num` will result in `num%3==0 or num%7==0` be evaluated to `True`?
Select all that apply.

- ☐ 35
- ☐ 9
- ☐ 21
- ☐ 15

Question 2b

Assume an `int` variable named `num` is already initialized to some value.
Write a statement that will evaluate to `True` only if `num` is not divisible by 10 and is not divisible by 2.

```

```

Question 3a

Consider the following function.

```
def test(n):
  if n<0 or n>100:
    return -1
  elif n<50:
    return n/2
  else:
    return (n-50)/2
```

What is the output of:
(i) `test(-1)`
(ii) `test(49)`
(iii) `test(50)`
(iv) `test(51)`
(v) `test(100)`
(vi) `test(101)`

Question 3b

Complete the following function `leaky_relu` that takes a parameter `x` (a number) as input and returns the $0.01x$ `x` if is negative else returns `x`.

```
def leaky_relu(x):
```

Question 4a

Consider the following function `test` that takes a string `text` as input:

```
def test(text):
  if text[0]==text[-1]:
    return text[:-1]
  else:
    return text
```

(i) What is the value of `test("aba")`?
(ii) What is the value of `test("ab")`?
(iii) What is the value of `test("abca")`?

Question 4b

Complete the following function `pluralize` that takes a string `text` as input and does the following:

- if `text` ends with `"s"` or `"o"`, add `"es"` to the end of `text` and return the resulted string,
- if `text` ends with “y”, add “ies” to the end of `text` and return the resulted string,
- otherwise, add `"s"` to the end of `text` and return the resulted string.

For examples,
`pluralize("potato")` should return `"potatoes"`
`pluralize("bus")` should return `"buses"`
`pluralize("city")` should return `"cities"`
`pluralize("cat")` should return `"cats"`

```
def pluralize(text):
```

Question 5a

Consider the following program:

```
password = ""
while (len(password)<12 and len(password)%2==0):
  password = input("Enter a new password")
```

In this program, the user will be prompted to make an input. Choose all that apply.

☐ (a) If user's input is "123456123456", the loop will terminate.
☐ (b) If user's input is "12345612345", the loop will terminate.
☐ (c) If user's input is "1234561234567", the loop will terminate.
☐ (d) This program can be rewritten using a for loop.

Question 5b

Consider the following function

```
def test(text):
  for i in range(len(text)):
    if text[i]!=text[i-1]:
      return False
  return True
```

What is the output of `test("aa")`? If there is an error, explain in detail what the error is.

Bonus Question (OPTIONAL)

Complete the following function `sumDigits` that takes an input string `text` that contains characters from “0” to “9” and “A” to “F”.
Each such character represents a number.

- “0” represents 0, “1” represents 1, ..., “9” represents 9
- “A” represets 10, “B” represents 11, ..., “F” represents 15.

The function should return the sum of all numbers represented by each character in `text`.
For example:
`sumDigits("124A")` should return 1+2+4+10 which is 17.
You may use the function `int` ,`ord`, `chr` and the operator `in`, but NOT other method such as `isdigit()` etc.

```
def sumDigits(text):
```

Bonus Question : Verify Check Digit (Optional)

Complete the following function `verifyCheckDigits` that takes an input string `text` and an integer `check_digit`. The string `text` contains characters from “0” to “9” and “A” to “F”.

Each such character represents a number.
- “0” represents 0, “1” represents 1, ..., “9” represents 9
- “A” represets 10, “B” represents 11, ..., “F” represents 15.

The function should return `True` if the sum of all numbers represented by each character in `text` is equal to `check_digit`, else return `False`.
For example:
`verifyCheckDigit("124A", 17)` should return `True` since the sum of all numbers represented by `"124A"` is 1+2+4+10 which is 17.
You may use the function `int` ,`ord`, `chr` and the operator `in`, but NOT other method such as `isdigit()` etc.

```
def verifyCheckDigit(text, check_digit):
```