ENF1170 - Group8 - Midterm

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Question 1 (15 points)

Please write the output of the following scripts

```
x = 13
while x > 1:
    if x % 2 == 0: x= x/2
    elif True: x= 3*x+1
    else: x= 0
print(x)
```

Output:

```
n=1234
count = 0
for i in range(10):
    if n == 0 and count > 0:
        break
    count += 1
    n = n // 10
print(count)
```

Output:

```
not( (-0.2 > 1.4) and
     ((0.8 < 3.1) or (0.1 == 0.1)) )
```

Output:

Question 2 (5 points)

We are trying to calculate mean value of odd numbers between 1 and 100. A sample code is given below, which has an indendation error. Please fix the error (**Mark the line(s)** and then indicate if they should be indented to **Right** or **Left**)

```
sum=0
count=0
for x in range(1,100,2):
    count += 1
sum += x
mean=sum/count
print("Mean is:", mean)
```

Question 3 (15 points)

Rule for Ackermann function is given as:

$$A(m,n) = \begin{cases} n+1 & \text{if } m = 0 \\ A(m-1,1) & \text{if } m > 0 \text{ and } n = 0 \\ A(m-1, A(m,n-1)) & \text{if } m > 0 \text{ and } n > 0. \end{cases}$$

Please write a Python function for Ackermann function.

Question 4 (15 points)

For the given sentence please **write down the output** of list comprehension statements

```
sent = "This is a Title Case Sentence."
```

A.

```
[x[-1] for x in sent.split()]
```

Output:

B.

```
[sent[x].lower() for x in range(0,len(sent),3)]
```

Output:

C.

```
[len(x.replace(".","")) for x in sent.split()]
```

Output:

Question 5 (5 points)

We discussed `Fib()` function in class during recursion topic. In `Fib(6)`, how many times `Fib(2)` is called? **Draw** simple tree and **mark** `Fib(2)` on the tree.

Question 6 (10 points)

The partial code below prints a half pyramid as shown. Please fill in the blanks in the code.

```
rows=5
for i in range( rows , ____ , ____ ):
    for j in range( ____ , ____ ):
        print("*", end=' ')
    print("")
```

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

Question 7 (10 points)

Write a program which will get a number from user and then for each integer from 0 (zero) up to user input number, write ;

- integer itself,
- its square,
- and if it's even or not (True/False)'

to a file named "n_square_even.txt". A sample output for *n=5* is provided below: (**Note**: To concatanate different values in single line please use `print(i,",",j)` or `print(i,j, sep=', ')`)

```
0 , 0 , True
1 , 1 , False
2 , 4 , True
3 , 9 , False
4 , 16 , True
5 , 25 , False
```

THIS IS AN EXAMPLE, THE OUTPUT SHOULD BE WRITTEN TO A FILE, NOT TO SCREEN

Question 8 (10 points)

Write a program which inputs a score between 0 and 100 from user then prints a grade using the following table:

```
Score Grade
>= 90 A
>= 80 B
>= 70 C
>= 60 D
< 60 F
```

Question 9 (10 points)

During recitation, almost everybody quickly solved the FizzBuzz question. So, this should be an easy question. Please write a program printing FizzBuzz up to 50. Sample output is given below, please note that **the output should contain the number itself**

```
1
2
3 Fizz
4
5 Buzz
6 Fizz
...
15 FizzBuzz
...
50 Buzz
```

Question 10 (5 points)

What is academic integrity? And, why did the instructor discuss the topic in class?

Question - BONUS-1 (10 points)

Write a program that prints out, in reverse order, every multiple of 3 between 1 and 200.

Question - BONUS-2 (15 points)

Below is the code for number guessing game. Rewrite the code so that if user guesses correct, instead of quitting after *"Congrats!"* message, the program should ask *"Play one more time?(y/n)"* and if user enters Y or y, start the game again, else quit the program.

```
import random
number = random.randint(1,9)
while True:
    guess = int(input("Guess the number: "))
    if guess < number:
        print('Number too low')
    elif guess > number:
        print('Number too high')
    else:
        print('Congrats! You guessed it')
        break
```