IT5001 Quiz 1 Name:_____ Student Number: A_____

Question 1 Expression Evaluations [30 marks]

Evaluate the following terms. If we type them into the shell, what will be the output or echo from IDLE? If any of these causes an error, please write "error" instead. The type of your answer is important, e.g. the integer `5` is different from `'5'` or `5.0`.

Evaluate the Followings:	Answer:
`6 + 5 * 4 / 2 ** 2 - 1`	`10.0`
`not True or False`	`False`
`3*(('b' * 2)+'a')`	`'bbabbabba'`
`(2+1>1)+(--1)*True`	`2`
`('a'+'b')*3 == 'a'*3 + 'b'*3`	`False`
`'I1 2d3iadd tiatb!g'[::2]`	`'I did it!'`

Question 2 Code Tracing [25 marks]

Each piece of code is a separate program/file. What is the output of each of them when we run it? If the code produces errors or runs into an infinite loop, please state 'error' or 'infinite loop' respectively.

Code	Answers:

`def f(x,y,z):`
`  return x+y*z`
`  return 9`
`print(f(1,2,False))`
	`1`

`a = 0`
`while (a < 10):`
`  a += 1`
`print(a)`
	`10`

`def f(x,y):`
`  return x**y`
`print(f(f(1,10),f(100,1000)))`
	`1`

`def f(x):`
`  if x <= 0:`
`  return 0`
`  return f(x/2)`
`print(f(10))`
	`Error`
	`(Exceeded function call stack depth)`

Question 3 Anagram [10+40 marks]

The DNA of any creature can be represented by a string of characters with 'A', 'C', 'G' and 'T', for example, 'AGCTAGTACGTACTGACACGTCA'. And a new scientific discovery shows that if you count a certain character and it exceeds a certain number N, it is connected to some genetic super power! So we would want to you write a function to check if a given DNA has more than n characters of a certain letters. E.g. if we want to check if the letter 'A' or 'C' in a DNA is more than 10, we use the function like this:

```
>>> dna1 = 'AGCTAGTACCGCCTACTGACACGCTCA'
>>> print(checkDNA(dna1,'A',10))
False
>>> print(checkDNA(dna1,'C',10))
True
```

And in this question, you cannot use the "`count()`" function in strings. You can assume the input string consists of the four letters in upper cases only.

Among the three types of loops introduced in the lecture, which type will you use for this problem?

Type C (or 3). Run at most N times

Write the function `checkDNA(dna,letters,N)` for any string of DNA, character and number below. (The grey lines are the help for your indentations.)

```
def checkDNA(dna,letter,n):
    count = 0
    for c in dna:
        if c == letter:
            count += 1
        if count >= n:
            return True
    return False
```