# SECTION A

This section is for **Python**, please answer the questions according to the Python version that we are using in class, namely, version 3.6.0. For the coding questions, you cannot import any other packages. In order to gain full marks, your code **cannot be excessively lengthy**.

## Question 1 [10 marks]

Assume that NO package is imported. If you **type** each of the following into the IDLE shell what will be displayed/returned? Or write "error" if an error occurs
And your answer is right only if it is in the right "format". For example, if the answer is `5`, both `'5'` and `5.0` will be considered *wrong*.

| Evaluate the Followings: | Answer: |
|---|---|
| `print([1,2,3,4].reverse())` | None |
| `print((1,2,3,4).sort())` | Error |
| `True or sqrt(-1)` | True |
| `len(((1,2,3,4,5)))` | 5 |
| `'abcdefghi'[5:99:2]` | 'fh' |
| `not True or True` | True |
| `'a'+'b' * 3` | 'abbb' |
| `sorted('100')` | ['0', '0', '1'] |
| `set([i%3 for i in range(20)])` | {0,1,2} |
| `round(1.99)` | 2 |
| `'I1 2d3iadd tiatb!g'[::2]` | 'I did it!' |

## Question 2 [15 marks]

Each row of the table is a separate program/file. What is the output of each of them? If the code produces errors or runs into infinite loops, please state 'error' or 'infinite loop' respectively.

| Code | Output |
|---|---|
| `a = 1`<br>`print( a + (--a))` | `2` |
| `a = 0.0`<br>`while (a != 1.0):`<br>`  a += 0.1`<br>`print(a)` | `Infinite loop` |
| `a,b,c = 1,2,3`<br>`a,b,c = b,c,a`<br>`a,b,c = c,b,a`<br>`print(str(a)+str(b)+str(c))` | `132` |
| `L = list('1007')`<br>`sorted(L)`<br>`print(L)` | `['1', '0', '0', '7']` |
| `x = 0`<br>`def incX(n):`<br>`  for i in range(n):`<br>`  x = x + i`<br>`incX(5)`<br>`print(x)` | `Error` |

## Question 3 [10 marks]

You are given a dictionary of grades and grade points below:

```
grade2point = {'A':5, 'A-':4.5, 'B+':4, 'B':3.5, 'B-':3, 'C+':2.5,
'C':2, 'D+':1.5, 'D':1, 'F':0}
```

Write a function **`calculateCAP(L,grade2point)`** to take in a list **`L`** of grades (a list of strings) and **return** the CAP value by using the dictionary. Here are some sample outputs:

```
>>> grade2Point = {'A': 5, 'A-': 4.5, 'B+': 4, 'B': 3.5,
                   'B-': 3, 'C+': 2.5, 'C': 2, 'D+': 1.5, 'D': 1, 'F': 0}
>>> johnGrades = ('A', 'B+', 'C', 'A', 'A-')
>>> print(calculateCAP(johnGrades,grade2Point))
4.1
>>> maryGrades = ('A', 'A', 'B+', 'B-', 'A-', 'B', 'A', 'C+', 'B+', 'B')
>>> print(calculateCAP(maryGrades,grade2Point))
4.0
```

You can assume the list **`L`** is not empty and only contains the keys in the **`grade2point`** dictionary.

```
def calculateCAP(L,gradeDict):
    total = 0.0
    for i in L:
        total += gradeDict[i]
    return total/len(L)
```

## Question 4 [15 marks]: Checking if a number is Fibonacci

Mr. Silly is writing a function in Python to check if a number *n* is a Fibonacci number. He is given a ready-made correct function **`fib(i)`** that gives him the $i^{th}$ Fibonacci number. He wrote the code and it is shown on the right side. And it should return **`True`** if **`n`** is a Fibonacci number and **`False`** otherwise. However, the code seems to be buggy.

```
def isfib(n):
    i = 1
    f_i = fib(i)
    while (f_i <= n):
        if n == f_i:
            return True
        else:
            return False
        i+=1
        f_i = fib(i)
```

a) Please give an example that the function will tell a wrong answer

Any true fib number > 1 return False

Good answer: 5
Ok answer :3

b) Correct his code with minimal changes below. You must follow his code as much as possible and keep the first three lines the same in the function body.

```
def isfib(n):
    i = 1
    f_i = fib(i)
    while (f_i <= n):
        if n == f_i:
            return True
        i+=1
        f_i = fib(i)
    return False
```