

1. **Complexity** What is the complexity of the following functions? Write the complexity for each function separately in the column to the right, as a function of  $n$  where  $n$  is the length of list passed to each function. Write a short explanation of your answer

(a) (5 points)

```
def f0(a):  
    t = 0  
    for e in a:  
        for t in a:  
            t = t + 1
```

$O(\quad)$

Explain:

(b) (5 points)

```
def f1(a):  
    k = len(a)  
    a = a * len(a)  
    n = len(a)  
    sum = 0  
    for i in range(k-1, -1, -1):  
        j = 1  
        while j < n:  
            sum += a[i]  
            j = j + 1  
    return sum
```

$O(\quad)$

Explain:

(c) (5 points)

```
def f2(a):  
    n = len(a)  
    total = 0  
    for i in range(n/2):  
        total += f1(a) #call to function f1 from previous task  
    print (total, "what's going on?")
```

$O(\quad)$

Explain:

(d) (5 points)

```
def f3(a):  
    n = len(a)  
    y = n  
    a = 0  
    for i in range(y * n):  
        for j in range(2*n):  
            a = a + 1
```

$O(\quad)$

Explain:

(e) (5 points)

```
def f4(a):  
    for i in a:  
        n = len(a)  
        while n > 0:  
            print (a[n-1])  
            n = n // 2
```

$O(\quad)$

Explain:

(f) (5 points)

```
def f5(a):  
    n = len(a)  
    for i in range(len(a)):  
        while (n > 0):  
            print (n)  
            n = n - 1
```

$O(\quad)$

Explain:

(g) (5 points)

```
def f6(a):  
    n = len(a)  
    for i in range(n):  
        for j in range(200):  
            f0(range(n)) #calling function f0 from task 1.
```

$O(\quad)$

Explain: