LAB 06

SUBMISSION INSTRUCTIONS

Type/write your answers on the document and submit it as a pdf file with the name JaneDoe.pdf (replace JaneDoe with your first and last name respectively).

QUESTIONS

1. (10pts): What is the Big O notation of the expressions below:
   a. $O(n + n + 9999)$
      Ans: $O(n)$
   b. $O((n^3 + 3) * (n + 5))$
      Ans: $O(n^4)$
   c. $O(12n + 6n^3 + 1000)$
      Ans: $O(n^3)$
   d. $2n^3 + O(n^2)$
      Ans: $O(n^5)$
   e. $\log_2 n + 2 + \log_5 n$
      Ans: $O(\log n)$

2. (20pts): What is the time complexity of the functions below?

	Code	Time complexity
a)	```def test(n): for i in range(n): for j in range(n): print(i, j)```	$O(n^2)$
b)	```def test(n): for i in range(n): print(i) for j in range(n): print(j)```	$O(n)$
c)	```def test(x, y): for i in range(x): print(i) for j in range(y): print(j)```	$O(x+y)$
d)	```def test(n): i = n while i > 0: i = i - 2 print(i)```	$O(n)$
e)	```def test(n, m): for i in range(m): for j in range(m): k = n while k > 0: k = k - 2 print(i, j, k)```	$O(m^2*n)$
f)	```def test(n): ans = n + 1 return ans```	$O(1)$

| g) | ```python
def test(n):
    for i in range(n):
        print(i)

    for i in range(n):
        for j in range(n):
            for k in range(n):
                print(i, j, k)
``` | $O(n^3)$ |
| h) | ```python
def test(n):
    for i in range(0, 100, n):
        print(i)
``` | $O(1)$ |
| i) | ```python
def test(n):
    for i in range(0, n):
        k = 1
        while k < n:
            k = k * 2
            print(i, k)
``` | $O(n \log n)$ |
| j) | ```python
def test(n):
    for i in range(0, n):
        k = 1
        while k < n:
            k = k * 2
            print(i, k)

    for i in range(0, n):
        for j in range(0, n):
            for k in range(0, n):
                print(i, j, k)
``` | $O(n^3)$ |