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. (6pts): Which Big O notation is equivalent to:
   a. O(n + 9999)
      $O(n)$
   b. O(734n)
      $O(n)$
   c. O(12n +6n^3 + 1000)
      $O(n^3)$

2. (4pts): Determine the simplified Big O notation.
   a. 2n^3+ O(n^2)
      $O(n^5)$
   b. $\log_2 n$
      $O(\log n)$

3. (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)`
		$O(\log n)$

e)	`def test(n):`
	`  for i in range(n):`
	`  for j in range(n):`
	`  for k in range(n):`
	`  print(i, j, k)`
		$O(n^3)$

f)	`def test(n):`
	`  ans = n + 1`
	`  return ans`
		$O(1)$

g)	`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)	`def test(n):`
	`  for i in range(0, n, 5):`
	`  print(i)`
		$O(n)$

i)	`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)	`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)`
		$O(n^3)$