# CS101A-计算机导论-Assignment 3

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**Ex.1**

(A) True

(B) True

**Ex.2**

4

1.Well-defined, 2.Unambiguous steps, 3.Produce a result, 4.Terminate in a finite time

**Ex.3**

3

1.Flow charts, 2.Primitives, 3. Pseudo-code

**Ex.4**

$log(log\ n) < 2n < 8n^3 + 17n^2 < (1.5)^n$

solution:

- for $log(log\ n) \leq c_1 \cdot log\ n$, there are constants $c_1 = 1, c_2 = 1$ such that $log(log\ n) \leq log\ n$ holds for all $n \geq c_2$, so $log(log\ n) = O(log\ n)$
- for $2n \leq c_1 \cdot n$, there are constants $c_1 = 3, c_2 = 1$ such that $2n \leq c_1 \cdot n$ holds for all $n \geq c_2$, so $2n = O(n)$
- for $8n^3 + 17n^2 \leq c_1 \cdot n^3$, there are constants $c_1 = 9, c_2 = 17$ such that $8n^3 + 17n^2 \leq c_1 \cdot n^3$ holds for all $n \geq c_2$, so $8n^3 + 17n^2 = O(n^3)$
- for $(1.5)^n \leq c_1 \cdot 2^n$, there are constants $c_1 = 1, c_2 = 1$ such that $(1.5)^n \leq c_1 \cdot 2^n$ holds for all $n \geq c_2$, so $(1.5)^n = O(2^n)$

Therefore, $log(log\ n) < 2n < 8n^3 + 17n^2 < (1.5)^n$