CSCI 305 Assignment 1

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Problem 1

```
1   for i = 1 to n
2       j = 1
3       while j<= i do
4           j = 2.5 * j
```

cost	time
C_1	$n+1$
C_2	n
C_3	$(n+1)\log_{2.5}$
C_4	$n\log_{2.5} n$

Detailed Runtime:

$$C_1 \cdot (n+1) + C_2 \cdot n + C_3 \cdot [(n+1)\log_{2.5}] + C_4 \cdot (n\log_{2.5} n)$$

Asymptotic Runtime:

$$\Theta(n \log n)$$

Problem 2

```
0   def factorial(n):
1       x = 1
2       while n > 1:
3           x = x * n
4           n = n - 1
5       return x
```

cost	time
C_1	1
C_2	n
C_3	$(n+1)\log_{2.5}$
C_4	$n\log_{2.5} n$