Review 1

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1. Fill in the blank entries when the numbers are sorted by insertion sort in non-decreasing order.

7	4	3	6	8	1	2
7	4	3	6	8	1	2
4	7	3	6	8	1	2
3	4	7	6	8	1	2
3	4	6	7	8	1	2
3	4	6	7	8	1	2
1	3	4	6	7	8	2
1	2	3	4	6	7	8

2. Fill in the blanks with proper number of iterations.

INSERTION-SORT(A)	cost	number of iterations
for j = 2 **to** n	c_1	n
key = $A[j]$	c_2	$n-1$
i = j - 1	c_4	$n-1$
while i > 0 **and** $A[i]$ > key	c_5	$\sum_{j=2}^{n} t_j$
$A[i + 1]$ = $A[i]$	c_6	$\sum_{i=2}^{n}(t_j-1)$
i = i - 1	c_7	$\sum_{j=2}^{n}(t_j-1)$
$A[i + 1]$ = key	c_8	$n-1$

t_j : The number of executions of the while loop test for j.

3. What is the running time of insertion sort when the input size is n?

(a) best case: $\theta(n)$, $t_j = $ ا

(b) worst case: $\theta(n^2)$, $t_j = $ ج