Lilibeth Blandon

Exam2: Part 3

A) a: 6 5 4 3 2 1 0 decreasing integers
- Find the midpoint of array $\frac{n}{2}$.
- Divide array a into a_{Left} a_{right}.
- If value of midpoint is greater than i then look in a_{Left} since all the numbers less than midpoint are in a_{left}, else look in a_{right}. Also if i = midpoint then return -1.
- Recursively look in either a_{left} or a_{right} and if it equals midpoint return -1.

$$T(n) = T(\frac{n}{2}) + 1$$

$$f(n) = 1 \qquad n^{\log_2 1} = n^1 = 1$$

$$f(n) = \theta(n^{\log_2 1})$$

$$T(n) = \theta(\log n) \leftarrow \therefore \text{By Case 2 of MT}$$

Explanation for Algorithm: This algorithm checks each midpoint and divides the problem into smaller problems to check each a_{left} or a_{right}. Since we are cutting the array in half and only doing work on just 1 subarray, then we are only checking log(n) of the array. Since we are only checking, midpoint, that takes constant time.

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B)

i\j	λ	a	b	c	a	a	c	a
λ	0	1	2	3	4	5	6	7
b	1	1	1	2	3	4	5	6
c	2	2	2	1	2	3	4	5
a	3	2	3	2	1	2	3	4
b	4	3	2	3	2	2	3	4
c	5	4	3	2	3	3	2	3
a	6	5	4	3	2	3	3	2
b	7	6	5	4	3	3	4	3↑

Total number of edits = 3

one example of a transformation -b which will make u = bcabca<u>b</u> into bcabca_