CS 331: Algorithms and Complexity (Spring 2024)
Unique Number: 50930, 50935 50940, 50945

Assignment 5

Due on Tuesday, 5 March, by 11.59pm

Problem 1

(8 pts)

(a) **(6 pts)**
A naive solution would be to split into 3 cases, one for each of the 3 possible operations
(1) Adding a gap to the first string
(2) Adding a gap to the second string
(3) Including characters in both strings
This yields a time complexity of $O(3^{m+n})$
Example: (IAN, CHEN)

(b) **(2 pts)**

1.

_	A	L	G	O
T	1	2	3	4
E	2	2	3	4
S	3	3	3	4
T	4	4	4	4

2.

Problem 2

(12 pts)

(a) *Ideas:*
Either the new character added is a new substring or it can be added to the previous palindrome and keep it a palindrome or a character two substrings behind to create a larger palindrome.
Recursion: OPT(i) = min(OPT(i - 1) + 1,)

_	C	O	F	F	E	E
E	1	2	3	4	5	6
E	2	3	4	5	6	7
F	2	3	4	3	4	5
F	3	4	5	4	3	4
O	4	3	4	5	4	5
C	5	4	5	6	5	6

(b)

Problem 3

(10 pts)

(a)

(b)