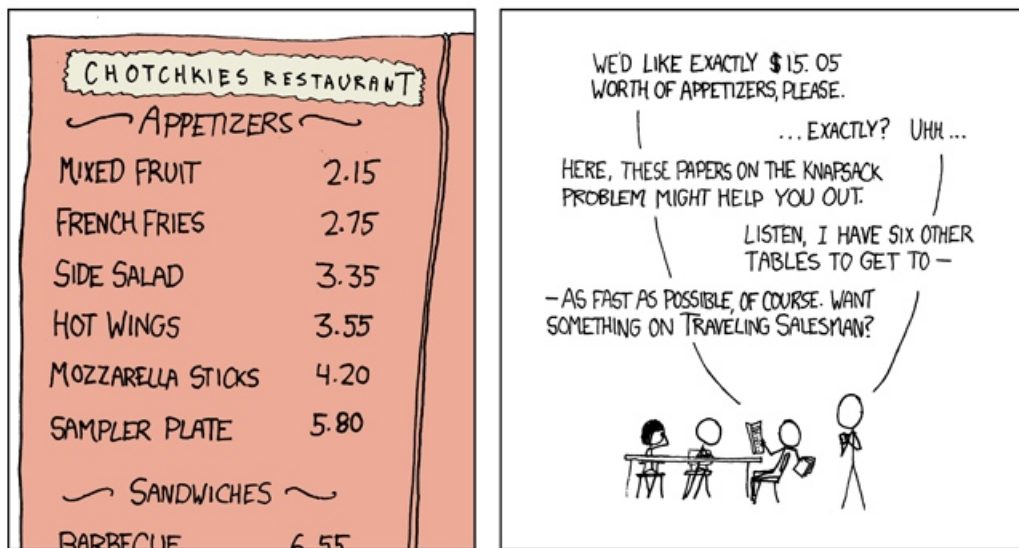


CS302 - Assignment 12

Due: Tuesday, April 9 at the beginning of class
Hand-in method: paper

MY HOBBY: EMBEDDING NP-COMPLETE PROBLEMS IN RESTAURANT ORDERS



<http://xkcd.com/287/>

1. [8 points] CLRS 16.2-3 (pg. 427). If you get stuck, write out a few examples and try and do them by hand.
2. [7 points] Given a set of points x_1, x_2, \dots, x_n on the real line, describe a greedy algorithm that determines the smallest set of unit-length closed intervals that contains all of the given points. State the worst case running time and prove that your algorithm is correct. You do not need write pseudo-code, but make your description clear.
3. [5 points] Suppose the symbols a, b, c, d, e occur with frequencies $1/2, 1/4, 1/8, 1/16, 1/16$ respectively,
 - (a) What is the Huffman encoding of the alphabet?
 - (b) If this encoding is applied to a file with 1 million characters with the given frequencies, what is the length of the encoded file in bits?
4. [13 points] CLRS problem 16-1, parts a-c (pg. 446)