Documentation for HW 10

The question could be translate to a easier version question, which is given d numbers (ranging from 1 - 256) and their occurences, then find a set of k numbers (also ranging from 1 - 256) minimizing the sum of $(d_i - k_i)^2$ * occurences of d_i (where k_i is the closest element to d_i in the set).

Let's say f[i][j] is the answer of the question, which d is replaced by i and k is replaced by j.

f[i][j] can be solved by transforming to f[k][j - 1] + cost[k + 1][i], which is $f[i][j] = \min(f[k][j-1] + cost[k][i])$, where $j-1 <= k < i$).

Technique used

To solve this question, dynamic programming is the technique we're going to use. Because
• The optimal solution (solution of f) contains optimal solutions to its subproblems(solution of cost).
• A particular subproblem or subsubproblem typically recurs while one tries different decompositions of the original problem.

Complexity

$O(n^3)$, because the nested loop to compute the table of solution of cost.

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