

Assignment 1:

Installation

1. To run the file, on a command prompt type 'python palindrome.py'

Explanation

1. In order to calculate the longest palindrome subsequence, we take the string and calculate its length, known as 'n'.
2. After calculation of length 'n', we then construct an nxn matrix that will house our values. The top right corner will give us the longest palindromic subsequence that we need. This will be the answer to our problem
3. For this problem, we will consider only the top half of the matrix. The bottom half of the matrix is discarded. At first, we initialize the matrix with 0's.
4. We then populate the diagonal of the matrix with the string. This is because for the first iteration of the algorithm we only consider one character at a time. Therefore, we populate for the first iteration.
5. For every iteration, we keep on considering the longest subsequence thereafter. For example, if our string was 'agbdba', in the second iteration, we will consider 'ag' then 'gb' then 'bd' so on and so forth and see if the characters match.
6. If there is a match, say in the case of 'bdb' we then take the matched characters and add the diagonally downward result in between the match.
7. Similarly, when the length is 5 (zero indexed), 'a' and 'a' match hence we take the diagonally downward element and add that in between our 'a', therefore we get, 'abdba', which happens to occupy the top right corner of the matrix. This makes it the largest palindromic value.
8. The running time of the algorithm is $O(n^2)$