Longest palindrome substring

Ip: Given a string S, find the longest palindrome substring in S

I/p: Banana
O/p: anana

This solved using DP approach.

Ex: ababa

if bab is already known as palindrome then ababa is a palindrome.

It is not required to find palindrome all the time. Store it and use it. (DP approach)

How to store and use it?

Ans: Base case:

// Every character is a palindrome

(1) $P[i, i] = True \quad S_i = S_i$

(2) $P[i, i+1] = True \text{ if } S_i = S_{i+j}$

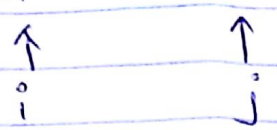
Ex: aa, bb, cc etc

Recursive case:

P[i ... j] = True if P[i+1, j-1] and $S_i = S_j$

otherwise false

Ex: a b a b a



$$P[i \cdots j] = \begin{cases} \text{True} & \text{if } P[i+1, j-1] \text{ and } S_i == S_j \\ \text{False} & \end{cases}$$

P[i+1, j-1] = bab which is palindrome already found

$S_i = S_j$; a = a so both are true

So

P[i .. j] = True

so a b a b a is palindrome.

Technical approach:

* First find the palindrome for length 1 and 2. Store it in the table.
* Now iterate from length = 3 to n with the above conditions.

What I've learned ?

* If a string problem is given create a table 2D array

* Find base condition and recursive condition of DP

* Usually base condition is of for length = 1 or 2 in a string.