

Q5) Heart of Algorithm

1) $dp[i][j][k]$ = max sum of common subsequence in one array from 1 to i elements & in 2nd array from 1 to j elements with partial sum $k = -1, 0, 1$

2) solⁿ \Rightarrow $dp[n][n][0]$

3) Recurrence from ^{Next} ~~124~~ Page

dp[i][j][0]:-

1) $dp[i-1][j-1][0] + A[i-1]$

where $A[i-1] == B[j-1]$

2) $\max(dp[i-1][j][0], dp[i][j-1][0],$
 $dp[i-1][j-1][2] +$

$((dp[i-1][j-1][2] != 0 ? 1 : 0) * A[i-1]))$

where $A[i-1] - B[j-1] == 1$

3) $\max(dp[i-1][j][0], dp[i][j-1][0], dp[i-1][j-1][0]$
 $+ ((dp[i-1][j-1][1] != 0 ? 1 : 0) * A[i-1]))$

where $A[i-1] - B[j-1] == -1$

4) $\max(dp[i-1][j][0], dp[i][j-1][0])$

where $A[i-1] - B[j-1] == 2$

or $A[j-1] - B[j-1] > |2|$

5) $\max(dp[i-1][j][0], dp[i][j-1][0])$

where $A[i-1] - B[j-1] == -2$

or $A[j-1] - B[j-1] > |2|$

dp[i][j][1]:

1) $dp[i-1][j-1][1] + ((dp[i-1][j-1][1] \neq 0 ? 1 : 0) * A[i-1])$

where $A[i-1] == B[j-1]$

2) $\max(dp[i-1][j][1], dp[i][j-1][1], dp[i-1][j-1][0] + A[i-1])$

where $A[i-1] - B[j-1] == 1$
~~or $A[i-1] - B[j-1] > 121$~~

3) $\max(dp[i-1][j][1], dp[i][j-1][1])$

where $A[i-1] - B[j-1] == -1$
~~or $A[i-1] - B[j-1] > 121$~~

4) $\max(dp[i-1][j][1], dp[i][j-1][1], dp[i-1][j-1][2] + ((dp[i-1][j-1][2] \neq 0 ? 1 : 0) * A[i-1]))$

where $A[i-1] - B[j-1] = 2$

5) $\max(dp[i-1][j][1], dp[i][j-1][1])$

where $A[i-1] - B[j-1] == -2$

~~or~~

$A[i-1] - B[j-1] > 121$

$dp[i][j][2]$:-

1) $dp[i-1][j-1][2] + ((dp[i-1][j-1][2] != 0 ? 1 : 0) * A[i-1])$

where $A[i-1] == B[j-1]$

2) $\max(dp[i-1][j][2], dp[i][j-1][2])$

where $A[i-1] - B[j-1] == 1$

or $A[i-1] - B[j-1] > 1$

3) $\max(dp[i-1][j][2], dp[i][j-1][2], dp[i-1][j-1][0] + A[i-1])$

where $A[i-1] - B[j-1] == -1$

4) $\max(dp[i-1][j][2], dp[i][j-1][2])$

where $A[i-1] - B[j-1] == 2$

or $A[i-1] - B[j-1] > 2$

5) $\max(dp[i-1][j][2], dp[i][j-1][2], dp[i-1][j-1][2] + ((dp[i-1][j-1][1] != 0 ? 1 : 0) * A[i-1]))$

where $A[i-1] - B[j-1] == -2$