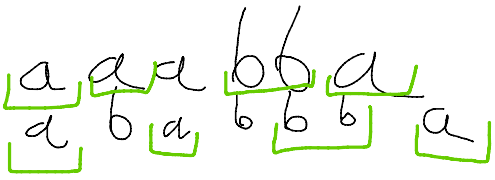
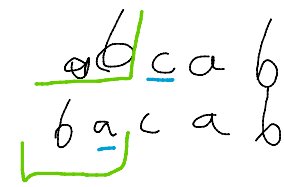
K10 - Dynamiki LCS

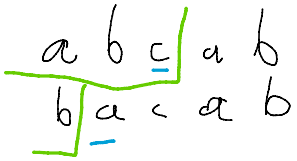
09 December 2022 17:38



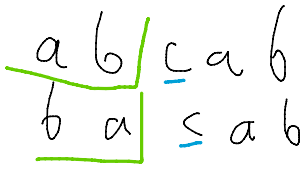
dp[i][j] - LCS - kończy się najpóźniej w i pierwszego słowa oraz j drugiego



$dp[i-1][j]$



$dp[i][j-1]$



$dp[i-1][j-1]+1$

```
for i = 1 ... n
    for j = 1 ... m
        dp[i][j] = max(dp[i-1][j], dp[i][j-1])
        if(t1[i] == t2[j])
            dp[i][j] = max(dp[i][j], dp[i-1][j-1]+1)

while(i > 0 && j > 0)
    if(t1[i] == t2[j])
        res += t1[i]
        i--
        j--
```

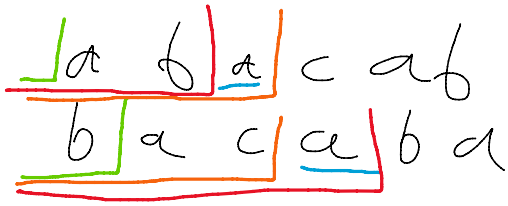
```
i--
j--
else if ( dp[i-1][j] > dp[i][j-1] )
    i--
else
    j--
```

$$dp[1][j] = \max(dp[0][j], dp[1][j])$$

$$dp[0] = dp[1]$$

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

$i \& 1$, $(i \& 1) \wedge 1$



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

```
if (lastA[i] != -1 && lastB[j] != -1 && A[i] == B[j])
    dp[i][j] = max(dp[i][j], dp[lastA[i]][lastB[j]] + 2)
```

$$dp[n][m] \le \min(n, m)$$

$dp[n][m] \leq \min(n, m)$

```
for   i = 1 ... n
    if (M.count(A[i]) == 0)
        last A[i] = -1
    else
        last A[i] = M[A[i]]
    M[A[i]] = i
```