

Assignment No : 2

Title : Spell checking and correction: Apply minimum edit distance between two strings for spelling correction.

Name : Temgire Vaishnav Kalidas

Roll No : 23107127

Class : TY-B

Batch : B

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s1 = input("Enter first string: ")
s2 = input("Enter second string: ")

m = len(s1)
n = len(s2)

T = [[0 for j in range(n + 1)] for i in range(m + 1)]

for i in range(m + 1):
    T[i][0] = i

for j in range(n + 1):
    T[0][j] = j

for i in range(1, m + 1):
    for j in range(1, n + 1):
        if s1[i - 1] == s2[j - 1]:
            T[i][j] = T[i - 1][j - 1]
        else:
            T[i][j] = min(
                T[i - 1][j] + 1,
                T[i][j - 1] + 1,
                T[i - 1][j - 1] + 1
            )

print("\nString 1:", s1)
print("String 2:", s2)
print("Minimum Edit Distance:", T[m][n])

print("\nT Matrix:")
for row in T:
    print(row)

# ----- BACKTRACKING -----
i = m
j = n
```

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insert_count = 0
delete_count = 0
replace_count = 0

while i > 0 or j > 0:
    if i > 0 and j > 0 and s1[i - 1] == s2[j - 1]:
        i -= 1
        j -= 1

    elif i > 0 and j > 0 and T[i][j] == T[i - 1][j - 1] + 1:
        replace_count += 1
        i -= 1
        j -= 1

    elif i > 0 and T[i][j] == T[i - 1][j] + 1:
        delete_count += 1
        i -= 1

    else:
        insert_count += 1
        j -= 1

print("\nOperation Count:")
print("Insertions :", insert_count)
print("Deletions   :", delete_count)
print("Replacements:", replace_count)

```

Enter first string: sunday
Enter second string: sonday

String 1: sunday
String 2: sonday
Minimum Edit Distance: 1

DP Matrix:

[0, 1, 2, 3, 4, 5, 6]
[1, 0, 1, 2, 3, 4, 5]
[2, 1, 1, 2, 3, 4, 5]
[3, 2, 2, 1, 2, 3, 4]
[4, 3, 3, 2, 1, 2, 3]
[5, 4, 4, 3, 2, 1, 2]
[6, 5, 5, 4, 3, 2, 1]

Operation Count:
Insertions : 0
Deletions : 0
Replacements: 1