

# Problem 72: Edit Distance

## Problem Information

**Difficulty:** Medium

**Acceptance Rate:** 0.00%

**Paid Only:** No

## Problem Description

Given two strings

word1

and

word2

, return

the minimum number of operations required to convert

word1

to

word2

.

You have the following three operations permitted on a word:

Insert a character

Delete a character

Replace a character

Example 1:

Input:

```
word1 = "horse", word2 = "ros"
```

Output:

3

Explanation:

horse -> rorse (replace 'h' with 'r') rorse -> rose (remove 'r') rose -> ros (remove 'e')

Example 2:

Input:

```
word1 = "intention", word2 = "execution"
```

Output:

5

Explanation:

intention -> inention (remove 't') inention -> enention (replace 'i' with 'e') enention -> exention (replace 'n' with 'x') exention -> exection (replace 'n' with 'c') exection -> execution (insert 'u')

Constraints:

$0 \leq \text{word1.length}, \text{word2.length} \leq 500$

word1

and

word2

consist of lowercase English letters.

## Code Snippets

### C++:

```
class Solution {  
public:  
    int minDistance(string word1, string word2) {  
  
    }  
};
```

### Java:

```
class Solution {  
public int minDistance(String word1, String word2) {  
  
}  
}
```

### Python3:

```
class Solution:  
    def minDistance(self, word1: str, word2: str) -> int:
```

### Python:

```
class Solution(object):  
    def minDistance(self, word1, word2):  
        """  
        :type word1: str  
        :type word2: str  
        :rtype: int  
        """
```

### JavaScript:

```
/**  
 * @param {string} word1  
 * @param {string} word2  
 * @return {number}  
 */  
var minDistance = function(word1, word2) {  
};
```

### TypeScript:

```
function minDistance(word1: string, word2: string): number {  
};
```

### C#:

```
public class Solution {  
    public int MinDistance(string word1, string word2) {  
        }  
    }
```

### C:

```
int minDistance(char* word1, char* word2) {  
}
```

### Go:

```
func minDistance(word1 string, word2 string) int {  
}
```

### Kotlin:

```
class Solution {  
    fun minDistance(word1: String, word2: String): Int {  
        }  
    }
```

**Swift:**

```
class Solution {  
    func minDistance(_ word1: String, _ word2: String) -> Int {  
  
    }  
}
```

**Rust:**

```
impl Solution {  
    pub fn min_distance(word1: String, word2: String) -> i32 {  
  
    }  
}
```

**Ruby:**

```
# @param {String} word1  
# @param {String} word2  
# @return {Integer}  
def min_distance(word1, word2)  
  
end
```

**PHP:**

```
class Solution {  
  
    /**  
     * @param String $word1  
     * @param String $word2  
     * @return Integer  
     */  
    function minDistance($word1, $word2) {  
  
    }  
}
```

**Dart:**

```
class Solution {  
    int minDistance(String word1, String word2) {
```

```
}
```

```
}
```

### Scala:

```
object Solution {  
    def minDistance(word1: String, word2: String): Int = {  
  
    }  
    }  
}
```

### Elixir:

```
defmodule Solution do  
  @spec min_distance(word1 :: String.t, word2 :: String.t) :: integer  
  def min_distance(word1, word2) do  
  
  end  
  end
```

### Erlang:

```
-spec min_distance(Word1 :: unicode:unicode_binary(), Word2 ::  
  unicode:unicode_binary()) -> integer().  
min_distance(Word1, Word2) ->  
.
```

### Racket:

```
(define/contract (min-distance word1 word2)  
  (-> string? string? exact-integer?)  
)
```

## Solutions

### C++ Solution:

```
/*  
 * Problem: Edit Distance
```

```

* Difficulty: Medium
* Tags: string, dp
*
* Approach: String manipulation with hash map or two pointers
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(n) or O(n * m) for DP table
*/

```

```

class Solution {
public:
    int minDistance(string word1, string word2) {

```

```

    }
};

```

### Java Solution:

```

/**
 * Problem: Edit Distance
* Difficulty: Medium
* Tags: string, dp
*
* Approach: String manipulation with hash map or two pointers
* Time Complexity: O(n) or O(n log n)
* Space Complexity: O(n) or O(n * m) for DP table
*/

```

```

class Solution {
public int minDistance(String word1, String word2) {

```

```

    }
};

```

### Python3 Solution:

```

"""
Problem: Edit Distance
Difficulty: Medium
Tags: string, dp

Approach: String manipulation with hash map or two pointers

```

```

Time Complexity: O(n) or O(n log n)
Space Complexity: O(n) or O(n * m) for DP table
"""

class Solution:
    def minDistance(self, word1: str, word2: str) -> int:
        # TODO: Implement optimized solution
        pass

```

### Python Solution:

```

class Solution(object):
    def minDistance(self, word1, word2):
        """
        :type word1: str
        :type word2: str
        :rtype: int
"""

```

### JavaScript Solution:

```

/**
 * Problem: Edit Distance
 * Difficulty: Medium
 * Tags: string, dp
 *
 * Approach: String manipulation with hash map or two pointers
 * Time Complexity: O(n) or O(n log n)
 * Space Complexity: O(n) or O(n * m) for DP table
 */

/**
 * @param {string} word1
 * @param {string} word2
 * @return {number}
 */
var minDistance = function(word1, word2) {

};

```

### TypeScript Solution:

```

/**
 * Problem: Edit Distance
 * Difficulty: Medium
 * Tags: string, dp
 *
 * Approach: String manipulation with hash map or two pointers
 * Time Complexity: O(n) or O(n log n)
 * Space Complexity: O(n) or O(n * m) for DP table
 */

function minDistance(word1: string, word2: string): number {
}

```

### C# Solution:

```

/*
 * Problem: Edit Distance
 * Difficulty: Medium
 * Tags: string, dp
 *
 * Approach: String manipulation with hash map or two pointers
 * Time Complexity: O(n) or O(n log n)
 * Space Complexity: O(n) or O(n * m) for DP table
 */

public class Solution {
    public int MinDistance(string word1, string word2) {
        }
    }

```

### C Solution:

```

/*
 * Problem: Edit Distance
 * Difficulty: Medium
 * Tags: string, dp
 *
 * Approach: String manipulation with hash map or two pointers
 * Time Complexity: O(n) or O(n log n)
 * Space Complexity: O(n) or O(n * m) for DP table

```

```
*/  
  
int minDistance(char* word1, char* word2) {  
  
}
```

### Go Solution:

```
// Problem: Edit Distance  
// Difficulty: Medium  
// Tags: string, dp  
//  
// Approach: String manipulation with hash map or two pointers  
// Time Complexity: O(n) or O(n log n)  
// Space Complexity: O(n) or O(n * m) for DP table  
  
func minDistance(word1 string, word2 string) int {  
  
}
```

### Kotlin Solution:

```
class Solution {  
    fun minDistance(word1: String, word2: String): Int {  
  
    }  
}
```

### Swift Solution:

```
class Solution {  
    func minDistance(_ word1: String, _ word2: String) -> Int {  
  
    }  
}
```

### Rust Solution:

```
// Problem: Edit Distance  
// Difficulty: Medium  
// Tags: string, dp
```

```

// 
// Approach: String manipulation with hash map or two pointers
// Time Complexity: O(n) or O(n log n)
// Space Complexity: O(n) or O(n * m) for DP table

impl Solution {
pub fn min_distance(word1: String, word2: String) -> i32 {

}
}

```

### Ruby Solution:

```

# @param {String} word1
# @param {String} word2
# @return {Integer}
def min_distance(word1, word2)

end

```

### PHP Solution:

```

class Solution {

/**
 * @param String $word1
 * @param String $word2
 * @return Integer
 */
function minDistance($word1, $word2) {

}
}

```

### Dart Solution:

```

class Solution {
int minDistance(String word1, String word2) {

}
}

```

### **Scala Solution:**

```
object Solution {  
    def minDistance(word1: String, word2: String): Int = {  
  
    }  
}
```

### **Elixir Solution:**

```
defmodule Solution do  
  @spec min_distance(word1 :: String.t, word2 :: String.t) :: integer  
  def min_distance(word1, word2) do  
  
  end  
end
```

### **Erlang Solution:**

```
-spec min_distance(Word1 :: unicode:unicode_binary(), Word2 ::  
  unicode:unicode_binary()) -> integer().  
min_distance(Word1, Word2) ->  
.
```

### **Racket Solution:**

```
(define/contract (min-distance word1 word2)  
  (-> string? string? exact-integer?)  
)
```