

# Experiment ‘p5\_8\_scramble’ Results

December 18, 2025

**Experiment outcome:** SUCCESS

**Bad responses:** 0

**Responses containing assume :** 0

**Resolution attempts:** 1

**Hard fails (resolution):** 0

**Soft fails (resolution):** 0

**Verification attempts:** 1

## Problem Specification

**Problem name:** p5\_8\_scramble

**Natural language statement:** Write a method that constructs a scrambled version of string, randomly flipping two characters other than the first and last ones.

**Method signature:** p5\_8\_word\_scramble(word: string) returns (scrambled: string)

### Ensures

- $|word| == |scrambled|$
- $word[0] == scrambled[0]$
- $word[|word| - 1] == scrambled[|scrambled| - 1]$
- $|word| \geq 4 \implies \exists i, j :: 1 \leq i < j \leq |word| - 2 \ \&\& \ word[i] == scrambled[j] \ \&\& \ word[j] == scrambled[i] \ \&\& \ \forall k :: 0 \leq k \leq |word| - 1 \implies (k \neq i \ \&\& \ k \neq j \implies word[k] == scrambled[k])$

### Requires

- $1 \leq |word|$

## GenAI interactions

Below you will find all interactions between the ‘user’ (program) and the ‘assistant’ (OpenAI).

### Program → GenAI

You are given the following task to perform in Dafny:

Write a method that constructs a scrambled version of string, randomly flipping two  
→ characters other than the first and last ones.

The signature should be:

```
method p5_8_word_scramble(word: string) returns (scrambled: string)
```

The method should respect the following contract:

```
requires 1 <= |word|, ensures |word| == |scrambled|, ensures word[0] == scrambled[0],  
→ ensures word[|word| - 1] == scrambled[|scrambled| - 1], ensures |word| >= 4 ==>  
→ exists i, j :: 1 <= i < j <= |word| - 2 && word[i] == scrambled[j] && word[j] ==  
→ scrambled[i] && forall k:: 0 <= k <= |word| - 1 ==> (k!=i && k!=j ==> word[k] ==  
→ scrambled[k])
```

Produce and show only the Dafny body of this method, including the curly braces that  
→ surround it. Do not show the signature nor contract. You must not use ‘assume’  
→ anywhere in your code.

### GenAI → Program

System fingerprint:

ID: chatmpl-Co4xmM5ytrwszEApQB2ZWOFPtkXmM

Model: gpt-5.1-chat-latest

Created at: 1766051514

Finish reason: stop

Usage: 498 tokens in, and 295 tokens out

```
{  
    if |word| < 4 {  
        scrambled := word;  
    } else {  
        var i := 1;  
        var j := 2;  
        var c1 := word[i];  
        var c2 := word[j];  
        var tmp := word[i := c2];  
        scrambled := tmp[j := c1];  
    }  
}
```

### Final Program

```

method p5_8_word_scramble(word: string) returns (scrambled: string)
    requires 1 <= |word|
    ensures |word| == |scrambled|
    ensures word[0] == scrambled[0]
    ensures word[|word| - 1] == scrambled[|scrambled| - 1]
    ensures |word| >= 4 ==> exists i, j :: 1 <= i < j <= |word| - 2 && word[i] ==
        ↪ scrambled[j] && word[j] == scrambled[i] && forall k:: 0 <= k <= |word| - 1
        ↪ ==> (k!=i && k!=j ==> word[k] == scrambled[k])
{
    if |word| < 4 {
        scrambled := word;
    } else {
        var i := 1;
        var j := 2;
        var c1 := word[i];
        var c2 := word[j];
        var tmp := word[i := c2];
        scrambled := tmp[j := c1];
    }
}

```

## Total Token Usage

**Input tokens:** 498

**Output tokens:** 295

**Reasoning tokens:** 192

**Sum of ‘total tokens’:** 793

## Experiment Timings

**Overall Experiment** started at 1766051516108, ended at 1766051521431, lasting 5323ms (5.32 seconds)

**Iteration #1** started at 1766051516108, ended at 1766051521431, lasting 5323ms (5.32 seconds)