

Experiment ‘p6_2_e_remove_middle’ 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: p6_2_e_remove_middle

Natural language statement: Write a method to remove the middle element of an array if the array length is odd, or the middle two elements if the length is even.

Method signature: p6_2_e_remove_middle(arr: seq<int>) returns (result: seq<int>)

Ensures

- $|result| == \text{if } |arr| \% 2 == 1 \text{ then } |arr| - 1 \text{ else } |arr| - 2$
- $|arr| \% 2 == 1 \implies \forall i :: 0 \leq i < |arr| / 2 \implies result[i] == arr[i] \ \&\& \forall j :: |arr| / 2 \leq j < |result| \implies result[j] == arr[j + 1]$
- $|arr| \% 2 == 0 \implies \forall i :: 0 \leq i < |arr| / 2 - 1 \implies result[i] == arr[i] \ \&\& \forall j :: |arr| / 2 - 1 \leq j < |result| \implies result[j] == arr[j + 2]$

Requires

- $|arr| \geq 1$

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 to remove the middle element of an array if the array length is odd, or
→ the middle two elements if the length is even.

The signature should be:

```
method p6_2_e_remove_middle(arr: seq<int>) returns (result: seq<int>)
```

The method should respect the following contract:

```
requires |arr| >= 1, ensures |result| == if |arr| % 2 == 1 then |arr| - 1 else |arr| - 2,  
→ ensures |arr| % 2 == 1 ==> forall i :: 0 <= i < |arr| / 2 ==> result[i] == arr[i]  
→ && forall j :: |arr| / 2 <= j < |result| ==> result[j] == arr[j + 1], ensures |  
→ arr| % 2 == 0 ==> forall i :: 0 <= i < |arr| / 2 - 1 ==> result[i] == arr[i] &&  
→ forall j :: |arr| / 2 - 1 <= j < |result| ==> result[j] == arr[j + 2]
```

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-Co56nbIK7sXqc83VFYUsdTRAIDdTG

Model: gpt-5.1-chat-latest

Created at: 1766052073

Finish reason: stop

Usage: 596 tokens in, and 180 tokens out

```
{  
    if |arr| % 2 == 1 {  
        var mid := |arr| / 2;  
        result := arr[..mid] + arr[mid+1..];  
    } else {  
        var mid1 := |arr| / 2 - 1;  
        var mid2 := |arr| / 2;  
        result := arr[..mid1] + arr[mid2+1..];  
    }  
}
```

Final Program

```
method p6_2_e_remove_middle(arr: seq<int>) returns (result: seq<int>)
```

```

requires |arr| >= 1
ensures |result| == if |arr| % 2 == 1 then |arr| - 1 else |arr| - 2
ensures |arr| % 2 == 1 ==> forall i :: 0 <= i < |arr| / 2 ==> result[i] == arr[i]
    ↪ && forall j :: |arr| / 2 <= j < |result| ==> result[j] == arr[j + 1]
ensures |arr| % 2 == 0 ==> forall i :: 0 <= i < |arr| / 2 - 1 ==> result[i] == arr
    ↪ [i] && forall j :: |arr| / 2 - 1 <= j < |result| ==> result[j] == arr[j +
    ↪ 2]
{
if |arr| % 2 == 1 {
    var mid := |arr| / 2;
    result := arr[..mid] + arr[mid+1..];
} else {
    var mid1 := |arr| / 2 - 1;
    var mid2 := |arr| / 2;
    result := arr[..mid1] + arr[mid2+1..];
}
}

```

Total Token Usage

Input tokens: 596

Output tokens: 180

Reasoning tokens: 64

Sum of ‘total tokens’: 776

Experiment Timings

Overall Experiment started at 1766052075296, ended at 1766052079355, lasting 4059ms (4.06 seconds)

Iteration #1 started at 1766052075296, ended at 1766052079355, lasting 4059ms (4.06 seconds)