

Experiment ‘p6_2_a_swap_first_last’ 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_a_swap_first_last

Natural language statement: Write a method to swap the first and last elements in an array.

Method signature: p6_2_a_swap_first_last(arr: seq<int>) returns (result: seq<int>)

Ensures

- $|result| == |arr|$
- $result[0] == arr[|arr| - 1]$
- $result[|arr| - 1] == arr[0]$
- $\text{forall } i :: 1 \leq i < |arr| - 1 \implies result[i] == arr[i]$

Requires

- $|arr| \geq 2$

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 swap the first and last elements in an array.

The signature should be:

```
method p6_2_a_swap_first_last(arr: seq<int>) returns (result: seq<int>)
```

The method should respect the following contract:

```
requires |arr| >= 2, ensures |result| == |arr|, ensures result[0] == arr[|arr| - 1],  
    ↪ ensures result[|arr| - 1] == arr[0], ensures forall i :: 1 <= i < |arr| - 1 ==>  
    ↪ result[i] == arr[i]
```

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-Co55qq2bYjRooPfEUvzUNiEB6tEAF

Model: gpt-5.1-chat-latest

Created at: 1766052014

Finish reason: stop

Usage: 380 tokens in, and 181 tokens out

```
{  
    result := [arr[|arr| - 1]] + arr[1..|arr| - 1] + [arr[0]];  
}
```

Final Program

```
method p6_2_a_swap_first_last(arr: seq<int>) returns (result: seq<int>)  
    requires |arr| >= 2  
    ensures |result| == |arr|  
    ensures result[0] == arr[|arr| - 1]  
    ensures result[|arr| - 1] == arr[0]  
    ensures forall i :: 1 <= i < |arr| - 1 ==> result[i] == arr[i]  
{  
    result := [arr[|arr| - 1]] + arr[1..|arr| - 1] + [arr[0]];  
}
```

Total Token Usage

Input tokens: 380

Output tokens: 181

Reasoning tokens: 128

Sum of ‘total tokens’: 561

Experiment Timings

Overall Experiment started at 1766052016129, ended at 1766052019928, lasting 3799ms (3.80 seconds)

Iteration #1 started at 1766052016129, ended at 1766052019928, lasting 3799ms (3.80 seconds)