

Experiment 'p6_2_c_replace_even_with_zero' Results

December 18, 2025

Experiment outcome: SUCCESS

Bad responses: 0

Responses containing assume : 0

Resolution attempts: 6

Hard fails (resolution): 5

Soft fails (resolution): 0

Verification attempts: 1

Problem Specification

Problem name: p6_2_c_replace_even_with_zero

Natural language statement: Write a method to replace all even elements in an array with 0.

Method signature: p6_2_c_replace_even_with_zero(arr: seq<int>) returns (result: seq<int>)

Ensures

- `|result| == |arr|`
- `forall i :: 0 <= i < |arr| ==> (arr[i] % 2 == 0 ==> result[i] == 0) && (arr[i] % 2 != 0 ==> result[i] == arr[i])`

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 replace all even elements in an array with 0.

The signature should be:

method p6_2_c_replace_even_with_zero(arr: seq<int>) returns (result: seq<int>)

The method should respect the following contract:

ensures |result| == |arr|, ensures forall i :: 0 <= i < |arr| ==> (arr[i] % 2 == 0 ==>
↪ result[i] == 0) && (arr[i] % 2 != 0 ==> 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: chatcmpl-Co55zJLAt3RwPBy2SGP5TTiBpv5P9

Model: gpt-5.1-chat-latest

Created at: 1766052023

Finish reason: stop

Usage: 364 tokens in, and 54 tokens out

```
{  
  result := seq i | 0 <= i < |arr| :: if arr[i] % 2 == 0 then 0 else arr[i];  
}
```

Program → GenAI

When using dafny resolve, the below error is emitted and resolve fails:

```
problem_data/p6_2_c_replace_even_with_zero/program.dfy(5,16): Error: openparen expected  
|  
5 | result := seq i | 0 <= i < |arr| :: if arr[i] % 2 == 0 then 0 else arr[i];  
| ^
```

```
problem_data/p6_2_c_replace_even_with_zero/program.dfy(5,35): Error: comma expected  
|  
5 | result := seq i | 0 <= i < |arr| :: if arr[i] % 2 == 0 then 0 else arr[i];  
| ^
```

2 parse errors detected in program.dfy

Correct the error by altering only the method body. Produce and show only the Dafny body,
→ 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: chatcmpl-Co561EoSZCoPXrApAkfirzkagD0z5

Model: gpt-5.1-chat-latest

Created at: 1766052025

Finish reason: stop

Usage: 661 tokens in, and 121 tokens out

```
{  
  result := seq (i | 0 <= i < |arr|) :: (if arr[i] % 2 == 0 then 0 else arr[i]);  
}
```

Program → GenAI

When using dafny resolve, the below error is emitted and resolve fails:

problem_data/p6_2_c_replace_even_with_zero/program.dfy(5,35): Error: comma expected

```
|  
5 | result := seq (i | 0 <= i < |arr|) :: (if arr[i] % 2 == 0 then 0 else arr[i]);  
| ^
```

1 parse errors detected in program.dfy

Correct the error by altering only the method body. Produce and show only the Dafny body,
→ 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: chatcmpl-Co564YHwjUXcrHf5BTHyJDfrFDEyI

Model: gpt-5.1-chat-latest

Created at: 1766052028

Finish reason: stop

Usage: 796 tokens in, and 185 tokens out

```
{  
  result := seq i | 0 <= i && i < |arr| :: (if arr[i] % 2 == 0 then 0 else arr[i]);  
}
```

Program → GenAI

When using dafny resolve, the below error is emitted and resolve fails:

```

problem_data/p6_2_c_replace_even_with_zero/program.dfy(5,16): Error: openparen expected
|
5 | result := seq i | 0 <= i && i < |arr| :: (if arr[i] % 2 == 0 then 0 else arr[i]);
| ^

problem_data/p6_2_c_replace_even_with_zero/program.dfy(5,40): Error: comma expected
|
5 | result := seq i | 0 <= i && i < |arr| :: (if arr[i] % 2 == 0 then 0 else arr[i]);
| ^

2 parse errors detected in program.dfy

Correct the error by altering only the method body. Produce and show only the Dafny body,
  ↪ 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: chatcmpl-Co567k0nsENerhtAHL5U20CndczP

Model: gpt-5.1-chat-latest

Created at: 1766052031

Finish reason: stop

Usage: 1132 tokens in, and 183 tokens out

```

{
  result := seq(i | 0 <= i < |arr|) (if arr[i] % 2 == 0 then 0 else arr[i]);
}

```

Program → GenAI

When using dafny resolve, the below error is emitted and resolve fails:

```

problem_data/p6_2_c_replace_even_with_zero/program.dfy(5,34): Error: comma expected
|
5 | result := seq(i | 0 <= i < |arr|) (if arr[i] % 2 == 0 then 0 else arr[i]);
| ^

1 parse errors detected in program.dfy

Correct the error by altering only the method body. Produce and show only the Dafny body,
  ↪ 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: chatcmpl-Co56BdKZ3gmLYfokVXBG8qVosAv5u

Model: gpt-5.1-chat-latest

Created at: 1766052035

Finish reason: stop

Usage: 1255 tokens in, and 120 tokens out

```
{
  result := seq(i | 0 <= i < |arr|) :: (if arr[i] % 2 == 0 then 0 else arr[i]);
}
```

Program → GenAI

When using dafny resolve, the below error is emitted and resolve fails:

problem_data/p6_2_c_replace_even_with_zero/program.dfy(5,34): Error: comma expected

```
5 | result := seq(i | 0 <= i < |arr|) :: (if arr[i] % 2 == 0 then 0 else arr[i]);
  | ^
```

1 parse errors detected in program.dfy

Correct the error by altering only the method body. Produce and show only the Dafny body,

→ 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: chatcmpl-Co56DbGIEpWyBYIcon87vzzIC7Xr3

Model: gpt-5.1-chat-latest

Created at: 1766052037

Finish reason: stop

Usage: 1452 tokens in, and 483 tokens out

```
{
  var res: seq<int> := [];
  var i := 0;
  while i < |arr|
    invariant 0 <= i <= |arr|
    invariant |res| == i
    invariant forall j :: 0 <= j < i ==> (arr[j] % 2 == 0 ==> res[j] == 0) && (arr[j] % 2
      → != 0 ==> res[j] == arr[j])
  {
    res := res + [if arr[i] % 2 == 0 then 0 else arr[i]];
    i := i + 1;
  }
  result := res;
}
```

Final Program

```
method p6_2_c_replace_even_with_zero(arr: seq<int>) returns (result: seq<int>)
  ensures |result| == |arr|
```

```

    ensures forall i :: 0 <= i < |arr| ==> (arr[i] % 2 == 0 ==> result[i] == 0) && (
        ↪ arr[i] % 2 != 0 ==> result[i] == arr[i])
{
  var res: seq<int> := [];
  var i := 0;
  while i < |arr|
    invariant 0 <= i <= |arr|
    invariant |res| == i
    invariant forall j :: 0 <= j < i ==> (arr[j] % 2 == 0 ==> res[j] == 0) && (arr[j] % 2
        ↪ != 0 ==> res[j] == arr[j])
    {
      res := res + [if arr[i] % 2 == 0 then 0 else arr[i]];
      i := i + 1;
    }
  result := res;
}

```

Total Token Usage

Input tokens: 5660

Output tokens: 1146

Reasoning tokens: 704

Sum of 'total tokens': 6806

Experiment Timings

Overall Experiment started at 1766052025066, ended at 1766052047365, lasting 22299ms (22.30 seconds)

Iteration #4 started at 1766052033644, ended at 1766052037245, lasting 3601ms (3.60 seconds)

Iteration #5 started at 1766052037245, ended at 1766052039431, lasting 2186ms (2.19 seconds)

Iteration #6 started at 1766052039431, ended at 1766052047365, lasting 7934ms (7.93 seconds)

Iteration #1 started at 1766052025067, ended at 1766052027605, lasting 2538ms (2.54 seconds)

Iteration #2 started at 1766052027605, ended at 1766052030469, lasting 2864ms (2.86 seconds)

Iteration #3 started at 1766052030469, ended at 1766052033644, lasting 3175ms (3.18 seconds)