

Experiment '2_10_hybrid_car_cost' 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: 2_10_hybrid_car_cost

Natural language statement: Write a method that helps a person decide whether to buy a hybrid car. Your method's inputs should be: the cost of a new car, the estimated miles driven per year, the estimated gas price, the efficiency in miles per gallon, the estimated resale value after 5 years. Compute the total cost of owning the car for five years.

Method signature: hybrid_car_cost(new_car_cost: real, miles_per_year: real, gas_price: real, mpg: real, resale_value: real) returns (total_cost: real)

Ensures

- `total_cost == new_car_cost + (miles_per_year / mpg) * gas_price * 5.0 - resale_value`

Requires

- `0.0 < mpg`

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 helps a person decide whether to buy a hybrid car. Your methods's

- ↪ inputs should be: the cost of a new car, the estimated miles driven per year, the
- ↪ estimated gas price, the efficiency in miles per gallon, the estimated resale
- ↪ value after 5 years. Compute the total cost of owning the car for five years.

The signature should be:

```
method hybrid_car_cost(new_car_cost: real, miles_per_year: real, gas_price: real, mpg:
  ↪ real, resale_value: real) returns (total_cost: real)
```

The method should respect the following contract:

```
requires 0.0 < mpg, ensures total_cost == new_car_cost + (miles_per_year / mpg) *
  ↪ gas_price * 5.0 - resale_value
```

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-Co4Q8JUilOJmPGuWuoFWtM0tpxOQ7

Model: gpt-5.1-chat-latest

Created at: 1766049428

Finish reason: stop

Usage: 452 tokens in, and 113 tokens out

```
{
  total_cost := new_car_cost + (miles_per_year / mpg) * gas_price * 5.0 - resale_value;
}
```

Final Program

```
method hybrid_car_cost(new_car_cost: real, miles_per_year: real, gas_price: real, mpg:
  ↪ real, resale_value: real) returns (total_cost: real)
  requires 0.0 < mpg
  ensures total_cost == new_car_cost + (miles_per_year / mpg) * gas_price * 5.0 -
    ↪ resale_value
{
  total_cost := new_car_cost + (miles_per_year / mpg) * gas_price * 5.0 - resale_value;
}
```

Total Token Usage

Input tokens: 452

Output tokens: 113

Reasoning tokens: 64

Sum of 'total tokens': 565

Experiment Timings

Overall Experiment started at 1766049430066, ended at 1766049433441, lasting 3375ms (3.38 seconds)

Iteration #1 started at 1766049430067, ended at 1766049433441, lasting 3374ms (3.37 seconds)