

Homework 1: MPG to L/100km Conversion Using Static Cast in C++

Objective:

Write a C++ program that accurately converts fuel efficiency measurements from miles per gallon (mpg) to liters per 100 kilometers (l/100km), incorporating explicit type conversion using `static_cast`.

Background:

Fuel efficiency in the U.S. is commonly measured in miles per gallon (mpg), while many European countries measure fuel efficiency in liters per 100 kilometers (l/100km). The conversion formula is given by:

$$\text{l/100km} = \frac{235.215}{\text{mpg}}$$

Instructions:

1. Include Necessary Headers:

- Use `<iostream>` for input and output operations.

2. Implement Main Function:

- Prompt the user to enter a fuel efficiency value in mpg.
- Use `std::cin` to capture this input and store it in a variable.

3. Perform Type-Safe Conversion:

- Use `static_cast` to ensure that the mpg value is treated as a double during division, thus preserving precision.

4. Output the Result:

- Display the conversion result.