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/*
Author: Aryan Bhatt
Course: CSCI-135
Instructor: Maryash
Assignment: Homework 4.6
*/

#include <iostream>
#include <string>
using namespace std;

int main()
{
  bool done = false;
  string unit1 = "";
  string unit2 = "";
  double factor1 = 0; // conversion factor from first unit to cm
  double factor2 = 0; // conversion factor from cm to second unit

  while (!done)
  {
    bool again = false; // true to repeat the same conversion
    cout << "From unit (in, cm, m, again, quit): " << endl;
    string command;
    cin >> command;
    if (command == "in")
    {
      factor1 = 2.54;
      unit1 = command;
    }
    else if (command == "cm")
    {
      factor1 = 1.0;
      unit1 = command;
    }
    else if (command == "m")
    {
      factor1 = 100.0;
      unit1 = command;
    }
    else if (command == "again")
    {
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    again = true;
  }
  else if (command == "quit")
  {
    done = true;
  }
  else
  {
    cout << "Sorry, unknown unit." << endl;
  }

  if (factor1 != 0 && !again && !done)
  {
    cout << "To unit: " << endl;
    cin >> unit2;
    if (unit2 == "in")
    {
      factor2 = 1.0 / 2.54;
    }
    else if (unit2 == "m")
    {
      factor2 = .01;
    }
    else if (unit2 == "cm")
    {
      factor2 = 1;
    }
    else
    {
      cout << "Sorry, unknown unit." << endl;
    }
  }

  if (factor2 != 0 && !done)
  {
    // Read value to be converted
    double value;
    cin >> value;
    // Convert and print result
    cout << value << " " << unit1 << " = "
      << value * factor1 * factor2 << " " << unit2 << endl;
  }
}
```

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    return 0;
}
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