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Programming Assignment 1 Report

<u>Step 5:</u>

- An input of milesTraveled=100 and gasConsumed=0 resulted in an output of 1.$ mpg. This is because the input caused the program to divide by zero (100/0), which is undefined. The undefined behavior caused the program to produce a nonsensical result.

-An input of milesTraveled=125 and gasConsumed=4 resulted in an output of 31.3mpg. This is an incorrect result because 125/4=31.25mpg. The result is not entirely accurate because the program only rounds to one digit after the decimal point because of the formula "cout.setf(ios::fixed); cout.precision(1);" Therefore, this program will produce a slightly inaccurate result when the output contains more than one digit after the decimal point.

-An input of milesTraveled=-200 and gasConsumed=4 resulted in an output of -50.0mpg. This result is nonsensical because it is impossible to travel -200 miles. However, -200 is a valid input of the variable milesTraveled (it is a double) so the program is executed even though the result makes no sense.

<u>Step 6:</u>

 In the program logic_error.cpp, I introduced the logic error of declaring the variable mpg as "double mpg = milesTraveled + gasConsumed;" instead of "double mpg = milesTraveled / gasConsumed;" Although this error does not prevent a successful build, mpg is not calculated correctly from reasonable input. This is because milesTraveled is added to gasConsumed instead of divided by it. As a result, there is a valid translation and no error messages, but the program does not produce the desired result.

Example:

-An input of milesTraveled=100 and gasConsumed=5 resulted in an output of 100+5=105.0mpg. The correct result is 100/5=20.0mpg.

<u>Step 7:</u>

 In the program compile_error.cpp, I introduced two compile errors that prevented the program from being translated into machine language.

The first compile error of writing "using namespace std" instead of "using namespace std;" produces the error message:

1>c:\users\sdulaney\documents\visual studio 2010\projects\compile_error\compile_error\compile_error.cpp(7): error C2144: syntax error : 'int' should be preceded by ';'

This invalid use of C++ prevents the program from compiling because there must be a ";" at the end of the line denoting the namespace. Without a namespace, C++ does not understand the names used in the program because they are not built into C++. As a result, the program does not compile.

The second compiler error of writing and "cin >> gasconsumed;" instead of "cin >> gasConsumed;" produces the error message:

1>c:\users\sdulaney\documents\visual studio 2010\projects\compile_error\compile_error\compile_error.cpp(15): error C2065: 'gasconsumed' : undeclared identifier

Because C++ is case sensitive, it does not read "gasconsumed" as the variable "gasConsumed" previously declared in the program. As a result, "gasconsumed" is considered an undeclared identifier and the program does not compile.