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/*****************************************************************************
*       Author: Jessica Schuler
*       Date Created: 11-30-13
*       Filename:  A6.cpp
*       Overview:
*        This program asks a user to input the numerator and denominator
*        of a fraction.  It then outputs the decimal form of the fraction
*        and the lowest form of the fraction.
*       Input:
*          The user inputs the desired numerator and denominator.
*       Output:
*          The output should show the fraction of the numbers entered as a
*          decimal number and it should show the fraction in its lowest
*          possible form.
*****************************************************************************/

#include<iostream>
#include<limits>//used for error checking

using namespace std;

class fraction//creates the class fraction
{
      private:
         int numer;//declares the numerator
         int denom;//declares the denominator
         int find_common_div(int num1, int num2);//Finds common divisor
      public:
         fraction(){numer=1; denom=1;}//sets default numbers
         void set_numer();//sets the numerator
         void set_denom();//sets the denominator
         double get_double();//gets the fraction as a decimal point
         void output_lowest();//outputs the lowest possible fraction form
};

int main ()
{
      fraction f1;//declare f1

      cout<<"Welcome to the Fraction Calculator!"<<endl;
      f1.set_numer();//calls function to set numerator
      f1.set_denom();//calls function to set denominator

      cout<<"The decimal form of your fraction is: ";
      f1.get_double();//calls function to get the fraction as a decimal
      cout<<endl;//added for readability
      cout<<"The fraction in its lowest form is: ";
      f1.output_lowest();//calls function to output lowest form of the fraction

      return 0;
}
//This function gets user input & sets the numerator number with input error checking
void fraction::set_numer()
{
      bool valid= false;
      do//loop to keep running until a proper integer has been entered
      {
            cout<<"Enter an integer for the numerator of a fraction: ";
            cin>>numer;//gets user input number
            if(cin.good())
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            {
                        valid=true; //sets bool to true if input is good
            }
            else
            {
                  cin.clear();//clears bad input
                  cin.ignore(numeric_limits<streamsize>::max(),'\n');
                  cout<<"Invalid input, Please re-enter."<<endl;
            }
      }while(!valid);
}
//This function gets user input & sets the denominator number with input error
checking
void fraction::set_denom()
{
      bool valid= false;
      do//loop to keep running until a proper integer has been entered
      {
            cout<<"Enter an integer for the denominator of a fraction: ";
            cin>>denom;//gets user input number
            if(cin.good())
            {
                  valid=true;//sets bool to true if input is good
            }
            else
            {
                  cin.clear();//clears bad input
                  cin.ignore(numeric_limits<streamsize>::max(),'\n');
                  cout<<"Invalid input, Please re-enter."<<endl;
            }
      }while(!valid);
}
//This function takes the user input numerator and denominator and
//outputs the fraction as a decimal out to 2 places past the decimal point
double fraction::get_double()
{
      cout.setf(ios::fixed);
      cout.setf(ios::showpoint);
      cout.precision(2);//sets decimal point out 2 past the decimal point
      cout<<(double)(numer)/(double)(denom);//set these to double to ensure double
output
}
//This Function takes the user input numerator and denominator to calculate the
lowest
//fraction form. It calls functiion find_common_div to get the greatest common
divisor and
//then uses that to output the lowest fraction form.
void fraction::output_lowest()
{
      int great;
      great = find_common_div(numer, denom);
      cout<<(numer/great)<<"/"<<(denom/great)<<endl;
}
//This function takes in the user input numerator and denominator to find the
greatest
//common divisor by looping through the variables until the greatest is found. It
will return
//a 1 if this is the greatest.
int fraction::find_common_div(int num1, int num2)
{
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      for(int i = num2; i>0; i--)
      {
            if(((num2 % i)==0)&&((num1 % i)==0))
            {
               return i;
            }
      }
      return 1;
}
```