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CSTools Listing and Executions

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```

*****
*****
**                                     **
**                               hwl.cc listing                               **
**                                     **
*****
*****
#include <iostream>
using namespace std;

/*
  Steven Liu
  CS215-J001
  Spring, 2011
  Homework 1

  Program description:
  This program will ask for and take 2 integers from the user and tells user
  whether the two given integers are "relatively prime" numbers
*/

//secondary function prototype
int GetIntBetween(int min, int max);
int GetInt();
int CountCommonFactors(int first, int second);
int WhichSmaller(int first, int second);
void DisplayOutput(int first, int second, int commonfactors);

int main(){
    //variable declaration and definition
    int first;                //input - first user integer input
    int second;               //input - second user integer input
    int commonfactors;        //calculated - # common factors

    //get first integer
    cout << "Enter a first whole number between 1 and 1000: ";
    first = GetIntBetween(1, 1000);

    //get second integer
    cout << "Enter a second whole number between 1 and 1000: ";
    second = GetIntBetween(1, 1000);

    //count # of common factors between first and second
    commonfactors = CountCommonFactors(first, second);

    //display output to user
    DisplayOutput(first, second, commonfactors);
}

//gets an integers from the user between "min" and "max"
int GetIntBetween(int min, int max){
    //variable dec+def
    int num;                //input - user integer input between 1 and 1000

    //range checking - integer must be between min and max
    num = GetInt();
    while (num < min || num > max){
        cout << "Bad input; Number must be between " << min

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        << " and " << max << "; Try again: ";
        num = GetInt();
    }

    return num;
}

//gets an integer from the user
int GetInt(){
    //variable dec+def
    int num;                //input - user integer input

    //type checking - user must enter an integer
    cin >> num;
    while (!cin.good()){
        cout << "Bad input; Integer input required; Try again: ";
        cin.clear();
        cin.ignore(80, '\n');
        cin >> num;
    }

    return num;
}

//count # of common factors that are greater than 1 between the two given ints
int CountCommonFactors(int first, int second){
    //variable dec+def
    int commonfactors;      //calculated - counts # of common factors
    int smaller;            //calculated - the smaller of the two inputs

    smaller = WhichSmaller(first, second);

    //find # common factors > 1 between the two integers
    commonfactors = 0;
    for (int i = 2; i <= smaller; i++){
        if (first % i == 0 && second % i == 0)
            commonfactors++;
    }

    return commonfactors;
}

//finds and returns the smaller of the two passed args
int WhichSmaller(int first, int second){
    //variable dec+def
    int smaller;            //calculated - the smaller of the two inputs

    //finds the smaller of the two values
    if (first < second)
        smaller = first;
    else
        smaller = second;

    return smaller;
}

//display output to the user
void DisplayOutput(int first, int second, int commonfactors){

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```
cout << endl << first << " and " << second << " share "
      << commonfactors << " common factors greater than 1" << endl;

cout << first << " and " << second;
if (commonfactors == 0)
    cout << " ARE";
else
    cout << " are NOT";
cout << " relatively prime" << endl;
}
```

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*****
*****
**                                     **
**                               hwl.cc compilation                **
**                                     **
*****
*****
c++ compilation succeeded
```

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**		**
**	hwl.cc execution - unstructured testcase input from sample [#1]	**
**		**

Enter a first whole number between 1 and 1000: 54		
Enter a second whole number between 1 and 1000: 36		
54 and 36 share 5 common factors greater than 1		
54 and 36 are NOT relatively prime		

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**		**
**	hwl.cc execution - unstructured testcase input from sample 2 [#2]	**
**		**

Enter a first whole number between 1 and 1000: 64		
Enter a second whole number between 1 and 1000: 77		
64 and 77 share 0 common factors greater than 1		
64 and 77 ARE relatively prime		

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***** ***** ** ** hwl.cc execution - unstructured testcase normal range, low-high [#3] ** ** ***** *****		
Enter a first whole number between 1 and 1000: 23 Enter a second whole number between 1 and 1000: 908 23 and 908 share 0 common factors greater than 1 23 and 908 ARE relatively prime		

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***** ***** ** ** hwl.cc execution - unstructured testcase normal range, high-low [#4] ** ** ***** *****		
Enter a first whole number between 1 and 1000: 87 Enter a second whole number between 1 and 1000: 23 87 and 23 share 0 common factors greater than 1 87 and 23 ARE relatively prime		

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***** ***** ** ** hwl.cc execution - unstructured testcase normal range, equal [#5] ** ***** ***** Enter a first whole number between 1 and 1000: 124 Enter a second whole number between 1 and 1000: 124 124 and 124 share 5 common factors greater than 1 124 and 124 are NOT relatively prime		

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***** ***** ** ** hwl.cc execution - unstructured testcase boundary testcase 1 [#6] ** ***** ***** Enter a first whole number between 1 and 1000: 1 Enter a second whole number between 1 and 1000: 1000 1 and 1000 share 0 common factors greater than 1 1 and 1000 ARE relatively prime		

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***** ***** ** ** hwl.cc execution - unstructured testcase boundary testcase 2 [#7] ** ***** ***** Enter a first whole number between 1 and 1000: 1 Enter a second whole number between 1 and 1000: 1 1 and 1 share 0 common factors greater than 1 1 and 1 ARE relatively prime		

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***** ***** ** ** hwl.cc execution - unstructured testcase boundary testcase 3 [#8] ** ***** ***** Enter a first whole number between 1 and 1000: 1000 Enter a second whole number between 1 and 1000: 1 1000 and 1 share 0 common factors greater than 1 1000 and 1 ARE relatively prime		

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*****
**                               **
**      hwl.cc execution - unstructured testcase out of range 1 [#9]      **
**                               **
*****
*****
Enter a first whole number between 1 and 1000: 0
Bad input; Number must be between 1 and 1000; Try again: -1
Bad input; Number must be between 1 and 1000; Try again: 9083
Bad input; Number must be between 1 and 1000; Try again: 1001
Bad input; Number must be between 1 and 1000; Try again: 987461523
Bad input; Number must be between 1 and 1000; Try again: 1
Enter a second whole number between 1 and 1000: 0
Bad input; Number must be between 1 and 1000; Try again: 1001
Bad input; Number must be between 1 and 1000; Try again: -893432
Bad input; Number must be between 1 and 1000; Try again: 1234567890
Bad input; Number must be between 1 and 1000; Try again: 9

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1 and 9 share 0 common factors greater than 1
1 and 9 ARE relatively prime

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*****
*****
**                               **
**      hwl.cc execution - unstructured testcase wrong input data type [#10]      **
**                               **
*****
*****
Enter a first whole number between 1 and 1000: pizza
Bad input; Integer input required; Try again: p i z z a
Bad input; Integer input required; Try again: pi
Bad input; Integer input required; Try again: one
Bad input; Integer input required; Try again: hundred
Bad input; Integer input required; Try again:
abc
Bad input; Integer input required; Try again: 0
Bad input; Number must be between 1 and 1000; Try again: ack
Bad input; Integer input required; Try again: 1
Enter a second whole number between 1 and 1000: soda
Bad input; Integer input required; Try again: -0
Bad input; Number must be between 1 and 1000; Try again: .one
Bad input; Integer input required; Try again: $fice
Bad input; Integer input required; Try again: $5
Bad input; Integer input required; Try again: 9877
Bad input; Number must be between 1 and 1000; Try again: 8

```

```

1 and 8 share 0 common factors greater than 1
1 and 8 ARE relatively prime

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**		**
**	hwl.cc execution - unstructured testcase strange cases [#11]	**
**		**

Enter a first whole number between 1 and 1000: 012345		
Bad input; Number must be between 1 and 1000; Try again: 012		
Enter a second whole number between 1 and 1000: 0000001		
12 and 1 share 0 common factors greater than 1		
12 and 1 ARE relatively prime		

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**		**
**	hwl.cc execution - unstructured testcase mixed type/range [#12]	**
**		**

Enter a first whole number between 1 and 1000: 12.9		
Enter a second whole number between 1 and 1000: Bad input; Integer input required; Try again: 9		
12 and 9 share 1 common factors greater than 1		
12 and 9 are NOT relatively prime		

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*****
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**                               **
**      hwl.cc execution - unstructured testcase strange cases [#13]      **
**                               **
*****
*****
Enter a first whole number between 1 and 1000: 0.123
Bad input; Number must be between 1 and 1000; Try again: Bad input; Integer input required; Try again: 1001.1001
Bad input; Number must be between 1 and 1000; Try again: Bad input; Integer input required; Try again: 1001.1
Bad input; Number must be between 1 and 1000; Try again: Bad input; Integer input required; Try again: 1
Enter a second whole number between 1 and 1000: 000000000.1
Bad input; Number must be between 1 and 1000; Try again: Bad input; Integer input required; Try again: 00000000000234

1 and 234 share 0 common factors greater than 1
1 and 234 ARE relatively prime

```