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ENGR 1200U

Introduction to Programming
Assignment #2

Question #1 - Vowels

```cpp
/*
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Assignment #2 - Question 1
February 22nd, 2015

Program prompts user for string input,
counts and outputs number of vowels,
places an underscore after each vowel,
then outputs the new string.
User can exit program by entering "end".
*/

// import packages
#include <iostream>
#include <string>
#include <cctype>

// import standard c++ library
using namespace std;

int main()
{
        // declare variables
        string input,
                lowerInput = "",
                newString = "";
        int vowels = 0;

        // prompt user for input
        cout << "Please enter a string.\n";

        // getline used to account for whitespace
        // but discard terminating character (newline/enter)
        getline(cin, input);

        for (int k = 0; k < input.length(); k++)
        {
                // convert inputted string to lower case
                // for easier comparison
                lowerInput += tolower(input.at(k));

                // terminate if word is "end"
                if (lowerInput == "end")
                        return 0;
        }

        // find vowels within string
        for (int i = 0; i < input.length(); i++)
        {
                if (lowerInput.at(i) == 'a'
                        || lowerInput.at(i) == 'e'
```

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                || lowerInput.at(i) == 'i'
                || lowerInput.at(i) == 'o'
                || lowerInput.at(i) == 'u'
                || lowerInput.at(i) == 'y')
        {
                // append underscore after vowel
                newString += input.at(i);
                newString += '_';

                // count vowels
                ++vowels;
        }
        else
        {
                newString += input.at(i);
        }
    }

    // output amount of vowels and resulting string
    cout << "Vowels: " << vowels << endl
            << "Modified string: " << newString << endl;

    // exit program
    return 0;
}
```

Question #2 – Five Integers

```cpp
/*
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Assignment #2 - Question 2
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Program prompts user for 5 integers,
determines how many are even or odd,
calculates the mean and median of them,
and outputs the results of each.
*/

// import package
#include <iostream>

// import standard c++ library
using namespace std;

int main()
{
	// declare and initialize variables
	int value = 0,
		sum = 0,
		evenNums = 0,
		oddNums = 0,
		int1 = 0,
		int2 = 0,
		int3 = 0,
		int4 = 0,
		int5 = 0,
		temp = 0;
	double mean = 0,
		median = 0;

	// prompt user for values and calculate sum
	cout << "Please enter 5 integers.\n";
	for (int j = 0; j < 5; j++)
	{
		cin >> value;

		switch (j)
		{
		case 0:
			int1 = value;
			break;
		case 1:
			int2 = value;
			break;
		case 2:
			int3 = value;
			break;
		case 3:
			int4 = value;
			break;
		case 4:
			int5 = value;
			break;
```

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        }

        // determine even or odd values
        if (value % 2 == 0)
        {
                ++evenNums;
        }
        else
        {
                ++oddNums;
        }
        sum += value;
    }

    // calculate mean of integers
    mean = sum / 5.0;

    // sort to find median of all five integers
    while (int1 > int2 || int2 > int3 || int3 > int4 || int4 >
int5)
    {
        if (int1 > int2)
        {
                temp = int1;
                int1 = int2;
                int2 = temp;
        }
        else if (int2 > int3)
        {
                temp = int2;
                int2 = int3;
                int3 = temp;
        }
        else if (int3 > int4)
        {
                temp = int3;
                int3 = int4;
                int4 = temp;
        }
        else if (int4 > int5)
        {
                temp = int4;
                int4 = int5;
                int5 = temp;
        }
    }

    median = int3;

    // output results
    cout << "Even integers = " << evenNums
            << "\nOdd integers = " << oddNums
            << "\nMean = " << mean
            << "\nMedian = " << median << endl;

    // exit program
    return 0;}
```