Devante Wilson
ENGR 1200U

February 7th, 2015

Introduction to Programming
Assignment #1

Question 1 – Area of a triangle

```
/*
Devante Wilson
January 17th, 2015
Assignment 1 - Question 1

Program calculates and displays the area
of a triangle based on user input
*/

// import iostream library needed for input/output
#include <iostream>

// use standard c++ package
using namespace std;

int main()
{
	// Declare variables
	double area, base, height;

	// Prompt and get user input
	cout << "Enter a value for a triangle's base in inches.\n";
	cin >> base;

	cout << "Enter a value for a triangle's height in inches.\n";
	cin >> height;

	// Calculate area based on user input
	area = 0.5*(base*height);

	// Display area of triangle
	cout << "The area of this triangle is " << area << " square inches." << endl;

	// Exit program
	return 0;
}
```

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Question 2 – Sum of integers

```
/*
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Assignment 1 - Question 2

Program calculates the sum of the integers between two numbers.
User is prompted to enter the first number and the number of integers
to be added.
*/

// import libraries
#include <iostream>

// use standard c++ package
using namespace std;

int main()
{
	// Declare variables
	int num1, intNum, intDiff, sum;

	cout << "Please enter an integer" << endl;
	cin >> num1;

	cout << "How many numbers would you would like to sum from previous integer?" << endl;
	cin >> intNum;

	// Initialize variables
	intDiff = 1;
	sum = (intNum / 2)*(2 * num1 + (intNum - 1)*intDiff);

	// Output the sum of the integers
	cout << "The sum of " << intNum << " integers from " << num1 << " is " << sum << endl;

	// Exit program
	return 0;
}
```

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Question 3 – Maximum load

```
/*
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Assignment 1 - Question 3

Program computes the maximum load in pounds
that can be placed at the end of a symmetrical rectangular beam
*/

// Import libraries
#include <iostream>
#include <cmath>

// Import standard c++ package
using namespace std;

int main()
{
	// Declare variables
	double maxLoad, stress, inertia, loadDistance, halfBeamHeight, base, height;

	// Initialize variables
	base = 2;
	height = 4;
	halfBeamHeight = height / 2.0;
	inertia = base * pow(height, 3) / 12.0;
	stress = 3000;
	loadDistance = 12 * 8;
	maxLoad = (stress * inertia) / (loadDistance * halfBeamHeight);

	// Output for part a)
	cout << "The max load that can be placed on beam a) is " << maxLoad << endl;

	// Initialize variables for part b)
	base = 3;
	height = 6;
	halfBeamHeight = height / 2.0;
	inertia = base * pow(height, 3) / 12.0;
	maxLoad = (stress * inertia) / (loadDistance * halfBeamHeight);

	// Output for part b)
	cout << "The max load that can be placed on beam b) is " << maxLoad << endl;

	// Exit program
	return 0;
}
```