

# CS&E 1222

## Lab 2 – Arithmetic

## Lab Assignment – 20 points

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- ✓ The *lab* must be accomplished solely by you:
  - DO NOT look at anyone's code other than your own, including code from another's student in your section or another section of the course, or any third party source, e.g. the Internet
  - DO NOT share or copy anyone else's code for any graded assignment
  - DO NOT work in pairs or groups

### Setting up the Programming Environment

1. At the Linux command line type `mkdir lab2`. This will create a new directory named **lab2**. Work out of this directory. In order to do that, type `cd lab2`. This changes the current working directory to the directory **lab2**.
2. If you have created the directory **lab2**, then just type `cd lab2`.
3. Copy the file **fallVenus.exe** in the directory `/class/cse1222/9643/lab2` by typing

```
cp /class/cse1222/9643/lab2/fallVenus.exe .
```

Be sure to include **9643** (this is your course section indicator) and the period, “.”.

4. Copy the file **projectileDist.exe** in the directory `/class/cse1222/9643/lab2` by typing

```
cp /class/cse1222/9643/lab2/projectileDist.exe .
```

Be sure to include **9643** (this is your course section indicator) and the period, “.”.

### Programming Assignment

1. Create a new file **fallVenus.cpp** which will contain a program to compute the falling distance and velocity on the venus. The program should read in the time in seconds. The formula for the velocity after  $t$  seconds is:

$$velocity = g * t$$

where  $g = 8.83$  meters per second<sup>2</sup> and  $t$  is the time in seconds. The formula for the distance after  $t$  seconds is:

$$distance = (1/2) * velocity * t$$

Write your program using the following initial code:

```
// File: fallVenus.cpp
// Created by: Your Name
// Created on: Creation Date

/* Place your comment here */

#include <iostream>
using namespace std;

int main()
{
    /* Place your solution here */

    return(0);
}
```

Replace “Your name” with your name, “Creation Date” with today’s date, “Place your comment here” with a comment that briefly specifies what problem your program solves, and “Place your solution here” with your C++ code. Use single line comments where appropriate. Your program must produce exactly the same output as illustrated in **fallVenus.exe** on the same inputs values.

Compile and run your program and check it against **fallVenus.exe**.

2. Create a new file **projectileDist.cpp** which will contain a program to compute the horizontal distance travelled by a projectile shot at a 45 degree angle with an initial velocity  $v$  on earth.

The program should read in the initial velocity  $v$  (in meters per second.) The formula for the horizontal distance travelled is:

$$distance = v^2/g$$

where  $g = 9.81$  meters per second<sup>2</sup>. Compute  $v^2$  with the expression  $v * v$ .

Write your program using the program template given for Part 1 (**fallVenus.cpp**) of this assignment. Change “File” on the first line to say **projectileDist.cpp** instead. Make any other appropriate changes to your program including the “Creation Date”, “Place Your Comment Here”, and “Place Your Solution Here”. Use single line comments where appropriate. Your program must produce exactly the same output as illustrated in **projectileDist.exe** on the same inputs values.

Compile and run your program and check it against **projectileDist.exe**.

## Submit Your Work

**Important: Any program which does not compile and run will receive no credit!**

If you are not sure what this means please ask your instructor.

Submit your files **fallVenus.cpp** and **projectileDist.cpp** using the *Lab2* drop box on Carmen using the “Assignments” tab. **DO NOT** submit the file **a.out**. **DO NOT** submit uncompleted work from *Quiz2*. This will not be graded.