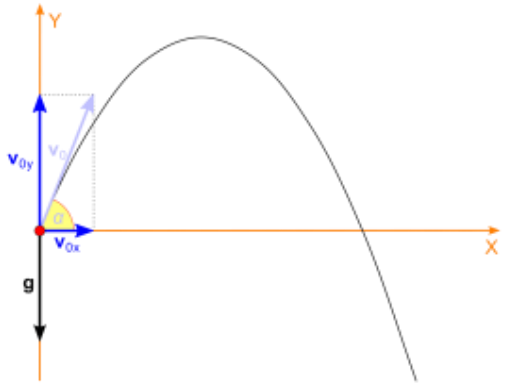
Assignment 1: Fundamentals

This assignment must be completed Individually. Discussing ideas and communication between students is encouraged but sharing any part of the code is prohibited and will be considered as plagiarism and a major breach of College's Academic Integrity policy which is defined in ACAD-101.

In this project you will create a simple Java console application that will have the user enter several values and will use these values to calculate the position of a projectile after a specific period.

Your program will calculate the maximum horizontal distance covered by a projectile by neglecting air resistance to simplify the calculations. The below diagram represents a projectile's motion under the influence of gravity.



The provided formula represents the maximum horizontal distance covered by a projectile:

$$R = \frac{v^2 \sin 2\theta}{g}$$

V: represent the value of the projectiles initial speed.

Θ: represent the initial angle in which the projectile was launched at.

g: represent the value of gravitational force.

Requirements:

Your program should prompt the user to enter the initial angle of the projectile in degrees. It will then prompt the user to enter the initial velocity of the projectile. Afterward, the program will use the provided user inputs and formulas to calculate the maximum horizontal distance of the projectile.

- g: gravitational force is a fixed value (unchangeable) of 9.8 m/s^2
- All user inputs can have decimal values
- Since the user might enter a negative value, your program needs to use the absolute values when needed.
- Assume the user will only enter numeric values (no validation is needed)
- Output value to three decimal point

Program Specifications

The full program will be in the main class. No functions are required at this point. Once the user enters the values, your program should calculate and print the coordinates of the projectile in a meaningful output. Your program only needs to run once and will terminate after it calculates the required values.

General Requirements

- Include an opening comment with your name, the name of the program, the date, and a short description.
- Follow the style guide! Use descriptive names and sensible datatypes for variables, constants, arrays, functions, etc. that follow our naming conventions. Use good spacing and make sure braces ({}) are located where they are supposed to be.
- Output messages must be meaningful. Displaying values is not enough, the user must understand what they are seeing.
- Your design should implement strong encapsulation rules
- Your design should implement modularity concepts

Demo

To demo the assignment, you must:

- Create a Short Video presentation. Your presentation should start with an introduction, where it must include a PowerPoint or Google slide that includes 1 single slide, that introduces who you are, to start your video.

- The first (and only) slide of your presentation must include current images of you (no avatars allowed) that are displayed appropriately on the page. You must also include your Full Name, Student ID, the Course Code, Course Name, and your Assignment information.

- You will demonstrate your program's functionality. You must show your program working properly on your live site. You will also use your assignment status report as a checklist during your Video Presentation

- You must will describe the code in your files that drives the functionality of your program – you will want to do this part well and be clear.

- Sound for your video must at an appropriate level so that your voices may be clearly heard, and your screen resolution should be set so that your program's code and console details are clearly visible

- Your Short Video should run no more than 2~5 minutes

- An assignment submission will not be accepted without a video recorded demo

Submission:

- You will be responsible for submitting all the files (coding files and video) on DC connect.
- A few things you must be aware of before submitting:
    - Make sure to submit your work on DC Connect before due date
    - Submit your .java files (not the full project, just the .java files you used to code your work)
    - Submit the video you created as a separate file, no zip files please.
    - Up to -25% deduction if you decide to submit a zip or compressed file
    - Grades will be granted according to class coding guidelines, professionalism, output clarity and solution ingenuity.
- A working link to your completed private project on GitHub

    - Please make sure you add me (Sergio.Santilli@durhamcollege.ca) as a contributor on your project so I can obtain access to review.

- Late Penalty will be applied (-25% per day for a maximum of 3 days) according to the course outline policy.

Good Luck!!