GSET - Programming with Mr. Hill - Summer 2021

Introduction to C++ - Challenge 6 - Rocket Stability

Overview:

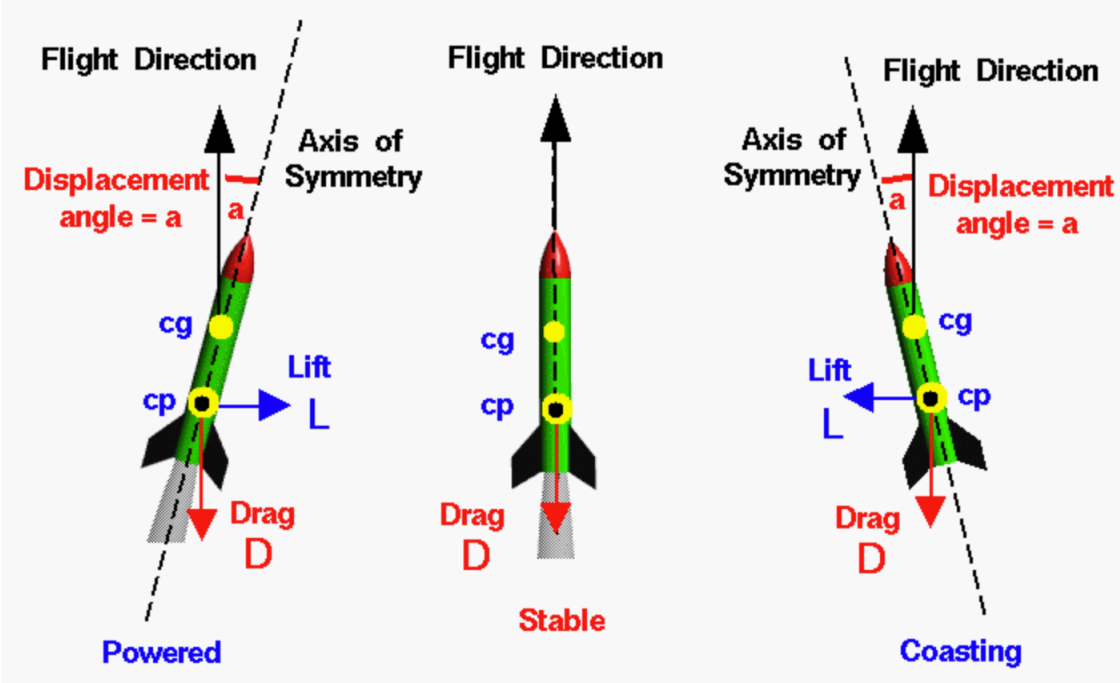
We are going to write a C++ program to perform the stability analysis required for the design of a model rocket. This is one way you can help the mission!

System Requirements:

- **Computer**: A computer is required to complete this tutorial. Any OS should work.
- **C++:** You can use the online C++ compiler (OnlineGDB) or a C++ compiler of your choice.

Problem Statement:

- Given: The physical properties of the rocket including the dimensions and mass of the individual components
- Find: The center of gravity and center or pressure of the proposed design. Also if the rocket is stable, unstable, or quasi-stable.



Program Minimum Requirements:

The program should accomplish the following tasks.

- The inputs (rocket parameters) should be stored in your program.
- Your program should calculate the center of gravity using the method provided.
- Your program should calculate the center of pressure using the method provided.
- Your program should determine whether the input design is stable using the criterion provided.

Optional Advanced Features:

- The possible range for each input should be stored as an array in your program.
- there are so many things you could do!

Part 3 - Testing:

1. Develop a C++ program to the solve the problem described.

2. Determine a reasonable range for each of the possible inputs. We will discuss this part as a class.

3. Use the program you have developed to choose an optimal rocket design. Record the values you chose and document the process you used to determine these values.

4. Save your code with the download button or use copy and paste. You can view and edit the code in any text editor. Also, save a copy of the program output for your tutorial summary.

Solution Code:

Challenge Summary:

Write a brief summary of what you accomplished and what you struggled with the most. Include the following items in the summary:

- a copy of the output of your program
- a description of what the program does and how to use it