**Project Summary**

**Collaborator Names:**

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**This program solves a problem:**

**A cannon shoots in 3 different atmospheres which means 3 different gravities. How does the cannon ball react to these different gravities?**

**A program that does 2 things.**

**- Graphs the trajectory of a cannon ball that is shot upward from the surfaces of 3 different objects in our solar system, Earth, Mars, and our Moon.**

**- Outputs the Max Height of the cannon ball, Distance the cannon ball traveled before hitting the ground, Amount of Time the cannon ball was off the ground before hitting the ground.**

**I got this idea from a class I am currently taking, “The Solar System”, and a lab I took in my physics class about ‘trajectory motion’.**

**INSTRUCTIONS / SUMMARY:**

**1) Follow the prompts produced in the console**

**2) Allow a few second for the code to run and produce an output**

**The output below shows the calculated data from the Earth, Moon, and Mars. Afterwards, it shows a graph that depicts the trajectory of all three using the same axis in all three graphs. The axis for the largest trajectory is used for all three so that all of them can be displayed. The graphs are in meters.**

**\*\*\*\*Update\*\*\*\***

**We included a portion in the code to give the user the ability to choose the color of the projectile flight trail, the angle and the velocity the projectile was shot.**

**We created a Repository on GitHub.com that houses our project and summary for this project where others can contribute, copy, or learn from this project. Or we can make updates and develop it further to enhance our Python skills even further.**

<https://github.com/rbaas293/pythonr-final-project>

**\*\*\*OUTPUT\*\*\***

**enter the velocity the projectile was shot (in meters/second): 25**

**enter the angle the projectile was shot at (in degrees): 20**

**chose a color for Earth 1 = blue, 2 = red, 3 = green, 4 cyan, 5 = white: 1**

**chose a color for our Moon 1 = blue, 2 = red, 3 = green, 4 cyan, 5 = white: 3**

**chose a color for Mars 1 = blue, 2 = red, 3 = green, 4 cyan, 5 = white: 5**

**\*\*Projectile Information\*\***

**On Earth**

**Maximum Height: 3.726 (m)**

**Final Distance of Impact: 40.947 (m)**

**Time of Flight: 1.743 (s)**

**\*\*Projectile Information\*\***

**On Our Moon**

**Maximum Height: 22.565 (m)**

**Final Distance of Impact: 247.985 (m)**

**Time of Flight: 10.556 (s)**

**\*\*Projectile Information\*\***

**On Mars**

**Maximum Height: 9.853 (m)**

**Final Distance of Impact: 108.276 (m)**

**Time of Flight: 4.609 (s)**

