

Lab 2 - Out of Lab Assignment

Due Saturday, February 6, 2021, 11 am

Acknowledge your collaborators or source of solutions, if any. Do all of the following.

- 1) Consider a satellite that is in a low orbit about the Earth at a given altitude in km above Earth's surface. Write a program that takes input from the user for the altitude of the satellite and calculates the orbital speed of this satellite. The orbital speed may have decimal values that should be rounded up using the ceiling. The output should be a meaningful sentence. You need to use functions for the calculation when using the equation. Use the information given below.

The formula is:
$$\text{velocity} = \sqrt{(\text{gravitational constant} * \text{total mass} / \text{orbit radius})}$$

$$v = \sqrt{(G * M / r)}$$

Important information:Gravitational constant $G = 6.673 * 10^{-11} \text{ Nm}^2/\text{Kg}^2$ Mass of earth $M = 5.98 * 10^{24} \text{ kg}$ Radius $r = \text{Radius of earth} + \text{altitude provided by the user}$ Radius of earth $= 6.37 * 10^6 \text{ m}$

Check the “Programming Guideline” document on Blackboard to know what to submit.

A sample of input and output:

Orbital speed Calculator

Input: Enter the altitude of the Satellite in km: 220**Output:** The orbital speed of the satellite is 7782 m/s.