Astronauts on board a spaceship have discovered a new exoplanet on their journey through the heliopause and want to input data about it into a catalog for transmission back to Earth. The astronauts decide to get help from HAL 0.1 to make this catalog.

The astronauts have recorded observations of the *radius* and *density of* the exoplanet in decimal number format, but the catalog can only accept the input as integer numbers, so HAL 0.1 needs to take in the decimal *radius* and *density* values entered by the astronauts into the console and convert them to integer format. The astronauts also want to add the *volume of* the exoplanet to the catalog, so HAL 0.1 must compute the *volume of* the exoplanet.
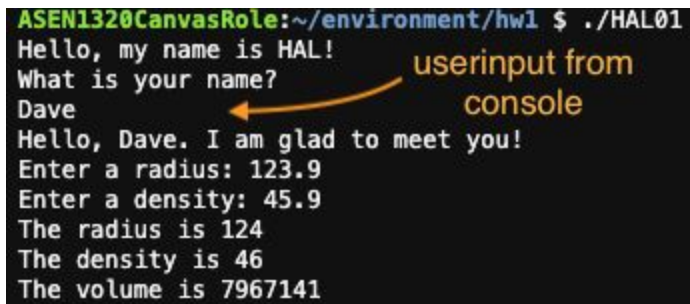
Write a C++ program that performs all the tasks specified above. All the computation should be done just in main () using iostream and string libraries, elementary arithmetic operations and type casting. Additionally, the program should at the beginning print the message "Hello, my name is HAL!", and on a new line, print the message "What is your name?". Then the program should take in *username* entered by the astronaut to the console and print the message "Hello, *username*. I am glad to meet you!" on a new line. The program should prompt users for input of the *radius* and *density* values from the console with the message "Enter a radius: " and "Enter a density: " on separate new lines. After data type conversion and calculation, the program should print the messages "The radius is *radius*", "The density is *density*", "The volume is *volume*" on separate new lines.

Conversion rules from decimal to integer numbers are as follows:
   • *density* and *radius* need to be rounded *up or down* to the nearest integer number. (Round *up* if over 0.5 and round *down* otherwise. This rounding operation can be achieved by adding 0.50 first and then using C++ type casting operation.)
   • *volume* needs to be rounded *down* to the nearest integer number. (Unlike the rounding example above, this does not take into consideration the decimal part of the value so a number like 5.999999 would be rounded *down* to 5. This flooring operation can be achieved by C++ type casting operation.)

Additional details are given below.

- Sample console output:

- The source file should be named **HAL01.cpp** and have *just enough* comments for the purpose of documentation.
- Write your original version of **HAL01.cpp,** compile and run test cases on AWS cloud 9 IDE and submit the code to GradeScope.
- Note that the range of integer type (4 bytes) when testing the code is −2,147,483,648 to 2,147,483,647. Integer variables cannot hold too large or too small numbers.
- Conversion of decimal values to integer values should be done after computation of **volume** to avoid rounding-off errors.
- Use double precision to represent decimal numbers in the code.
- Use 3.141592653589793 for pi.