Programming Lab – Weight on Different Planets
PHYS 2511 – Prof. Matthew Newby – Spring 2018

Goal:	Create a Python program that determines the weight of an explorer on a planet, given the planet's composition, size, and altitude of the explorer.
Requirements:	A python program that reads in a specially-formatted data file, takes in the mass and altitude of a human explorer, and returns the weight of the explorer.
Inputs:	• Data File • Planet of interest's name • Altitude above average radius • Explorer's Mass
Outputs:	• The explorer's weight • Gravitational acceleration (in "g"s)

Possible Issues: Unit conversions

Background:

The input files will be in the following format:

```
# Planet's Name, Average Radius of Planet, Density of planet
Earth;  6371.0 km;  5.514 g/cm^3;
Mars;  3389.5 km;  3.9335 g/cm^3;
(more lines)
```

You will need to read this file in, decode it, convert units (as necessary), then do your calculations.

Recall that the weight of an object is equal to its acceleration due to gravity.

Newton's 2nd Law: $F = ma$

Newton's Law of gravitation: $F_g = G\frac{Mm}{r^2}$

The mass of an object, given its density and volume, is: $M = \rho V$

The volume of a sphere: $V = \frac{4}{3}\pi r^3$