**Nature**

In the past there was a big incident involving a Mars orbiter and about 125 million dollars. The issue had to due with the fact that half the team was using English units of measurement while the other half used metric units of measurement. In order to prevent this, I programmed a unit conversion tool for these shortsighted NASA engineers so that they could get their rocket into space.

**Method**

First the program prompts the client for some measurements in fathoms and mechanical horsepower. The program then takes these numbers and performs some operations on them using known mathematical constants to convert it into the SI units NASA needs. With these new measurements in metric units, it outputs it back onto the terminal screen for the NASA engineers to use. Without this program the rocket cannot successfully orbit mars.

**Steps**

First, I had to find out how to get from English units to SI units. To do this, I used the chemistry concepts of stoichiometry and dimensional analysis. I lined up all of the units and made sure that they all canceled out. Once I found the right orientation of units that gave me SI units post cancelation, I made note of it and applied it into programming. Finally, I wrote the code to convert from English units to metric units using a combination of the \* and / operators.

**Issues and Problems**

While deriving the right combination of \* and / operators in the conversion calculation, I noticed that if one is accidentally switched with another, the answer comes out completely different. To address this mishap, I used dimensional analysis on paper first before writing it out on code.

**Concepts**

While writing this project I learned what a fathom is. Before this I had no idea this unit of length measurement existed. I also learned how to rearrange operators in different orders to achieve my intended purpose. The most interesting thing I learned was the NASA incident and how silly their engineers are. I hope they put this program to good use.

**References**

<https://en.wikipedia.org/wiki/Fathom>