AST 301
Homework #5
Due Friday Mar. 4

1. Pick one of the moons of Jupiter in Table A-14 in your book. Read off its distance from Jupiter and its orbital period. Use these numbers to calculate the mass of Jupiter, using Newton's generalization of Kepler's 3rd law: $P^2 = a^3 / M$.
Note that P and a in the table will have to be converted to the right units before putting them into this formula. What units is your calculated mass of Jupiter in when you use this formula? How does this formula change when it is used to calculate masses of stars?

2. Sketch an HR diagram.
Label the axes with a few numbers and the names of the quantities plotted.
Note the location of the Sun on your diagram, the main sequence, the red giants and the white dwarfs.
Draw arrows showing how the location of the Sun on your diagram would change if:
a) its luminosity stayed constant while its temperature increased by a factor of 2
b) its radius stayed constant while its temperature increased by a factor of 2
c) its temperature stayed constant while its radius increased by a factor of 2
The heads of your arrows should show where the Sun will be on the diagram after the luminosity, radius, or temperature changed.