Assignment #6
Use Your Designs and Write Python Programs
Due: Monday, 11/05/12, 11:59pm

In this assignment, you will turn your 3 designs into Python code. You will write 3 computer programs using your sequential, conditional, and looping design.

1. Write a Python program that takes the amount of coupons won as input and outputs how many candy bars and gumballs you can get. Remember, you can redeem 10 coupons for a candy bar or 3 coupons for a gumball, and you prefer candy bars to gumballs. Output how many candy bars and gumballs you get, when you spend all of your coupons on candy bars first and any remaining coupons on gumballs.

2. Write a Python program takes the weight (in pounds) and radius (in feet) of a sphere as input and outputs whether the sphere will sink or float in the water. Use $\gamma = 62.4$ lb/ft$^3$ as the specific weight of water, and the volume of the sphere is $(4/3)\pi r^3$. The buoyant force can be computed by

$$F_b = V \times \gamma$$

where $F_b$ is the buoyant force, $V$ is the volume of the submerged object, and $\gamma$ is the specific weight of the fluid. If $F_b$ is greater than or equal to the weight of the object, your program will output, “This sphere will float”, otherwise it will output, “This sphere will sink.”

3. Write a Python program that takes a positive number $n$ as input and outputs the square root of $n$ using the Babylonian algorithm. Remember, the Babylonian algorithm computes the square root of a positive number, $n$, as follows:

1. Make a guess at the answer (you can pick $n/2$ as your initial guess).
2. Compute $r = n / \text{guess}$
3. Set $\text{guess} = (\text{guess} + r) / 2$
4. Go back to step 2 for as many iterations as necessary. The more steps 2 and 3 are repeated, the closer $\text{guess}$ will become to the square root of $n$.

Our next speaker is Dr. M.M. Dalkilic, Indiana University Associate Professor, and he will talk about Bioinformatics. Since many of you have not heard of Bioinformatics, do some research about the Bioinformatics group at Indiana University, as well as get a general sense of what bioinformatics is. Add two questions for our next speaker to the end of your paper.

Electronically submit your 3 Python files as .py files and questions for our next speaker as a pdf by the assignment due date, using TEACH:
https://secure.engr.oregonstate.edu:8000/teach.php?type=want_auth