**Python Programming Assignment**

Q1. Write a password generator in Python. Be creative with how you generate passwords - strong passwords have a mix of lowercase letters, uppercase letters, numbers, and symbols. The passwords should be random, generating a new password every time the user asks for a new password. Include your code in a main method.

Extra:

* Ask the user how strong they want their password to be. For weak passwords, pick a word or two from a list.

Q2. Take a list, say for example this one:

a = [1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89]

and write a program that prints out all the elements of the list that are less than 5.

Extras:

1. Instead of printing the elements one by one, make a new list that has all the elements less than 5 from this list in it and print out this new list.
2. Write this in one line of Python.
3. Ask the user for a number and return a list that contains only elements from the original list a that are smaller than that number given by the user.

Q3. Create a program that will play the “cows and bulls” game with the user. The game works like this:

Randomly generate a 4-digit number. Ask the user to guess a 4-digit number. For every digit that the user guessed correctly *in the correct place*, they have a “cow”. For every digit the user guessed correctly *in the wrong place* is a “bull.” Every time the user makes a guess, tell them how many “cows” and “bulls” they have. Once the user guesses the correct number, the game is over. Keep track of the number of guesses the user makes throughout teh game and tell the user at the end.

Say the number generated by the computer is 1038. An example interaction could look like this:

Welcome to the Cows and Bulls Game!

Enter a number:

>>> 1234

2 cows, 0 bulls

>>> 1256

1 cow, 1 bull

...

Until the user guesses the number.

Q4. Write a program that asks the user how many Fibonnaci numbers to generate and then generates them. Take this opportunity to think about how you can use functions. Make sure to ask the user to enter the number of numbers in the sequence to generate.(Hint: The Fibonnaci seqence is a sequence of numbers where the next number in the sequence is the sum of the previous two numbers in the sequence. The sequence looks like this: 1, 1, 2, 3, 5, 8, 13, …)

Q5. Given two .txt files that have lists of numbers in them, find the numbers that are overlapping. [One .txt file](http://www.practicepython.org/assets/primenumbers.txt) has a list of all prime numbers under 1000, and [the other .txt file](http://www.practicepython.org/assets/happynumbers.txt) has a list of happy numbers up to 1000.

(If you forgot, prime numbers are numbers that can’t be divided by any other number. And yes, happy numbers are a real thing in mathematics - you can [look it up on Wikipedia](http://en.wikipedia.org/wiki/Happy_number). The explanation is easier with an example, which I will describe below.)