PHSX 331 Homework 1 - Practice with Python.

Due September 5th 5:00 p.m.

Goal of this assignment is to give you some practice doing simple tasks with Python. I would recommend doing these in order as each problem will get a little harder and you can use the previous problem to help solve the next one.

For problem 1 use the list foo, put this into a cell in a Jupyter Notebook and you will get the same random set of numbers.

```
In [1]: import numpy
        numpy.random.seed(0)
        foo = numpy.random.randint(0,100,25)
        print(foo)
```

```
[44 47 64 67 67  9 83 21 36 87 70 88 88 12 58 65 39 87 46 88 81 37 25 77
 72]
```

Problem 1: Summing a list / array

a) Use a *for* loop and an *if* statement to find the sum of all of the even numbers in the array "foo"

b) Find the sum of all of the odd numbers in the array "foo"

Problem 2: Fun with Fibonacci

a) The Fibonacci numbers are a set of numbers that are found by adding the last two numbers of the series together. The first two numbers are given as,

```
In [2]: fib_num = [0, 1]
```

The next number in the series would be,

```
In [3]: fib_num[0] + fib_num[1]
```

```
Out[3]: 1
```

Then we would want to ***append*** that output to the end of our list fib_num so it would look like,

```
In [4]: fib_num = [0,1,1]
```

Then we add the last two numbers of the series together, 1 + 1. So the fourth number in the series is 2. We can do this as many times as we want.

Find all the Fibonacci numbers less than 100. You can easily check that your code works by hand. *Hint:* In python there is a very easy way to call the last element of a list.

b) Find the sum of all even Fibonacci numbers less than 1,000. If your program in question **2a** is slow then this might take awhile. Try to spend some time optimizing your program in the last part first. If you can't optimize that's fine, you just might need to wait a bit for an answer. (You should just combine your code from question **1a** and **2a**)

Problem 3: Falling (with style)

a) Finds the time (t) it takes to hit the ground if dropped from some hight, assuming no air resistance, for the distances, 1 meter, 1,250 ft (Empire State Building), 254 miles (International Space Station). Be careful with your units.

Extra Credit: Finding Primes

For 1 point of extra credit, write a program that tells weather or not an input number is prime. The program should return a boolean, True or False, So it should look something like this,

```
In [5]: prime_finder(3)

Out[5]: True

In [6]: prime_finder(10)

Out[6]: False
```

Test it on the numbers 2, 231, 9851, and 9853