Solutions to Assignment 1 by Aether Zhou
This file is
https://docs.google.com/document/d/1KjoDD42_f9q_A4SLO3gGfmFbxwSROilb4_yV-FM3E3w/edit?usp=sharing
Python filename is assignment_one_aether_zhou.py

Python assignment 1 with outputs

1) Write a function named `tempertureConvert(degreesCelsius)` that takes a Celsius temperature from the user, converts it to Faranheit, and prints out the results.

```
In [93]: temperatureConvert(37)
Out[93]: 98.6
```

2) Run the function you wrote and convert 37 degrees Celsius to Farenheit.

```
In [93]: temperatureConvert(37)
Out[93]: 98.6
```

3) Write function `tempertureConvertPrintsThrice(degreesCelsius)` so it outputs the result in a human readable way, saying for example '37 degrees Celsius is 98.6 degrees Fahrenheit'. Formatting strings in python is a bit complicated and full of legacy - there are three(!) different ways to do this in python, as described here; do it one of each. We will mostly use the second method, but you should be able to do all three.

```
In [94]: temperatureConvertPrintsThrice0(37)
Out[94]: '37 degrees Celsius is 98.6 degrees Fahrenheit.'

In [95]: temperatureConvertPrintsThrice1(37)
Out[95]: '37 degrees Celsius is 98.6 degrees Fahrenheit.'

In [96]: temperatureConvertPrintsThrice2(37)
Out[96]: '37 degrees Celsius is 98.6 degrees Fahrenheit.'

In [97]: temperatureConvertPrintsThrice(37)
Out[97]: '37 degrees Celsius is 98.6 degrees Fahrenheit'
```

4) Write a function called `myPolynomial(x)` that lets you enter a number x, and returns $2x^2 - 3x + 2$

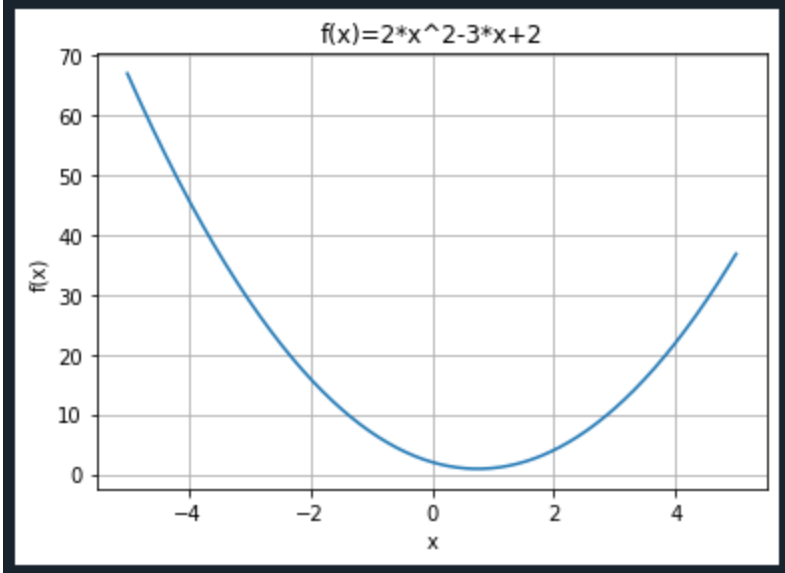
```
In [2]: myPolynomial(0)
Out[2]: 2

In [3]: myPolynomial(-3)
Out[3]: 29

In [4]: myPolynomial(4.57)
Out[4]: 30.059800000000003
```

5) Write functions `addOddsToNWithFor(n)`,`addOddsToNWithWhile(n)`, and `addOddsToNWithNumPy(n)` that returns the sum of all the odd integers between 1 and n. Do this three ways: 1) by using a for loop. 2) by using a while loop 3) by constructing the appropriate numPy array. Help on numPy is here; `np.arange()` is especially useful. If no argument is given, it should default to n=10000. Help on default arguments (which are an awesome feature of python) is here. You might find the modulo command useful.

```
In [98]: addOddsToNWithFor(98)
Out[98]: 2401

In [99]: addOddsToNWithWhile(98)
Out[99]: 2401

In [100]: addOddsToNWithNumPy(98)
Out[100]: 2401

In [101]: for x in range(0,10000):
     ...:     if (addOddsToNWithFor(x) != addOddsToNWithNumPy(x)) or
(addOddsToNWithWhile(x) != addOddsToNWithNumPy(x)):
     ...:         print('Error!')
     ...: print('Good!')
Good!

In [102]:
```

6) Write a function `plotMyPolyomial()` that calls `myPolynomial`, and plots it from a range -5 < x < 5. This will involve several new tools, including the very important numPy package and matPlotLib package; you will need to add a line to your file to import these packages. I recommend doing this in several intermediate steps. These examples are a good place to start. It is good practice to label your plots; make sure to include a title, x, and y axis labels. Look into using np.arange. You might find your plots are showing up in an annoying place, like a window behind all your other windows; once again, the internet is your friend - see, for example this help page from Stack Exchange. Stack exchange is an AMAZING resource for programming in Python; you should basically have a google search/stack exchange window open all the time.

```
In [103]: plotMyPolynomial()
```




```
In [104]:
```

7) Write a function `whatShouldIWear()` that takes a temperature, and recommends if you should wear pants or shorts. Critically, you should write this function with another student. This is to get you to figure out dropbox or whatever other file sharing you need. Typical output would be "`Carol and Bob recommend you wear pants`", where Carol and Bob are the names of the students who wrote it. Show a screenshot showing your code.

```
'''7)'''
def whatShouldIWear(temperatureFahrenheit):
    if temperatureFahrenheit < 80:
        clothing = "pants"
    else:
        clothing = "shorts"
    return "Aether and Paul recommend you wear {}".format(clothing)
```

```
In [104]: whatShouldIWear(87.7)
Out[104]: 'Aether and Paul recommend you wear shorts'

In [105]: whatShouldIWear(73)
Out[105]: 'Aether and Paul recommend you wear pants'

In [106]: whatShouldIWear(79.9+0.09+0.009+0.0009)
Out[106]: 'Aether and Paul recommend you wear pants'

In [107]:
```

8) Show a screenshot showing that your Labjack is installed, working, and talking to Python

Full codes:

```
# -*- coding: utf-8 -*-
"""
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Aether Zhou
Week 1
"""

import matplotlib.pyplot as plt
import numpy as np


'''1)'''
def temperatureConvert(degreesCelsius):
    return degreesCelsius*9/5+32

'''3)'''
def temperatureConvertPrintsThrice0(degreesCelsius):
    return "%s degrees Celsius is %.1f degrees Fahrenheit." %
(degreesCelsius, temperatureConvert(degreesCelsius))

def temperatureConvertPrintsThrice1(degreesCelsius):
    return "{} degrees Celsius is {:.1f} degrees
Fahrenheit.".format(degreesCelsius,
temperatureConvert(degreesCelsius))

def temperatureConvertPrintsThrice2(degreesCelsius):
    return f"{degreesCelsius} degrees Celsius is
{temperatureConvert(degreesCelsius):.1f} degrees Fahrenheit."

def temperatureConvertPrintsThrice(degreesCelsius):
    return str(degreesCelsius)+' degrees Celsius is
'+str(temperatureConvert(degreesCelsius))+' degrees Fahrenheit'

'''4)'''
def myPolynomial(x):
    return 2*x**2-3*x+2

'''5)'''
def addOddsToNWithFor(n):
    oddSum = 0
    for oddNum in range(1,n,2):
```

```
        oddSum += oddNum
    return oddSum

def addOddsToNWithWhile(n):
    oddSum = 0
    if n%2 == 0:
        oddNum = n-1
    else:
        oddNum = n-2
    while oddNum > 0:
        oddSum += oddNum
        oddNum -= 2
    return oddSum

def addOddsToNWithNumPy(n):
    oddSum = 0
    for oddNum in np.arange(1,n,2):
        oddSum += oddNum
    return oddSum

'''6)'''
def plotMyPolynomial():
    xValue = np.arange(-5.0, 5.0, 0.01)
    yValue = myPolynomial(xValue)

    fig, ax = plt.subplots()
    ax.plot(xValue, yValue)

    ax.set(xlabel='x', ylabel='f(x)', title='f(x)=2*x^2-3*x+2')
    ax.grid()

    plt.show()

'''7)'''
def whatShouldIWear(temperatureFahrenheit):
    if temperatureFahrenheit < 80:
        clothing = "pants"
    else:
        clothing = "shorts"
    return "Aether and Paul recommend you wear {}".format(clothing)
```