```
# DWAYNE FRASER

############### Problem 4. Function Visualization ################################

import math
import numpy as np
import matplotlib.pyplot as plt

# Defines Plot Function
def plot_function(fun_str, domain, ns):

    # Computes x-list
    interval = (domain[1] - domain[0]) / ns
    xs = []
    for i in range(ns):
        xs.append(domain[0] + interval * i)

    # Computes y-list
    ys = []
    for x in xs:
        y = eval(fun_str)
        ys.append(y)

    # Displays Values
    print("x           y")
    print("------------------")
    for i in range(ns):
        print('{:.3f}       {:.3f}'.format(xs[i],ys[i]))

    # Displays Graph
    plt.xlabel('X')
    plt.ylabel('y')
    plt.title(fun_str)
    plt.plot(xs, ys, color='blue', marker= 'o')
    plt.show()

# Gets User Input
fun_str = input('Enter function with variable x: ')
ns = int(input('Enter number of samples: '))
xmin = float(input('Enter xmin: '))
xmax = float(input('Enter xmax: '))
domain = xmin, xmax

plot_function(fun_str, domain, ns)
```

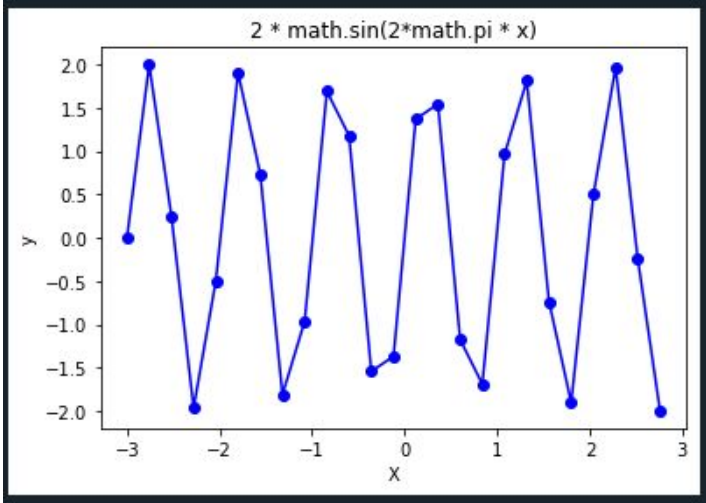
```
In [1]: runfile('C:/Program Files (x86)/Work/Python/Python Dwayne Solutions/HW 1/p4_Fraser_Dwayne.py', wdir='C:/Program Files (x86)/Work/Python/Python Dwayne Solutions/HW 1')

Enter function with variable x: 2 * math.sin(2*math.pi * x)

Enter number of samples: 25

Enter xmin: -3

Enter xmax: 3
x            y
------------------
-3.000       0.000
-2.760       1.996
-2.520       0.251
-2.280       -1.965
-2.040       -0.497
-1.800       1.902
-1.560       0.736
-1.320       -1.810
-1.080       -0.964
-0.840       1.689
-0.600       1.176
-0.360       -1.541
-0.120       -1.369
0.120       1.369
0.360       1.541
0.600       -1.176
0.840       -1.689
1.080       0.964
1.320       1.810
1.560       -0.736
1.800       -1.902
2.040       0.497
2.280       1.965
2.520       -0.251
2.760       -1.996
```




```
In [2]:
```