CS 3430 Assignment 2   (5 points)

Implement Newton - Raphson Approximation in Python.

The Newton–Raphson method in one variable is implemented as follows:

Given a function f defined over the reals x, and its derivative f', we begin with a first guess x_0 for a root of the function f. Provided the function satisfies all the assumptions made in the derivation of the formula, a better approximation x_1 is

$$x_1 = x_0 - \frac{f(x_0)}{f'(x_0)}.$$

Geometrically, $(x_1, 0)$ is the intersection with the x-axis of the tangent to the graph of f at $(x_0, f(x_0))$.

The process is repeated as

$$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$$

until a sufficiently accurate value is reached.

Find successively better approximations to the roots of the following two functions:

1) $f(x)=x^3-2x-5$ given f '(x)=$3x^2$-2 and Initial guess 2

2) $f(x)=x^6-2$ given f '(x)=$6x^5$ and Initial guess 1

Go through the following youtube videos to understand the details of the assignment.

Part 1: http://www.youtube.com/watch?v=avWArTrfTfs

Part 2: http://www.youtube.com/watch?v=z1p1Mp5tRns

Part 3: http://www.youtube.com/watch?v=0IArfHWtIqE

Part 4: http://www.youtube.com/watch?v=v-mjknDigXo

Submit your .py files after packaging them as a zip file.

The name of the file to be submitted should have the following pattern:

firstname_lastname_HW2.zip

References: http://en.wikipedia.org/wiki/Newton%27s_method