UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
School of Computational and Applied Mathematics

Numerical Methods
Lab 4

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Instructions

- Read all the instructions carefully.
- MATLAB has a help file for every function if you get stuck.
- There are also numerous sources available on the internet, Google is your friend!

SECTION 1

Main Exercises

1.1

Exercise 1

Program the Newton's Divided Difference for Interpolation. Your function should take as two inputs, some x column vector and some y column vector (the respective y measurement of x). Your function should also output two variables. The variable `co` as a row vector giving the coefficients of the Newton Polynomial and `T`, a matrix containing the divided difference values only - you may assume this to be lower or upper triangular in nature and thus pad the matrix with zeros where necessary. The first line of your function should look like:

```
function [co,T] = NewtonInterp(x,y)
```

1.2

Exercise 2

Modify your code in Exercise 1 so that it can take in vector xq whose coordinates are the query points. That is, interpolate at certain values of x, and return the approximate values yq at the query points xq. The first line of your function should look like:

```
function yq = NewtonInterp2(x,y,xq)
```