

Assignment 1 (Due Friday 29^h August):

Task: Use your code from Lab 2 to create a python routine to find **all zeros** of a function within a given range. To do this you should use the **bracketing** and **secant** methods, as separate functions, from Lab 2.

Details:

You should create a function **findallzeros** that can be called in the following way (see **testfile1.py**)

```
import numpy as np
import mysearch as mys

def f(x):
    return (x-0.7)*(x+0.5)

a = -2
b = 2
tol = 1e-8
zlist = mys.findallzeros(f,a,b,tol)
print('Zeros found: ',zlist)
```

The function **findallzeros** should therefore be contained within your own **mysearch.py** module. The output to **findallzeros** should be a list of floats that correspond to the zeros that are found (see **output1.txt**). E.g.

```
In [5]: run testfile1.py
Zeros found:  [-0.49999999999999994, 0.699999999999999954]

In [6]: |
```

If no zeros are found the list should be empty.

Important notes:

The module must work on the first try, and for an arbitrary function as an input. If it does not then marks will be deducted.

Try to make you code as robust as possible so that it does not miss any zeros. You may have to modify your bracketing procedure to do this.

Files to submit:

You should upload (only) the following files:

mysearch.py - a python module that contains the **findallzeros** function, as well as any other functions that it needs to run

Grading:

The code will be graded according to the following scale:

Compliance: This is whether the code is submitted as instructed, runs without errors and returns an answer	40%
Effectiveness (i.e. whether the code passes independent tests):	60%