EEE102
Seatwork 02

Instructions: Attached in this document is a screenshot of a working python implementation of the bisection method. Given this, do the following:

1. Copy this exact code and save it as *bisection.py.*
2. Modify the function f(x) to solve for $f(x) = 5x^3 - 5x^2 + 6x - 2$.
3. Add a code that checks if the root is within the guess interval. If the root is present, **proceed** with the bisection method, if not, **terminate** the program.
4. Stopping error should be **0.01%**.
5. The number of iterations should also be counted. Print this number after the root is determined.
6. Implement all instructions above using **false-position** method. Save it as *fp.py.*

Deliverables: 2 files (*bisection.py* and *fp.py*)

```
1    import math
2
3    def f(x):
4        # x^2 cosx
5        return x**2*math.cos(x)
6
7
8    # Bisection Method
9    xu = -4
10   xl = 1
11   es = 0.01
12   xr_old = None
13   root_found = False
14   error = 100
15
16   while root_found is not True:
17       xr = (xu + xl)/2
18       if xr_old is not None:
19           error = abs((xr - xr_old)/xr)
20
21       if f(xl)*f(xr) == 0 or error < es:
22           root_found = True
23       elif f(xl)*f(xr) < 0:
24           xu = xr
25       elif f(xl)*f(xr) > 0:
26           xl = xr
27
28       xr_old = xr
29
30   print('Root: {}'.format(xr_old))
31
```