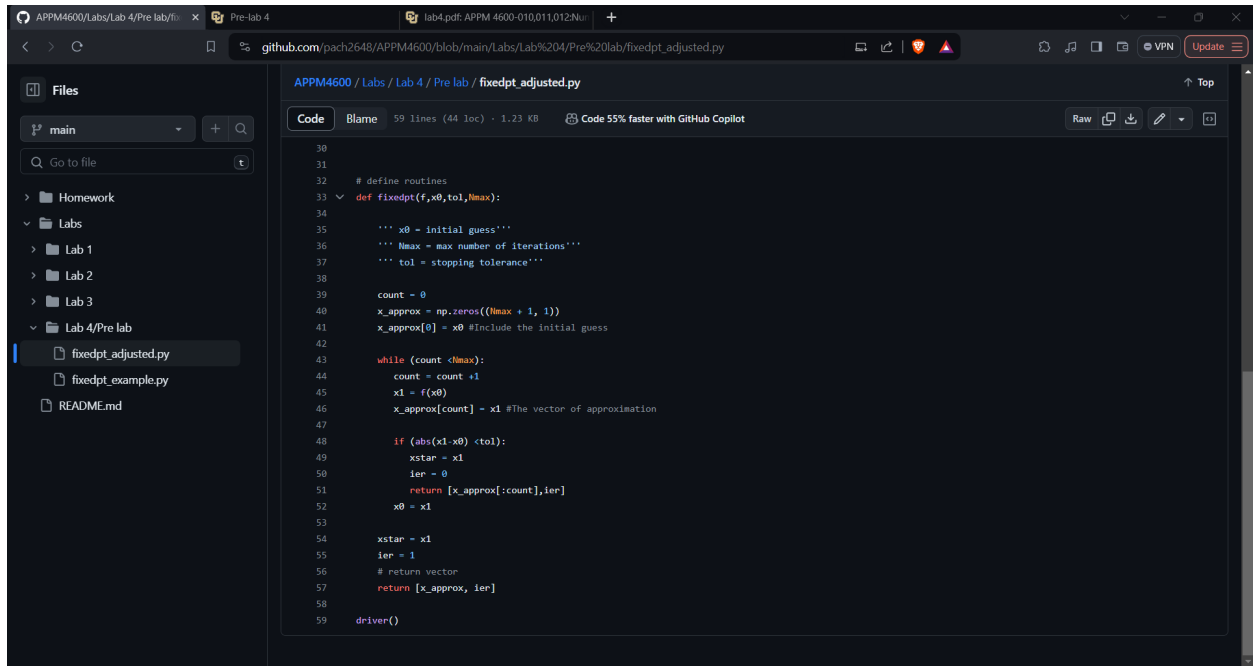


Pre-lab 4

1. Create a new fixed point iteration subroutine that returns a vector whose entries are the approximations of the fixed point at all the iterations in order.



```
30
31
32 # define routines
33 def fixedpt(f,x0,tol,Nmax):
34
35     ''' x0 = initial guess'''
36     ''' Nmax = max number of iterations'''
37     ''' tol = stopping tolerance'''
38
39     count = 0
40     x_approx = np.zeros((Nmax + 1, 1))
41     x_approx[0] = x0 #Include the initial guess
42
43     while (count < Nmax):
44         count = count + 1
45         x1 = f(x0)
46         x_approx[count] = x1 #The vector of approximation
47
48         if (abs(x1-x0) < tol):
49             xstar = x1
50             ier = 0
51             return [x_approx[:count],ier]
52         x0 = x1
53
54     xstar = x1
55     ier = 1
56     # return vector
57     return [x_approx, ier]
58
59 driver()
```

Github link:

https://github.com/pach2648/APPM4600/blob/main/Labs/Lab%204/Pre%20lab/fixedpt_adjusted.py