**SECANT METHOD**

**X0,X1,X2,FX0,FX1,FX2=[],[],[],[],[],[]**

**from pandas import DataFrame**

**def f(x):**

**return (8\*x\*\*3)-(6\*x\*\*2)-(261\*x)+378**

**w1=0**

**while(w1==0):**

**xo=float(input('Enter xo:'))**

**x1=float(input('Enter x1:'))**

**E=float(input('Enter allowed error:'))**

**if (abs(f(xo))<=E):**

**print('The root is xo=',xo)**

**if (abs(f(x1))<=E):**

**print('The root is x1=',x1)**

**else:**

**w1=1**

**w2=0**

**while(w2==0):**

**x2=xo-((f(xo)\*(x1-xo))/(f(x1)-f(xo)))**

**X0.append(xo)**

**X1.append(x1)**

**X2.append(x2)**

**FX0.append(f(xo))**

**FX1.append(f(x1))**

**FX2.append(f(x2))**

**if (abs(f(x2))<=E):**

**print('The root is=',x2)**

**w2=1**

**else:**

**xo=x1**

**x1=x2**

**df=DataFrame({'X0':X0,'X1':X1,'X2':X2,'FX0':FX0,'FX1':FX1,'FX2':FX2})**

**print(df)**

**OUTPUT**

**Enter xo:100**

**Enter x1:-100**

**Enter allowed error:0.000000000001**

**The root is= 1.4999999999999998**

**X0 X1 X2 FX0 FX1 FX2**

**0 100 -100 0.747714 7.914278e+06 -8.033522e+06 1.828363e+02**

**1 -100 0.747714 0.745422 -8.033522e+06 1.828363e+02 1.834246e+02**

**2 0.747714 0.745422 1.460299 1.828363e+02 1.834246e+02 8.979613e+00**

**3 0.745422 1.460299 1.497097 1.834246e+02 8.979613e+00 6.534123e-01**

**4 1.460299 1.497097 1.499985 8.979613e+00 6.534123e-01 3.399141e-03**

**5 1.497097 1.499985 1.500000 6.534123e-01 3.399141e-03 1.314126e-06**

**6 1.499985 1.500000 1.500000 3.399141e-03 1.314126e-06 2.614797e-12**

**7 1.500000 1.500000 1.500000 1.314126e-06 2.614797e-12 5.684342e-14**