Considering..

x=2,

y=3,

eta=3,

iter=1,

epoch=100

**ITERATION-1:**

At x=2 d(x,y)/dx=6x

=6(2)

=12

At y=5 d(x,y)/dy=-5e^(-3)

=-0.2489

delta(x)=-eta\*derivate

=-0.01\*0.12=-0.12

x=x+delta(x)

=2-0.12

=1.88

delta(y)=-eta\*derivate

=-0.01\*-0.25

=0.025

x=x+delta(y)

=3+0.0025

=3.0025

**ITERATION-2:**

At x=1.88 d(x,y)/dx=6x

=6(1.88)

=11.28

At y=3.0025 d(x,y)/dy=-5e^(-3.0025)

=-0.248

delta(x)=-eta\*derivate

=-0.01\*11.28=-0.1128

x=x+delta(x)

=1.88-0.1128

=1.76

delta(y)=-eta\*derivate

=-0.01\*-0.25

=0.025

x=x+delta(y)

=3.0025+0.00248

=3.00498

**PYTHON CODE :**

import math

x\_o=2

y\_o=3

eta=0.01

max\_iterations=100

iterations=1

eps=100

del\_x=1

del\_y=1

def deriv(x,y):

x\_deriv=6\*(x)

y\_deriv=-5\*math.exp(-y)

return x\_deriv,y\_deriv

while max(abs(del\_x),abs(del\_y))<eps and iterations<max\_iterations:

prev\_x=x\_o

prev\_y=y\_o

del\_x,del\_y=deriv(prev\_x,prev\_y)

del\_x=-eta\*del\_x

del\_y=-eta\*del\_y

x\_o=x\_o+del\_x

y\_o=y\_o+del\_y

iterations=iterations+1

print("iterations",iterations,"\n x value is",x\_o,"\n y value is",y\_o)

print("the local minimum occurs at",x\_o,y\_o)