Assignment2:-

$f(x,y) = x^2 + y^2 + 10$

1) $x = -1$, $y = 1$, $\eta = 0.01$, epochs = 2

2) itr = 1

3) $\dfrac{\partial f}{\partial x} = 2x = 2(-1) = -2$

$\dfrac{\partial f}{\partial y} = 2y = 2(1) = 2$

4) $\Delta x = -\eta \dfrac{\partial f}{\partial x} = -(0.01)(-2) = 0.2$

$\Delta y = -\eta \dfrac{\partial f}{\partial y} = -(0.01)(2) = -0.2$

5) $x = x + \Delta x$, $y = y + \Delta y$

$= -1 + 0.2$, $= 1 + (-0.2)$

$= -0.8$, $= 0.8$

6) itr = 1 + 1 = 2

7) if $(2 > 2)$ x

$\llcorner$ 3) $\dfrac{\partial f}{\partial x} = 2x = 2(-0.8) = -1.6$

$\dfrac{\partial f}{\partial y} = 2y = 2(0.8) = 1.6$

4) $\Delta x = -\eta \dfrac{\partial f}{\partial x} = -(0.01)(-1.6)$

$= 0.016$

$\Delta y = -\eta \dfrac{\partial f}{\partial y} = -(0.1)(1.6)$

$= -0.16$

5) $x = x + \Delta x$, $y = y + \Delta y$

$\quad\quad = -0.8 + 0.16 \quad\quad = 0.8 + (-0.16)$

$\quad\quad = -0.64 \quad\quad\quad\quad = 0.64$

6) $9 + x = 2 + 1 = 3$

7) if $(3 > 2)$ ✓

8) $x = -0.64$, $y = 0.64$