**K) Gradient Descent Method**

import numpy as np

def f(x, y):

return x\*\*2 + y\*\*2 - x\*y + x - y + 1

def grad\_f(x, y):

df\_dx = 2\*x - y + 1

df\_dy = 2\*y - x - 1

return np.array([df\_dx, df\_dy])

def gradient\_descent(learning\_rate=0.1, num\_iterations=1000):

x, y = 0, 0 # Initial guess

for \_ in range(num\_iterations):

gradient = grad\_f(x, y)

x -= learning\_rate \* gradient[0]

y -= learning\_rate \* gradient[1]

return x, y

x\_min, y\_min = gradient\_descent()

print(f"Minimum at x = {x\_min}, y = {y\_min}")