Exercise : 8

Find the hessian matrix for $f(x,y) = x^4 + x^2y^2 + y^3$

Hint:

Suppose if we have $f(x,y)$

we already know Jacobian for $f(x,y)$

$$J = \begin{bmatrix} \frac{\partial f}{\partial x} & \frac{\partial f}{\partial y} \end{bmatrix}$$

Hessian matrix : $$H = \begin{bmatrix} \frac{\partial^2 f}{\partial x^2} & \frac{\partial^2 f}{\partial y \partial x} \\ \frac{\partial^2 f}{\partial x \partial y} & \frac{\partial^2 f}{\partial y^2} \end{bmatrix}$$