$$f(x,y) = x \sin y$$

$$f_x(x,y) = \sin y \quad , \quad f_y(x,y) = x \cos y$$

Gradient vector $\nabla f(x,y) = \langle f_x(x,y) , f_y(x,y) \rangle$

$$f_x(2,0) = \left.\frac{\partial f}{\partial x}\right|_{(x,y)=(2,0)} = 0 \quad , \quad f_y(2,0) = 2$$

$$\nabla f(2,0) = \langle 0 , 2 \rangle$$

$\bar{x} = (x, y)$

$\bar{x}^0 = (a, b)$

$(\Delta x, \Delta y) = (x - a, y - b) = \bar{x} - \bar{x}^0$

$\Delta f = f(\bar{x}) - f(\bar{x}^0)$, $df = \nabla f(\bar{x}^0) \cdot (\bar{x} - \bar{x}^0)$

$f(x_1, x_2, \dots, x_n) = f(\bar{x})$, $\bar{x} = (x_1, x_2, \dots, x_n)$

$\bar{x}^0 = (x_1^0, x_2^0, \dots, x_n^0)$

$\Delta f = f(\bar{x}) - f(\bar{x}^0)$, $df = \nabla f(\bar{x}^0) \cdot (\bar{x} - \bar{x}^0)$

Linear approx : $\Delta f \approx df$

Afstand mellem (x_1, y_1) og (x, y)

$$f(x,y) = \sqrt{(x-x_1)^2 + (y-y_1)^2}$$

$$f_x(x,y) = \frac{1}{2\sqrt{(x-x_1)^2 + (y-y_1)^2}} \cdot 2(x-x_1) = \frac{x-x_1}{\sqrt{(x-x_1)^2 + (y-y_1)^2}}$$

$$= \frac{x-x_1}{f(x,y)}$$

$$f_y(x,y) = \frac{y-y_1}{f(x,y)}$$

Foreløbig værdi $\bar{x}^0$

Find lineariseret ligningssystem

$$A(\bar{x} - \bar{x}^0) = \bar{b}$$

Find mindste kvadraters løsning

$$\hat{x}^1 = \bar{x} - \bar{x}^0$$

$$\bar{x}^1 := \bar{x} = \bar{x}^0 + \hat{x}^1$$

Gentag med $\bar{x}^0$ erstattet af $\bar{x}^1$. Find $\bar{x}^2$

Gentag med $\bar{x}^0$ erstattet af $\bar{x}^2$. Find $\bar{x}^3$