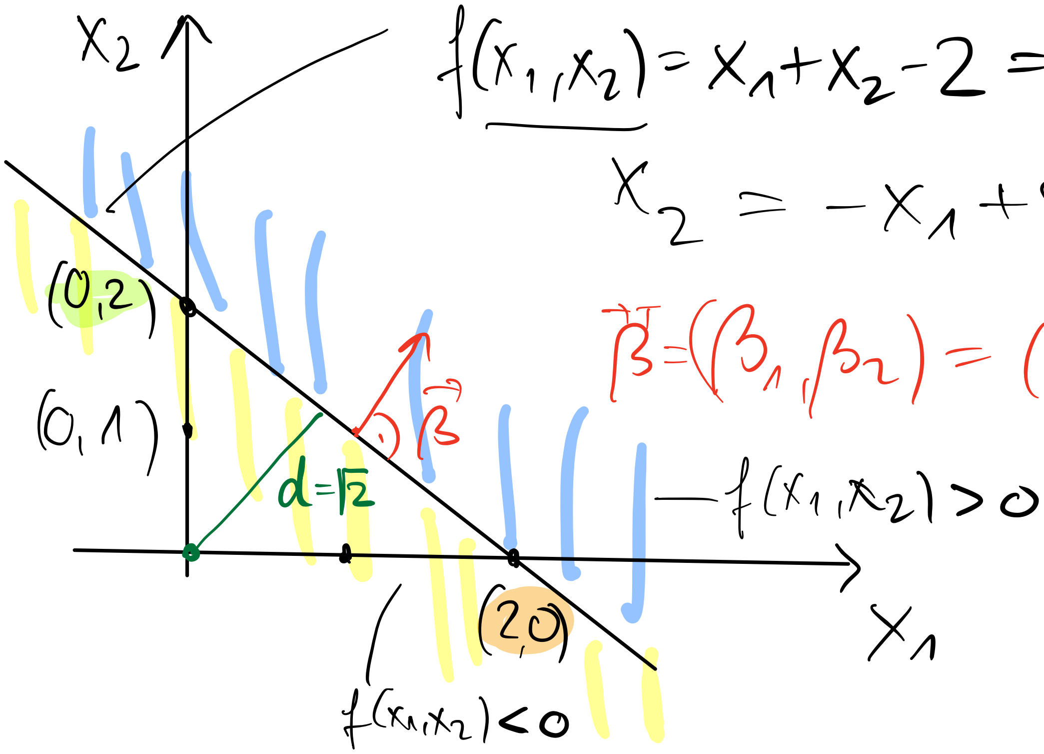
$$f(x_1,x_2) = x_1 + x_2 - 2 = 0$$

$$x_2 = -x_1 + 2$$

$$\vec{\beta}^T = (\beta_1, \beta_2) = (1,1)$$



$$f(2,0) = 2 + 0 - 2 = 0 \checkmark$$

$$f(0,2) = 0 + 2 - 2 = 0 \checkmark$$

$$(\beta_1, \dots, \beta_p)$$

<u>If</u> $\sum_{i=1}^{p} \beta_i^2 = 1$

<u>Then</u> $\beta_0 + \beta_1 X_1 + \dots + \beta_p X_p$ is the distance to the plane

$$\beta_1 = \beta_2 = 1$$

$$\sqrt{\beta_1^2 + \beta_2^2} = \sqrt{2}$$

$$\Rightarrow \quad f(x_1, x_2) = \frac{1}{\sqrt{2}} x_1 + \frac{1}{\sqrt{2}} x_2 - \frac{\overbrace{2}^{\sqrt{2}}}{\sqrt{2}} = 0$$

$$= \frac{1}{\sqrt{2}} x_1 + \frac{1}{\sqrt{2}} x_2 + \sqrt{2} = 0$$

$f(0,0) = \sqrt{2}$ $\Rightarrow$ distance of hyperplane to the origin