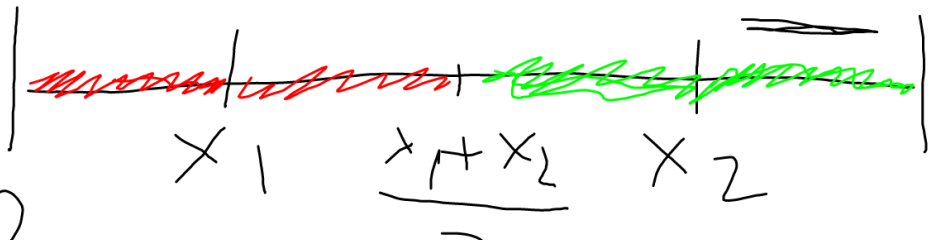
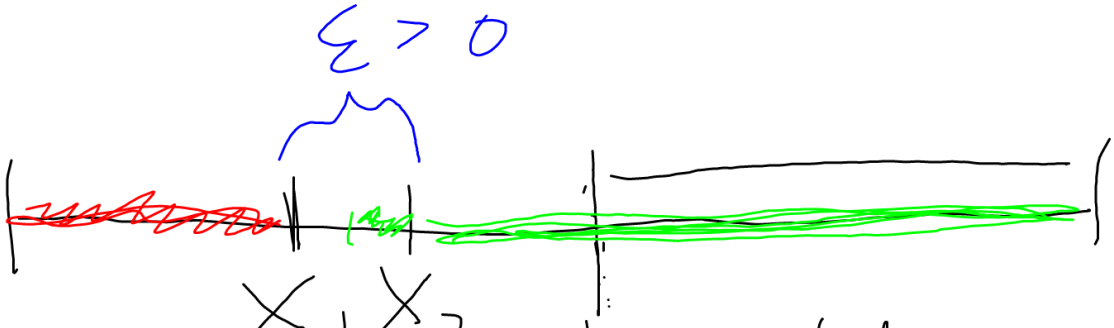


w.l.o.g. $x_2 \geq x_1$

$$u_1(x_1,x_2) = x_1 + \frac{x_2-x_1}{2}$$

$$u_2(x_1,x_2) = 1-x_2+\frac{x_2-x_1}{2}$$



if $x_1 = x_2$

$u_2(x_1,x_2) = \frac{1}{2}$

if $x_1 < \frac{1}{2}$

Assume $x_2 > x_1$

$x_2 = x_1 + \varepsilon$

$$u_2(x_1,x_2) = \frac{1}{2} + \frac{1}{2} - x_1 - \varepsilon + \frac{\varepsilon}{2}$$

$$= \frac{1}{2} + \left(\frac{1}{2} - x_1 - \frac{\varepsilon}{2}\right)$$

> 0 for small $\varepsilon > 0$

$$x_2^* = \begin{cases} x_1 + \varepsilon & x_1 < \frac{1}{2} \\ x_1 - \varepsilon & x_1 > \frac{1}{2} \\ x_1 & x_1 = \frac{1}{2} \end{cases}$$

Same for x_1^*

$$(\tilde{x}_1, \tilde{x}_2) = \left(\frac{1}{2}, \frac{1}{2}\right)$$