- Parents:

$$x_1 \ x_2 \ x_3 \ x_4 \cdots x_k \cdots x_n$$

$$y_1 \ y_2 \ y_3 \ y_4 \cdots y_k \cdots y_n$$

- Select a single gene k at random

- children are created as

$$x_1 \cdots x_{k-1} \quad \overset{\alpha}{} y_k + \overset{\beta}{} x_k, \ \cdots \ x_n$$

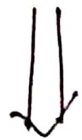$$y_1 \cdots y_{k-1} \quad \alpha x_k + \beta y_k, \cdots \ y_n$$

where α and β are constant values

For example:

$$\alpha = 0.5 \ (\text{may be positive}/\text{negative})$$

$$\beta = 0.6 \xrightarrow{\quad k = 4 \quad} (\text{may be positive}/\text{negative})$$

X:	0.5	0.7	0.6	(0.4)	0.3
Y:	0.1	0.2	0.4	(0.5)	0.3

After Cross over

X:	0.5	0.7	0.6	0.49	0.3
Y:	0.1	0.2	0.4	0.50	0.3

$$0.5 * 0.5 + 0.6 * 0.4 = 0.25 + 0.24 = 0.49$$

$$0.5 * 0.4 + 0.6 * 0.5 = 0.20 + 0.30 = 0.50$$