

$\text{rec} : I^\mu \rightarrow I$, $\text{rec} = \text{re} \circ \text{co}$

- Creates one individual per application.
- Works according to:
 - $\text{co} : I^\mu \rightarrow I^\rho$
Chooses ρ parents at random. e.g. $\rho=2$
 - $\text{re} : I^\rho \rightarrow I$
Creates one offspring individual.
- Common cases:
 - $\rho = 2$ bisexual recombination.
 - $\rho = \mu$ global recombination ("gene pool recombination").

Recombination types:

- No recombination, i.e., rec performs just a random choice of an individual.
- Global intermediary recombination:

$$b'_i = \frac{1}{\rho} \sum_{k=1}^{\rho} b_{k,i}$$

(Averaging over all parents).

- Local intermediary recombination:

$$b'_i = u_i b_{k_1,i} + (1 - u_i) b_{k_2,i}$$

$u_i \sim U([0, 1])$ or $u_i = 1/2$

$k_1, k_2 \sim U(\{1, \dots, \rho\})$ for each offspring.

- Discrete recombination:

$$b'_i = b_{k_i,i}$$

$k_i \sim U(\{1, \dots, \rho\})$ at random for each i .

b stands for $\{x, \sigma, \alpha\}$