NIM GAME

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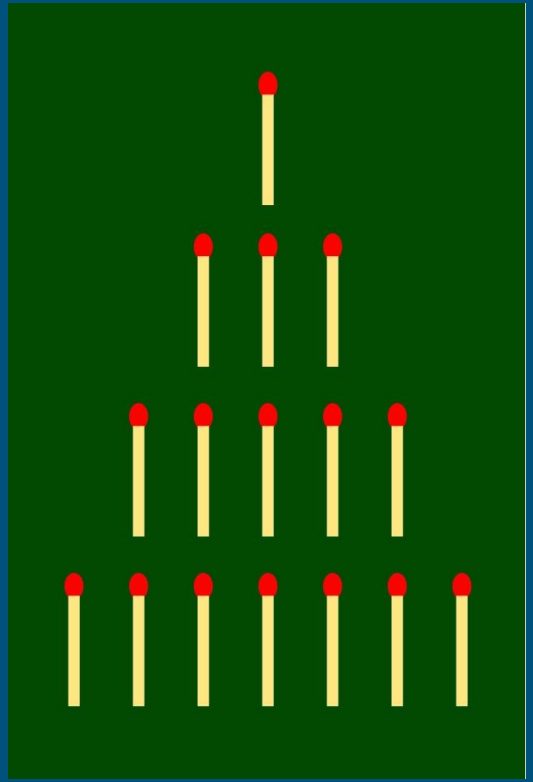
Context

Nim Game :

- At each turn you can take as many item from one row as you want.

- The player who takes the last one loses



What is an individual in this context?

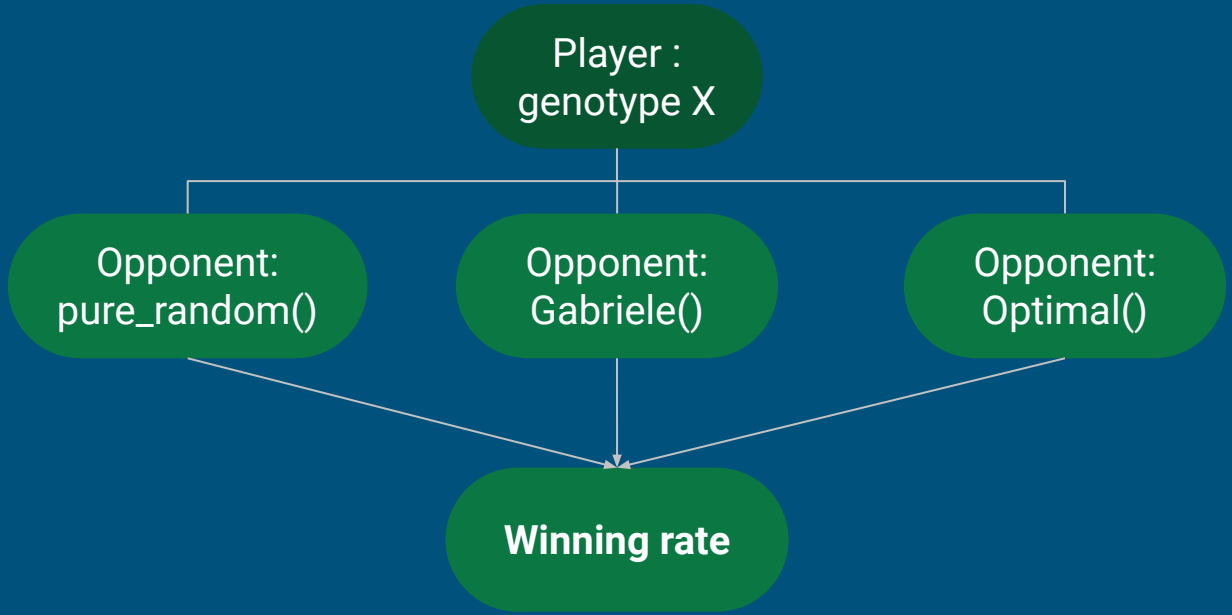
- **Genotype :** A list of probabilities where each element of the list represents the probability of using a certain strategy at each move (can use different strategies within a game)

```
list_strategies =[pure_random, gabriele, optimal]
genotype        =[ 0.3       ,   0.1   ,   0.6  ]
```

- **Fitness:** Calculates the rate of winning the game after N tries when the player uses a specific genotype against an opponent who plays with different strategies in every try.

Fitness function explained

- **Who plays first? ⇒ It alternates between the 2 players in every match**
- **Number of matches ⇒ Fixed parameter to 20 matches for each individual (can be modified)**

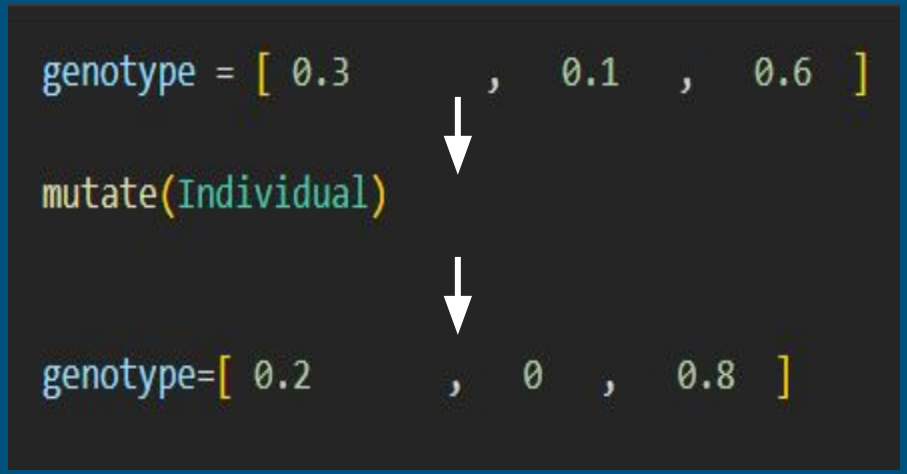


Offspring

- The selection of the parents is random.
- The survivor is the parent who has the best fitness.
- Each survivor of the offspring list has a probability of 80% to mutate

Mutation

- The function *mutate (Individual)* modifies randomly the genotype of an individual by changing the rate of using one of the strategies:



les offspring

les mutations

le nombre de generation