Genetic algorithms, a sort of algorithms belonging to a more general category, so called meta-heuristics, know today a great expansion in terms of target applications, including biology, chemistry and medicine. They are inspired from primary observations in nature (Lamarck, 1809; Darwin, 1859; Mendel, 1865; Fisher, 1918), and started with simulation of artificial selection of organisms with multiple loci that controls a measurable trait (Fisher, 1957). Genetic algorithms evolved into complex and strong informatics tools capable to deal with hard problems of decision, classification, optimization, and simulation in fields as biology, chemistry, and medical engineering. They introduce genetic algorithms and produce genetic algorithms with respect for properties of the present day algorithms, also important results reported in the literature about the use of genetic algorithms for phylogenetic and gene sequence analysis is discussed.

Genetic algorithms - it realizes an evolution of individuals from a population by iterative generations:

- D3 - to select offspring
- D4 - assess fitness
- D5 - then choose (random or determinist) genes for mutation (offspring's) obtaining
- D6 - decide (using a low probability) if mutation applies to a offspring
- D7 - construct a fitness score function
- D8 - construct a transformation between a chromosome (genotype) and a individual (phenotype)
- D9 - choose a fitness score function
- D10 - establish the condition for a solution to be a good one (stop condition)
- D11 - build an initial population (random or deterministic) of genotypes
- D12 - repeat the selection process (offspring's) obtaining
- D13 - do crossover of the selected individuals (offspring's) obtaining
- D14 - do selection to pick up 2 (or more) individuals
- D15 - until at least one phenotype satisfies an imposed condition (usually of fitness)