Evolutionary Algorithms: Questions to think about

1. Is it always good to select the best individuals of your population? Why? Give an example.

2. Comment how the size of your search space should be taken into account when you decide the size of your population.

3. Should the size of your population always be the same during the whole optimisation process? In which case including new random solutions would benefit your performance?

4. Advantages and disadvantages of selecting almost randomly the members of your population to mate.

5. In slide 5 of 'Evolutionary Algorithms: Details, Encoding, Operators' speaks about pressure. Why does the level of pressure affect the optimum you end up in this example?

6. What is the relationship created between pressure and diversity? Which one you should consider more in your algorithm and which factors would you take into account to decide that?

7. In rank with bias, what is the role of the bias? How does this factor affect the diversity and the pressure?

8. Same question for the tournament size in the tournament selection method.

9. How is a steady state updating method useful according to the size of the search space? How does this affect the diversity?

10. In generational-with-elitism, what are the consequences of using a small amount of individuals from previous generations?

11. You have to optimise a problem that requires a short-time answer using EA. Since EA can take a significant amount of time to evolve, which configuration would you choose to customise your algorithm for this environment?

12. In M-random-gene mutation, give an example when using a certain value of M your algorithm is transformed in a random search.

13. What are the consequences of removing the crossover operator from your algorithm? How can you alleviate that?
14. Differences between random mutation and normally distributed mutation. Can you think of examples where these two methods are a suitable strategy to implement?