

INSTITUTO POLITÉCNICO NACIONAL

ESCUELA SUPERIOR DE CÓMPUTO

EVOLUTIONARY COMPUTING

SWARN INTELLIGENCE

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Read the document by Krause et al. and answer the following.

1. *What are the elements of Swarm Intelligence?*  
A group of partially independent individuals receive information and combine it through social interaction to solve the problem. Enables grouping individuals to solve a cognitive problem, then the way in which this is done (information processing through interaction) is unique to grouping and cannot be implemented by singletons (even if they are capable of solving the problem in other ways).
2. *What is Self Organization?*  
It can be defined as individuals following local behavioral rules, resulting in organized behavior by the whole group without the need for global control.
3. *Provide an example where Swarm Intelligence can be useful.*  
To make predictions about certain events and to solve the classical shortest path problems and large dataset clustering problems.
4. *Provide an example where Swarm Intelligence cannot be useful.*  
In problems that tend to change, even a small change in the simple rules results in different group level behaviour.
5. *Why is learning important in Swarm Intelligence?*  
This ability could lead to cooperative interaction networks and potentially enable collective solutions to challenging problems to emerge.
6. *Why is signaling important in Swarm Intelligence?*  
They can inform each other effectively without having to make great efforts to distribute information.
7. *List the conditions required for Swarm Intelligence to perform well.*
  - Diversity of opinion.
  - Independence of opinion.
  - An incentive for truthful reporting.
  - If estimates of individuals are only hampered by imprecision and not by a systematic bias.