**Structuring Work**

Tools

1. Few algos to help developers get started with AI.
2. **Heuristics**: searches and guess solution alogs.
3. **[Brute-force](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwjRxeDTo8vaAhVIQo8KHcG5AZIQFggpMAA&url=https%3A%2F%2Fen.wikipedia.org%2Fwiki%2FBrute-force_search&usg=AOvVaw1uq2v2ZmqoU22j4c1J-bYz)** [search good but very slow. Good for 1 Dimension. Finding Min and max values --> not applicable to find probability.](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwjRxeDTo8vaAhVIQo8KHcG5AZIQFggpMAA&url=https%3A%2F%2Fen.wikipedia.org%2Fwiki%2FBrute-force_search&usg=AOvVaw1uq2v2ZmqoU22j4c1J-bYz)
4. **[Hill-Climbing or gradient descent](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwjRxeDTo8vaAhVIQo8KHcG5AZIQFggpMAA&url=https%3A%2F%2Fen.wikipedia.org%2Fwiki%2FBrute-force_search&usg=AOvVaw1uq2v2ZmqoU22j4c1J-bYz)** [only finds the local optimum but not the global optimum.](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwjRxeDTo8vaAhVIQo8KHcG5AZIQFggpMAA&url=https%3A%2F%2Fen.wikipedia.org%2Fwiki%2FBrute-force_search&usg=AOvVaw1uq2v2ZmqoU22j4c1J-bYz) **local search methods**
5. Solving **NPC** problem, graph problem, by **Heuristics** and **Meta Heuristics**. (approx solution)
6. **Hamiltonian cycle** problem (visit every vertex exactly once, determine close cycle
7. ), **Travelling sales man** problem (visit every city and shortest path), **coloring problem**
8. **NP** problem: solution ... not exact but approximation of solution.
9. Construct Heuristics algo according to the problem in hand.
10. **Heuristics** not generic, we use underlying feature of the problem
11. **Meta Heuristics** generic, we not use underlying feature of the problem
12. **Alpha Beta pruning, (Heuristics)**.... solving---- **chess** and **tic-tac-toe;**
13. **min max problem (Heuristics)**
14. **Meta Heuristics** good guess fast. We don't know the underlying problem. **Base theory + Use or several problem**
15. **Generic algorithm, simulated annealing** and **particle swarm optimization (Meta Heuristics)**.
16. **Generic algorithm** --- **Travelling sales man**, neural network, stock market value, recognize faces
17. Tabu Search = **simulated annealing +** underlying data structure. understand bad moves
    * 1. tabu tenure
      2. aspiration criteria