SSN College of Engineering

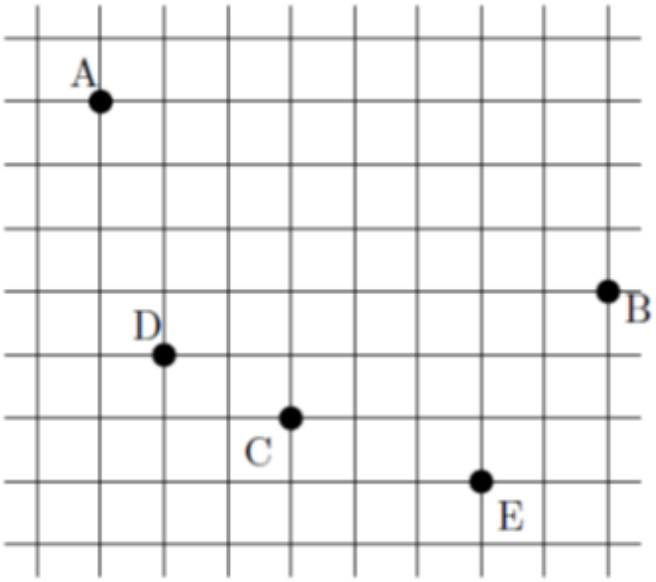
Department of Computer Science and Engineering

CS1504—Artificial Intelligence

Session -04 Local search algorithm

September 08, 2020

1. Centre for a Set of Points
    - Points A, B, C, D, E
    - Find a centre point to these points
    - Total distance of centre from all the points is minimum
    - Implement and test a hill-climbing method to find the centre for the set of points.



- Manhattan distance between $A(x_k, y_k)$ and $V(x_v, y_v)$.

$$d(A, V) = |x_a - x_v| + |y_a - y_v|$$

- Sum of distances of all the points $S = \{A, B, C, D, E\}$.

$$\begin{aligned} D(S, Z) &= \sum_{A \in S} d(A, Z) \\ &= \sum_{A \in S} |x_a - x_v| + |y_a - y_v| \\ &= |x_a - x_v| + |y_a - y_v| + + \ldots + |x_e - x_v| + |y_e - y_v| \end{aligned}$$

- Minimize $\sum_{A \in S} |x_a - x_v| + |y_a - y_v|$

2. Solve 8-queens problem. Place 8 queens in a chessboard so that no queen is under attack from any other queen. One such “safe” configuration of 8 queens is shown below.

	1	2	3	4	5	6	7	8
1				Q				
2						Q		
3								Q
4		Q						
5							Q	
6	Q							
7			Q					
8					Q			

Implement Hill climbing algorithm to find any one safe configuration.