

Hill Climbing Algorithm

Local Search Algorithm,

Greedy Approach

No backtracking

1. Evaluate the initial state

2. Loop until a solution is found or there are no operators left.

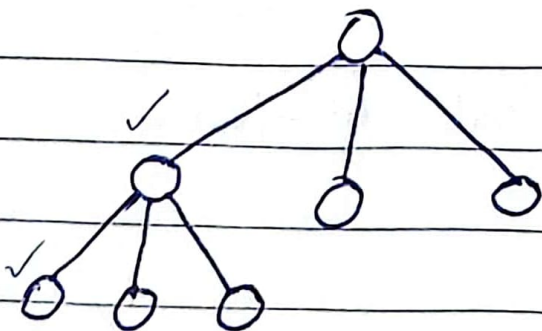
- select and apply a new operator

3. Evaluate the new state

if goal then quit

if better than current state then

It is new current state



Beam width

Best

Cost / Heuristic value

select

Discard other branches

Current state

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

✓ (4)

(5)

(6)

stop

	1	2	4
		5	7
3	6	8	

	1	2	4
5		7	
3	6	8	

	1	2	4
5	6	7	
3			8

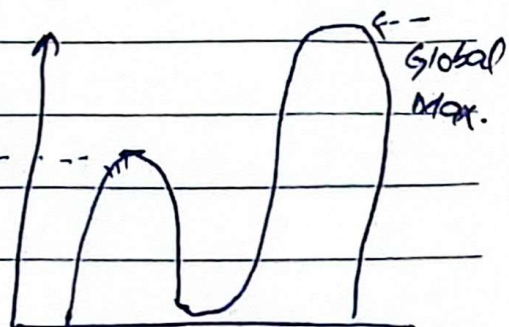
Problems in Hill Climbing

1) Local Maximum

5		2	4
	1	5	7
	3	6	8

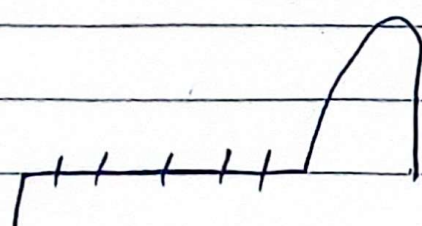
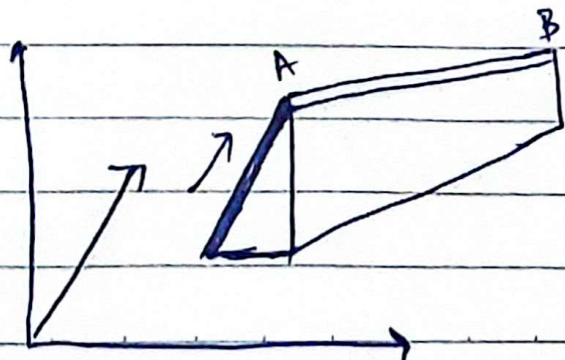
5	1	2	4
	3	5	7
		6	8

current state :-
(there is no better state possible)



3) Ridge

2) Flat Maximum



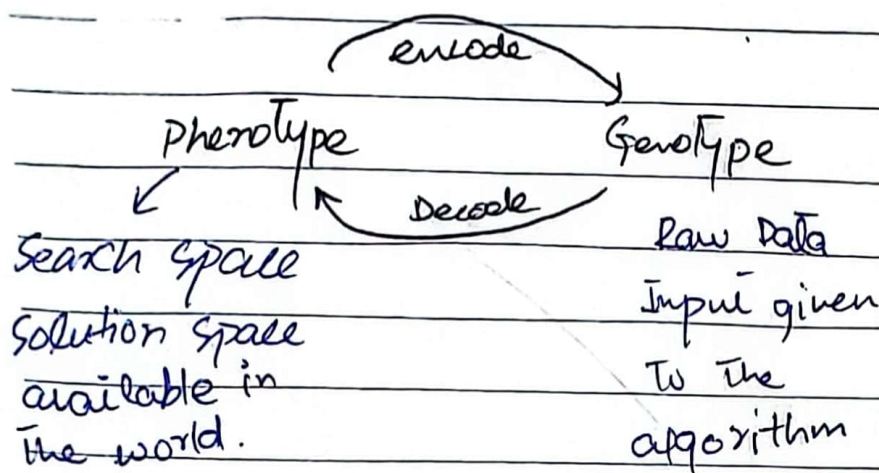
It moves only in 1-D

Genetic Algorithm.

- proposed by John Holland in 1960
- Abstraction of real biological evolution
- Solve complex problems (like NP Hard)
- Focus on Optimization
- Population of possible solutions for given problem.
- From group of individuals, the best will survive.

↳ Chromosome
↳ Thread-like structure

within the nucleus of cell that contains DNA, which carries genes and genetic information.



Population

Diverse Population
Start with a random possible solutions.

Fitness Function

check how good each solution is

Selection

Choose the best solutions.

Crossover

Combine two good solution to create new one

Making a small random change

Mutation

↳ Repeat

do this process again & again until we find the best possible solution

Make
Take
F.S=3