	Topic:
	Assignment - 06 [AIES]
*	Tittle:
	Implement a local search argonthm for
	Implement a local search algorithm for eg: n-queens, chess, 75P
*	Aim i
	Implement hill climbing algorithm for 751
1	Objection :
*	Write a program in c/c++/lython to solve
	the hill climbing algorithm for TSP.
	the had camping as got
Je	Theory :
7	Theory :
1.	Local Search Algorithm
	local search algorithm are optimization
	techniques used to find solutions by
0	engloring the solution space incrementally.
	These algorithms start with an initial
	solution and iteratively make small changes
	to it
	Key Characteristics:
	A STATE OF THE PROPERTY OF THE
	- Focuses on a single current solution.
	- Moves to /a neighbouring solution
	if it in proves the current one.
	- Finds a good solution in a rese reasonable
	time

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2)	Hill Climbing Algorithm
	Hill climbing is a specific type of local
	search algorithm that continuously moves
	towards higher (or lower) values in the
	search space.
	It is an iterative algorithm that
	starts with an arbitary solution and
	makes incremental changes to improve it.
	I a company of the co
3-23	Rey Characteristics:
	- Greedy Approach
	- Simple and easy to implement
	Tupes of Hill Climbing:
	Types of Hill Climbing: - single hill climbing
	- Steepest hill climbing
	- Stonastic hill climbing
	March of the court of parce merchant
*	Input : dies dies / lacelle gentle
S. Carlon	non metrix of distance of TSP.
*	output ;
	An optimal distance between 2 cities
	italor Jasygus St. un Logis (1993)
*	Algorithmi
	Hill Climbing Algorithm
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	and the second s
9.1.	Enplain hill climbing with enample.
\rightarrow	Hill climbing is a specific type of local
	search algorithm that continuously move
1 14	towards higher (or lower) values in the
A	seach space.
	It is a heuristic search technique wed for
	mathematical operation optimization problems.
	Steps of hill climbing algorithm.
	(i) Initialisation
1 /5	(ii) Evaluation
109	(iii) Generate neighbour
	(iv) Select best neighborn
3	(V) More to next best neighbour
	(vi) Check for termination
	2
1/3	Example: f(n): -n2+4n
	(i) Initialize n=0
	(ii) Evaluate:
	f(n=0)= 0 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
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	(iii) Generate neighbour
7	f(n=1) = 3 f(n=1) = 5
	+(*;17.3
- 3	(iv) Thus best neighborn (n = -1)
	(1) Thus best neighborn (1-1)
	(y) Move to n=1
	(y) Move to n=1
- 3	(vi) Repeat step : (iii) - (v)
	reea step i (iii)
, ,	(vii) Here, the algorithm terminates at
	n=2. with max function value f(2)=4
1	The state of the s
0, 2	Explain limitations of hill climbing and
-	solutions to it.
	" the self of the self and there are the self of the s
\rightarrow	limitation; + 1 and wear ment of I, sty leads
	- Hill climbing can get stuck in local optima.
	- Mill climbing can get stuck on plateaus,
	flat areas of the search space where
7	neighbouring points have same value
	- Hill climbing does not consider the
	possibility of backtracking.
	. The quality of final sol" depends heavily
	on starting point
	(i) Lind (i) Color Man
	Solutions to overcome limit attons i
	- Run the algorithm multiple times from
	different vandom starting points.
	- Simulated Annealing

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- Genetic Algorithms: These use principles of natural selection and genetics to search for optimal solutions.

- Beam Search and Tabu Search.

8.3. Solve n queens problem using local search algorithm.

The n queens problem is a chassic Combinatorial problem where the god is to place N queens on an NXN chessboard such that no two queens attack each other.

Steps to solve N-queens problem:

(i) Initialisation: Start with a Yandom placement of n queens on as NXN Chessboard

(ii) Iterate: For a given no of conflicts: - select a queen in this conflict - Move the selected queen to a

position that minimizes the conflict (iii.) Termination:

If no conflicts are present, the solution is found.

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*	Algorithm :
	and the state of t
	def hill-climbing (problem):
	current_solution = problem-initial-solution
	while True:
	neighbourg = problem s. generate
	neighbours
	solution)
	nent_solution= None
	for neighbours in neighbours!
	if problem evaluate (reighbours)>
	problem evaluate (current-soln):
	next_solution = neighbour
	break:
	if nent-solution is None:
	yeturn current solution
	current - solution = nent-solution
	PARTITION OF CONTRACT TO WASHINGTON
*	Conclusion:
	We learned hill climbing algorithm.
64	local search algorithm and TSP
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	(30)
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