Name:	Prerna Sunil Jadhav
Sap Id:	60004220127
Class:	T. Y. B.Tech (Computer Engineering)
Course:	Artificial Intelligence
Course Code:	DJ19CEL503
Experiment No.:	04

AIM: Program to implement Local Search algorithm: Hill climbing search.

OUTPUT:

```
Output

[[], [], [], ['B', 'C', 'D', 'A']]
[['A'], [], [], ['B', 'C', 'D']]
[['A', 'D'], [], [], ['B', 'C']]
[['A'], ['D'], [], ['B', 'C']]
[['A'], ['D'], ['C'], ['B']]
[['A', 'B'], ['D'], ['C'], []]
[['A', 'B', 'C'], ['D'], [], []]
[['A', 'B', 'C', 'D'], [], [], []]
Final state -  [['A', 'B', 'C', 'D'], [], [], []]


Process Finished.
>>>
```

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AIM: Genetic Algorithm

OUTPUT:

ITERATION : 1

SELECTION

Initial	Decimal Value	Fitness Score	Fi/Sum	Expected	Actual
[0, 1, 0, 0, 1]	9	81	0.11	0.43	0
[1, 0, 1, 0, 0]	20	400	0.53	2.12	2
[0, 0, 1, 1, 1]	7	49	0.06	0.26	0
[0, 1, 1, 1, 1]	15	225	0.3	1.19	1

Sum : 755

Average : 188.75

Maximum : 400

CROSS OVER

Population	Mate	Crossover Point	Crossover Population
[0, 1, 0, 0, 1]	2	0	[0, 1, 0, 0, 1]
[1, 0, 1, 0, 0]	1	0	[1, 0, 1, 0, 0]
[0, 1, 0, 0, 1]	4	2	[0, 1, 1, 1, 1]
[0, 1, 1, 1, 1]	3	2	[0, 1, 0, 0, 1]

MUTATION

Mutation population	New Population	Fitness
[0, 1, 0, 0, 1]	9	81
[1, 0, 1, 0, 0]	20	400
[0, 1, 1, 1, 1]	15	225
[0, 1, 0, 0, 1]	9	81

Sum : 787

Maximum : 400

ITERATION : 2

SELECTION

Initial	Decimal Value	Fitness Score	Fi/Sum	Expected	Actual
[0, 1, 0, 0, 1]	9	81	0.1	0.41	0
[1, 0, 1, 0, 0]	20	400	0.51	2.03	2
[0, 1, 1, 1, 1]	15	225	0.29	1.14	1
[0, 1, 0, 0, 1]	9	81	0.1	0.41	0

Sum : 787

Average : 196.75

Maximum : 400

CROSS OVER

Population	Mate	Crossover Point	Crossover Population
[0, 1, 0, 0, 1]	2	0	[0, 1, 0, 0, 1]
[1, 0, 1, 0, 0]	1	0	[1, 0, 1, 0, 0]
[0, 1, 1, 1, 1]	4	2	[0, 1, 0, 0, 1]
[0, 1, 0, 0, 1]	3	2	[0, 1, 1, 1, 1]

MUTATION

Mutation population	New Population	Fitness
[0, 1, 0, 0, 1]	9	81
[1, 0, 1, 0, 0]	20	400
[0, 1, 1, 0, 1]	13	169
[0, 1, 1, 1, 1]	15	225

Sum : 875
Maximum : 400

ITERATION : 3
SELECTION

Initial	Decimal Value	Fitness	Score	Fi/Sum	Expected	Actual
[0, 1, 0, 0, 1]	9	81		0.09	0.37	0
[1, 0, 1, 0, 0]	20	400		0.46	1.83	2
[0, 1, 1, 0, 1]	13	169		0.19	0.77	1
[0, 1, 1, 1, 1]	15	225		0.26	1.03	1

Sum : 875
Average : 218.75
Maximum : 400

CROSS OVER

Population	Mate	Crossover Point	Crossover Population
[0, 1, 0, 0, 1]	2	1	[0, 0, 1, 0, 0]
[1, 0, 1, 0, 0]	1	1	[1, 1, 0, 0, 1]
[0, 1, 1, 0, 1]	4	0	[0, 1, 1, 0, 1]
[0, 1, 1, 1, 1]	3	0	[0, 1, 1, 1, 1]

MUTATION

Mutation population	New Population	Fitness
[0, 0, 1, 0, 0]	4	16
[1, 1, 0, 0, 1]	25	625
[0, 1, 1, 0, 1]	13	169
[0, 1, 1, 0, 1]	13	169

Sum : 979
Maximum : 625

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Experiment No.:	06

AIM: Program to implement learning: Perceptron Learning/Backpropagation Algorithm

OUTPUT:

Iteration 1

Generated Output vector for Iteration 1 : [1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, -1, 1]

Weight vector after Iteration 1 : [0.2, 0.6, 0.0, 0.6, 0.2, -0.9, 0.4, 0.6, -0.6, 0.1, 0.1, -0.1, 0.4, 0.9, -0.9, 0.1, 1.0, -0.3, 1.0, 0.1]

Iteration 2

Generated Output vector for Iteration 2 : [1, 1, 1, 1, 1, 1, 1, 1, 1, 1, -1, -1, -1, 1, -1, -1, -1, -1, -1, -1]

Weight vector after Iteration 2 : [0.1, 0.5, 0.0, 0.5, 0.1, -1.0, 0.4, 0.5, -0.6, 0.0, 0.0, -0.1, 0.3, 0.9, -1.0, 0.0, 1.0, -0.3, 1.0, 0.0]

Iteration 3

Generated Output vector for Iteration 3 : [1, 1, 1, 1, -1, 1, 1, 1, 1, 1, -1, -1, -1, 1, -1, -1, -1, -1, -1, -1]

Weight vector after Iteration 3 : [0.1, 0.4, 0.0, 0.4, 0.0, -1.0, 0.4, 0.4, -0.6, -0.1, 0.0, -0.1, 0.2, 0.9, -1.0, 0.0, 1.1, -0.2, 1.1, 0.0]

Accuracy of Classifier : 90.0 %

Classifying an Unknown Sample of L (Output = 1)

Unknown Sample : [1, 1, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 1, 1, 1, 0]

Predicted Output : 1

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Experiment No.:	07

AIM: Program to implement Family Tree in Prolog

OUTPUT:

```
true.
?- father(X,Y).
X = shankar,
Y = ulhas ;
X = shankar,
Y = satish ;
X = ulhas,
Y = prashant ;
X = satish,
Y = saurabh ;
X = satish,
Y = swati.

?- mother(X,Y).
X = umabai,
Y = ulhas ;
X = umabai,
Y = satish ;
X = mrunal,
Y = prashant ;
X = sadhana,
Y = saurabh ;
X = sadhana,
Y = swati.

?- aunt(X,Y).
X = mrunal,
Y = saurabh ;
X = mrunal,
Y = swati ;
X = sadhana,
Y = prashant ;
X = sadhana,
Y = prashant ;
false.

?- parent(X,Y,Z).
X = shankar,
Y = umabai,
Z = ulhas ;
X = shankar,
Y = umabai,
Z = satish ;
X = ulhas,
Y = mrunal,
Z = prashant ;
X = satish,
Y = sadhana,
Z = saurabh ;
X = satish,
Y = sadhana,
Z = swati.


?- grandfather(X,Y).
X = shankar,
Y = prashant ;
X = shankar,
Y = saurabh ;
X = shankar,
Y = swati ;
false.
```

Shri Vile Parle Kelavani Mandal's
DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING
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Academic Year: 2022-2023

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Course Code:	DJ19CEL503
Experiment No.:	08

AIM: Implementation on any AI Problem: Wumpus world

OUTPUT:

```
Enter the order of the maze: 4

Enter the number of pits: 2

Enter the location of pit 1: 1 4
Enter the location of pit 2: 3 4
Enter the location of wumpus: 2 4
Enter the location of gold: 2 3

Enter the starting location: 1 1

Your Position : *
Wumpus : X Gold : $

Pit : O Initial state:
-  -  -  -
-  -  -  O
-  -  $  X
*  -  -  O

Move 1:
-  -  -  -
-  -  -  O
*  -  $  X
-  -  -  O

Move 2:
-  -  -  -
*  -  -  O
-  -  $  X
-  -  -  O

Move 3:
*  -  -  -
-  -  -  O
-  -  $  X
-  -  -  O

Move 4:
-  *  -  -
-  -  -  O
-  -  $  X
-  -  -  O

Move 5:
-  -  -  -
-  *  -  O
-  -  $  X
-  -  -  O

Move 6:
-  -  -  -
-  -  -  O
-  *  $  X
-  -  -  O

Move 7:
-  -  -  -
-  -  -  O
-  -  $  X
-  *  -  O

Move 8:
-  -  -  -
-  -  -  O
-  -  $  X
-  -  *  O

Move 9:
-  -  -  -
-  -  -  O
-  -  *  X
-  -  -  O

Found gold in 9 moves.
```

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Experiment No.:	09

AIM: Demonstrate any planning algorithm (FSSP, BSSP, Partial order, Total order) with suitable example.

OUTPUT:

```
Shortest Path: [(0, 1), (0, 2), (0, 3), (1, 3), (2, 3), (3, 3)]
PS D:\DJSCE\Sem 5\Pracs\Codes>
```