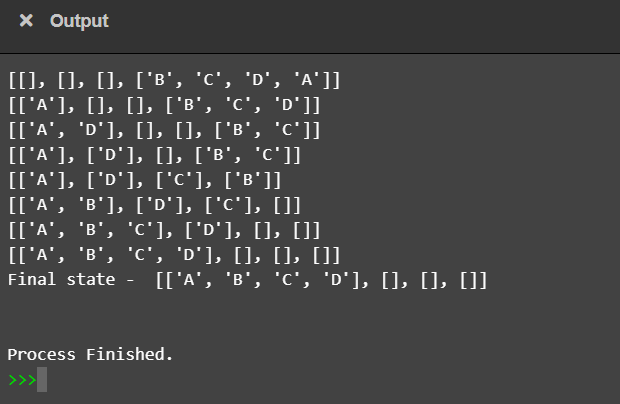
|  |  |
| --- | --- |
| Name: | Prerna Sunil Jadhav |
| Sap  Id: | 60004220127 |
| Class: | T. Y. B.Tech (Computer Engineering) |
| Course: | Artificial Intelligence |
| Course Code: | DJ19CEL503 |
| Experiment  No.: | 04 |

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

OUTPUT:



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| Experiment  No.: | 05 |

**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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| Course Code: | DJ19CEL503 |
| 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. |

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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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| Course Code: | DJ19CEL503 |
| Experiment  No.: | 09 |

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

OUTPUT:

A group of white smileys

Description automatically generated