Intelligent Systems Lab

Lab No- 4

Name- Adhyyan Tripathi

Roll no -8

Sec C

Reg no – 201700403

---

1. **Binary classification:**

Ans –

1) Using default parameter values for the seed dataset –

The default value of parameters are –

n_folds = 5

l_rate = 0.3

n_epoch = 500

n_hidden = 5

and activation function is – Sigmoid Function.

Output –

Scores: [92.85714285714286, 92.85714285714286, 97.61904761904762, 92.85714285714286, 90.47619047619048]

Mean Accuracy: 93.333%

2) Using combination no. 1 of parameters –

The parameter values are –

n_folds = 5

l_rate = 0.0

n_epoch = 500

n_hidden = 5

and activation function is – Sigmoid Function.

Output –

Scores: [38.095238095238095, 23.809523809523807, 35.714285714285715, 30.952380952380953, 23.809523809523807]

Mean Accuracy: 30.476%

3) Using combination no. 2 of parameters –

The parameter values are –

n_folds = 5

l_rate = 1

n_epoch = 500

n_hidden = 5

and activation function is – Sigmoid Function.

Output –

Scores: [92.85714285714286, 92.85714285714286, 97.61904761904762, 92.85714285714286, 88.09523809523809]

Mean Accuracy: 92.857%

4) Using combination no. 3 of parameters –

The parameter values are –

n_folds = 5

l_rate = 0.3

n_epoch = 500

n_hidden = 1

and activation function is – Sigmoid Function.

Output –

Scores: [83.33333333333334, 83.33333333333334, 95.23809523809523, 78.57142857142857, 80.95238095238095]

Mean Accuracy: 84.286%

5) Using combination no. 3 of parameters –

The parameter values are –

n_folds = 5

l_rate = 1

n_epoch = 500

n_hidden = 10

and activation function is – Sigmoid Function.

Output –

Scores: [95.23809523809523, 92.85714285714286, 97.61904761904762, 92.85714285714286, 88.09523809523809]

Mean Accuracy: 93.333%

6) Using default parameters with hyperbolic tangent function –

n_folds = 5

l_rate = 0.3

n_epoch = 500

n_hidden = 5

and activation function is – hyperbolic tangent function

Output –

Scores: [30.952380952380953, 26.190476190476193, 35.714285714285715, 38.095238095238095, 42.857142857142854]

Mean Accuracy: 34.762%

7) Using combination no. 1 of parameters with hyperbolic tangent function –

The parameter values are –

n_folds = 5

l_rate = 0.0

n_epoch = 500

n_hidden = 5

and activation function is – hyperbolic tangent function.

Output –

Scores: [30.952380952380953, 50.0, 33.33333333333333, 30.952380952380953, 42.857142857142854]

Mean Accuracy: 37.619%

8) Using combination no. 2 of parameters with hyperbolic tangent function –

The parameter values are –

n_folds = 5

l_rate = 0.3

n_epoch = 500

n_hidden = 1

and activation function is – hyperbolic tangent function.

Output –

Scores: [38.095238095238095, 23.809523809523807, 33.33333333333333, 38.095238095238095, 33.33333333333333]

Mean Accuracy: 33.333%

Conclusion –

1. When learning rate increases the accuracy does increase but the model does not learn from dataset rather it tries to remember the output of each input.
2. When number of hidden layers or learning rate is increased the accuracy also increases.
3. Sigmoid activation function gives better accuracy than the hyperbolic tangent function.