A picture containing text, furniture

Description automatically generated

COMP8118-A5

University of memphis

S. Parisa Daj. U00743495

Data Mining Assignment

10/3/2022

Chart, scatter chart, bubble chart

Description automatically generated

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ID** | **x1** | **x2** | **y** |  |
| **0** | 1 | 3 | 1 | 1 |
| **1** | 2 | 3 | -1 | 1 |
| **2** | 3 | 6 | 1 | 1 |
| **3** | 4 | 6 | -1 | 1 |
| **4** | 5 | 1 | 0 | -1 |
| **5** | 6 | 0 | 1 | -1 |
| **6** | 7 | 0 | -1 | -1 |
| **7** | 8 | -1 | 0 | -1 |

*From <*[*https://9z83mig9uzk-496ff2e9c6d22116-0-colab.googleusercontent.com/outputframe.html?vrz=colab-20220930-060045-RC01\_478073889*](https://9z83mig9uzk-496ff2e9c6d22116-0-colab.googleusercontent.com/outputframe.html?vrz=colab-20220930-060045-RC01_478073889)*>*

 Q1.

1. Linearly Seperable? Yes
2. Support Vectors: [ 1., 0.], [ 3., 1.], [ 3., -1.]
3. Decision Boundaries:

Chart, scatter chart

Description automatically generated

1. Predict(0, 0) = negative

Predict(3, 3) = Positive

Chart, scatter chart

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Q2.

Table

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1. s0 = y0 = 0

Step 1: Input Forward Propagation

* 1. *Forget gate variable:*

* 1. *Input gate variable:*

* 1. *Input activation variable:*

* 1. *Internal state variable:*

*= 0.6341 \* 0 + 0.6942 \* 0.4699 = 0.3262*

*= 0.6434 \* 0.3262 + 0.7613 \* 0.5005 = 0.5909*

* 1. *Output gate variable: o\_t=σ(W\_o.[x\_t, y\_(t−1)]+b\_o )*

* 1. Final output variable:

0.6364 \* tanh(0.3262) = 0.2005

0.6411 \* tanh(0.5909) = 0.3401

1. Errors

0.2005 - 0.2 = 0.0005

0.3401 - 0.4 = -0.0599