**REPORT- ASSIGNMENT 3**

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Finding the best configuration

|  |  |
| --- | --- |
| **NUMBER OF COMPONENTS** | **ACCURACY** |
| 2 | 62.8571 |
| 3 | 62.8571 |
| 4 | **64.2857** |
| 5 | 62.8571 |

From the above table we can conclude that we found the best results when the number of components was equal to four.

**Sampling from HMM**

Samples generated from model1(Zoom In)

(array([[0.49800027, 0.4096391 , 0.84500328, 0.41083677],

[0.53794318, 0.40256073, 0.86057811, 0.41524358],

[0.53512234, 0.39166979, 0.78146835, 0.41526657],

[0.625771 , 0.4203227 , 0.86515894, 0.41321246],

[0.4863138 , 0.40063686, 0.76683738, 0.40689781],

[0.49232376, 0.42016603, 0.85124564, 0.43208209],

[0.54721696, 0.38957712, 0.76363419, 0.42632351],

[0.56864356, 0.41560055, 0.74654416, 0.43224868],

[0.55796624, 0.36551286, 0.78602901, 0.42561471],

[0.54165685, 0.37800746, 0.73325249, 0.42423557]]), array([1, 1, 1, 1, 1, 1, 1, 1, 1, 1]))

Actual training samples of zoom in

[[0.56063618 0.41351889 0.78528827 0.41550696]

[0.55864811 0.40954274 0.78727634 0.41550696]

[0.55666004 0.41550696 0.78727634 0.4194831 ]

[0.55467197 0.40954274 0.78528827 0.4194831 ]

[0.55467197 0.40755467 0.78528827 0.4194831 ]

[0.55467197 0.40954274 0.78727634 0.42147117]

[0.5526839 0.41153082 0.78528827 0.41749503]

[0.55467197 0.40954274 0.78528827 0.41749503]

[0.55467197 0.40954274 0.78528827 0.4194831 ]

[0.55467197 0.40755467 0.78528827 0.42147117]]

Samples generated from model2(Zoom Out)

(array([[0.40391773, 0.33774721, 0.9027621 , 0.36840648],

[0.42487536, 0.31516411, 0.95763685, 0.33564261],

[0.40733909, 0.30360964, 0.90675121, 0.35367238],

[0.40637721, 0.30963528, 0.88827476, 0.34347625],

[0.38387839, 0.32962443, 0.92712483, 0.31566293],

[0.34438604, 0.31189902, 0.89586007, 0.34265195],

[0.39866971, 0.32481374, 0.91528067, 0.29057985],

[0.40477757, 0.29652869, 0.94810553, 0.26923639],

[0.43053444, 0.33306309, 0.83356966, 0.32527896],

[0.40606287, 0.29938101, 0.86917505, 0.34196862]]), array([0, 0, 0, 0, 0, 0, 0, 0, 0, 0]))

Actual training samples of zoom out

Training data

[[0.40954274 0.29025845 0.94632207 0.3638171 ]

[0.4055666 0.29423459 0.94831014 0.36182903]

[0.40357853 0.29622266 0.95029821 0.35984095]

[0.40159046 0.29821074 0.95029821 0.35984095]

[0.39960239 0.30019881 0.95029821 0.35984095]

[0.39960239 0.30218688 0.95029821 0.35984095]

[0.39761431 0.30417495 0.94831014 0.36182903]

[0.39562624 0.30815109 0.95029821 0.3638171 ]

[0.39562624 0.31013917 0.95029821 0.3638171 ]

[0.38966203 0.31212724 0.95029821 0.3638171 ]]

From the above observations we can assert that the samples generated by our models are very close to the actual training samples.