A0 = ([2.0, -1.75], [2.0, -2.0])

A1 = ([0.25, 1.75], [0.25, -0.25])

A2 = ([0.35, 1.85], [0.35, -0.35])

---Eigen Values for A0----

('Eigen values lies in unit ball', (0.70710678118654746+0j))

('Eigen values lies in unit ball', (-0.70710678118654746+0j))

---Eigen Values for A1----

('Eigen values lies in unit ball', (0.70710678118654746+0j))

('Eigen values lies in unit ball', (-0.70710678118654757+0j))

---Eigen Values for A2----

('Eigen values lies in unit ball', (0.87749643873921224+0j))

('Eigen values lies in unit ball', (-0.87749643873921224+0j))

Exponentially stable states lists are given below-->

['0000', '0011', '0012', '0021', '0110', '0120', '0210', '1001', '1002', '1100', '1111', '1112', '1121', '1200', '1211', '2001', '2100', '2111']

('the state transition matrix is--->', [[-1, 0, 1, 2], [1, 4, -1, -1], [2, 5, -1, -1], [3, 6, -1, -1], [4, 9, -1, -1], [5, 13, -1, -1], [6, 16, -1, -1], [7, -1, 1, 2], [8, -1, 3, -1], [9, -1, 7, 8], [10, -1, 10, 11], [11, -1, 12, -1], [12, -1, 14, -1], [13, -1, 15, -1], [14, -1, 17, -1], [15, -1, 1, 2], [16, -1, 7, 8], [17, -1, 10, 11]])

('cycle found', [1, 4, 9, 7, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0])

('cycle found', [1, 4, 9, 7, 2, 5, 13, 15, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0])

('cycle found', [1, 4, 9, 7, 2, 5, 13, 15, 2, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0])

('cycle found', [1, 4, 9, 8, 3, 6, 16, 7, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0])

('cycle found', [1, 4, 9, 8, 3, 6, 16, 7, 2, 5, 13, 15, 1, 0, 0, 0, 0, 0, 0, 0, 0])

('cycle found', [1, 4, 9, 8, 3, 6, 16, 7, 2, 5, 13, 15, 2, 0, 0, 0, 0, 0, 0, 0, 0])

('cycle found', [1, 4, 9, 8, 3, 6, 16, 8, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0])

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A0 = ([2.0, -1.75], [2.0, -2.0])

A1 = ([1.65, -2.5],[1.66, 1.0])

A2 = ([0.35, 1.85], [0.35, -0.35])

---Eigen Values for A0----

('Eigen values lies in unit ball', (0.70710678118654746+0j))

('Eigen values lies in unit ball', (-0.70710678118654746+0j))

---Eigen Values for A1----

---Eigen Values for A2----

('Eigen values lies in unit ball', (0.87749643873921224+0j))

('Eigen values lies in unit ball', (-0.87749643873921224+0j))

Exponentially stable states lists are given below-->

['0000']

('the state transition matrix is--->', [[-1, 0, 1, 2]])

only one state is stable...Empty automata

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A0 = ([2.0, -1.75], [2.0, -2.0])

A1 = ([2.34, -0.5],[0.52, 1.22])

A2 = ([0.35, 1.85], [0.35, -0.35])

---Eigen Values for A0----

('Eigen values lies in unit ball', (0.70710678118654746+0j))

('Eigen values lies in unit ball', (-0.70710678118654746+0j))

---Eigen Values for A1----

---Eigen Values for A2----

('Eigen values lies in unit ball', (0.87749643873921224+0j))

('Eigen values lies in unit ball', (-0.87749643873921224+0j))

Exponentially stable states lists are given below-->

['0000']

('the state transition matrix is--->', [[-1, 0, 1, 2]])

only one state is stable...Empty automata

---------------------------------------------------------------------------------------------------------------------

A0 = ([2.0, -1.75], [2.0, -2.0])

A1 = ([2.0, 0.25],[0.25, -1.75])

A2 = ([0.45, 1.5], [0.45, -0.45])

---Eigen Values for A0----

('Eigen values lies in unit ball', (0.70710678118654746+0j))

('Eigen values lies in unit ball', (-0.70710678118654746+0j))

---Eigen Values for A1----

('Eigen values lies in unit ball', (-1.7665932438026946+0j))

---Eigen Values for A2----

('Eigen values lies in unit ball', (0.93674969975975975+0j))

('Eigen values lies in unit ball', (-0.93674969975975975+0j))

Exponentially stable states lists are given below-->

['0000']

('the state transition matrix is--->', [[-1, 0, 1, 2]])

only one state is stable...Empty automata

--------------------------------------------------------------------------------------------------------------------

A0 = ([2.0, -1.75], [2.0, -2.0])

A1 = ([0.25, 1.75], [0.25, -0.25])

A2 = ([0.5, -1.85], [0.5, -0.5])

---Eigen Values for A0----

('Eigen values lies in unit ball', (0.70710678118654746+0j))

('Eigen values lies in unit ball', (-0.70710678118654746+0j))

---Eigen Values for A1----

('Eigen values lies in unit ball', (0.70710678118654746+0j))

('Eigen values lies in unit ball', (-0.70710678118654757+0j))

---Eigen Values for A2----

('Eigen values lies in unit ball', 0.82158383625774933j)

('Eigen values lies in unit ball', -0.82158383625774933j)

Exponentially stable states lists are given below-->

['0000', '0011', '0022', '0110', '0220', '1001', '1100', '1111', '1122', '1221', '2002', '2112', '2200', '2211']

('the state transition matrix is--->', [[-1, 0, 1, 2], [1, 3, -1, -1], [2, 4, -1, -1], [3, 6, -1, -1], [4, 12, -1, -1], [5, -1, 1, -1], [6, -1, 5, -1], [7, -1, 7, -1], [8, -1, 9, -1], [9, -1, 13, -1], [10, -1, -1, 2], [11, -1, -1, 8], [12, -1, -1, 10], [13, -1, -1, 11]])

('cycle found', [1, 3, 6, 5, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0])

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