|  |  |  |  |
| --- | --- | --- | --- |
| a0 | b,a0,a4,a6,a8 | 5 | 0001 |
| a1 | a0 | 1 | 1000 |
| a2 | a1, a2 | 2 | 0100 |
| a3 | a2 | 1 | 0011 |
| a4 | a3 | 1 | 0110 |
| a5 | a4,a4,a6,a6 | 4 | 0010 |
| a6 | a5 | 1 | 1100 |
| a7 | a6 | 1 | 1001 |
| a8 | a1,a3,a4,a6,a7,a7,a8 | 7 | 0000 |

|  |  |  |  |
| --- | --- | --- | --- |
| a0 | b,a0,a4,a6,a8 | 5 | 0001 |
| a1 | a0 | 1 | 0011 |
| a2 | a1, a2 | 2 | 1000 |
| a3 | a2 | 1 | 0110 |
| a4 | a3 | 1 | 1100 |
| a5 | a4,a6 | 4 | 0010 |
| a6 | a4,a5,a6 | 3 | 0100 |
| a7 | a6 | 1 | 1001 |
| a8 | a1,a3,a4,a6,a7,a7,a8 | 7 | 0000 |

|  |  |
| --- | --- |
| a0 | 0011 |
| a1 | 0111 |
| a2 | 0101 |
| a3 | 0110 |
| a4 | 0010 |
| a5 | 0100 |
| a6 | 0000 |
| a7 | 1000 |
| a8 | 0001 |

|  |  |
| --- | --- |
| a0 | 0110 |
| a1 | 0010 |
| a2 | 1010 |
| a3 | 0100 |
| a4 | 1000 |
| a5 | 1001 |
| a6 | 0001 |
| a7 | 0101 |
| a8 | 0000 |

23/16 = 1.43 17/14 = 1.21

Выпишем матрицу Т – матрицу всех возможных переходов автомата.

1) Составим матрицу *|T|* пар переходов.

|  |  |  |  |
| --- | --- | --- | --- |
| 0 | 1 | 7 | |
| 1 | 2 | 5 |
| 1 | 8 | 9 |
| 2 | 3 | 5 |
| 3 | 4 | 8 |
| 3 | 8 | 9 |
| 4 | 0 | 9 |
| 4 | 5 | 8 |
| 4 | 6 | 11 |
| 4 | 8 | 11 |
| 5 | 6 | 9 |
| 6 | 0 | 10 |
| 6 | 5 | 9 |
| 6 | 7 | 8 |
| 6 | 8 | 12 |
| 7 | 8 | 8 |
| 8 | 0 | 10 |

|  |  |
| --- | --- |
| ak | n |
| a0 | 4 |
| a1 | 3 |
| a2 | 2 |
| a3 | 3 |
| a4 | 5 |
| a5 | 3 |
| a6 | 6 |
| a7 | 2 |
| a8 | 6 |

|T|=

2) Упорядочим строки матрицы |𝑇|, для чего строим матрицу |𝑀|

|  |  |
| --- | --- |
| 6 | 8 |
| 4 | 6 |
| 4 | 8 |
| 6 | 0 |
| 8 | 0 |
| 1 | 8 |
| 3 | 8 |
| 4 | 0 |
| 5 | 6 |
| 6 | 5 |
| 3 | 4 |
| 4 | 5 |
| 6 | 7 |
| 7 | 8 |
| 0 | 1 |
| 1 | 2 |
| 2 | 3 |

*|M|=*

3) Закодируем первые 2 состояния:

**𝑎6=0000; 𝑎8=0001;**

4)

B4 = {6,8} = {0000, 0001}

C46 = {0010, 0100, 1000} C48 = {0011, 0101, 1001}

D14 = {0010, 0100, 1000, 0011, 0101, 1001}

W0010 = |0010 – 0000|2 + |0010 – 0001|2 = 1 + 2 = 3

W0100 = |0100 – 0000|2 + |0100 – 0001|2 = 1 + 2 = 3

W1000 = |1000 – 0000|2 + |1000 – 0001|2 = 1 + 2 = 3

W0011 = |0011 – 0000|2 + |0011 – 0001|2 = 2 + 1 = 3

W0101 = |0101 – 0000|2 + |0101 – 0001|2 = 2 + 1 = 3

W1001 = |1001 – 0000|2 + |1001 – 0001|2 = 2 + 1 = 3

**𝑎4=0010;**

B0 = {4,6,8} = {0010, 0000, 0001}

C06 = {0100, 1000} C08 = {0011, 0101, 1001} C04 = {0011, 0110, 1010}

D10 = {0100, 1000, 0011, 0101, 1001, 0110, 1010}

W0100 = |0100 – 0010|2 + |0100 – 0000|2 + |0100 – 0001|2 = 2 + 1 + 2 = 5

W1000 = |1000 – 0010|2 + |1000 – 0000|2 + |1000 – 0001|2 = 2 + 1 + 2 = 5

W0011 = |0011 – 0010|2 + |0011 – 0000|2 + |0011 – 0001|2 = 1 + 2 + 1 = 4

W0101 = |0101 – 0010|2 + |0101 – 0000|2 + |0101 – 0001|2 = 3 + 2 + 1 = 6

W1001 = |1001 – 0010|2 + |1001 – 0000|2 + |1001 – 0001|2 = 3 + 2 + 1 = 6

W0110 = |0110 – 0010|2 + |0110 – 0000|2 + |0110 – 0001|2 = 1 + 2 + 3 = 6

W1010 = |1010 – 0010|2 + |1010 – 0000|2 + |1010 – 0001|2 = 1 + 2 + 3 = 6

**𝑎0=0011;**

B1 = {0, 8} = {0011, 0001}

C10 = {0111, 1011} C18 = {0101, 1001}

D10 = {0111, 1011, 0101, 1001}

W0111 = |0111 – 0011|2 + |0111 – 0001|2= 1 + 2 = 3

W1011 = |1011 – 0011|2 + |1011 – 0001|2 = 1 + 2 = 3

W0101 = |0101 – 0011|2 + |0101 – 0001|2 = 2 + 1 = 3

W1001 = |1001 – 0011|2 + |1001 – 0001|2 = 2 + 1 = 3

**𝑎1=0111;**

B3 = {4, 8} = {0010, 0001}

C34 = {0110, 1010} C38 = {0101, 1001}

D13 = {0110, 1010, 0101, 1001}

W0110 = |0110 – 0010|2 + |0111 – 0001|2= 1 + 2 = 3

W1010 = |1010 – 0010|2 + |1011 – 0001|2 = 1 + 2 = 3

W0101 = |0101 – 0010|2 + |0101 – 0001|2 = 3 + 1 = 4

W1001 = |1001 – 0010|2 + |1001 – 0001|2 = 3 + 1 = 4

**𝑎3=0110;**

B5 = {4, 6} = {0010, 0000}

C54 = {1010} C50 = {0100, 1000}

D15 = {1010, 0100, 1000}

W1010 = |1010 – 0010|2 + |1010 – 0000|2+ |000 – 1010|2= 1 + 2 + 2 = 5

W0100 = |0100 – 0010|2 + |0100 – 0000|2 + |0000 – 0100|2 = 2 + 1 + 1 = 4

W1000 = |1000 – 0010|2 + |1000 – 0000|2 + |0000 – 1000|2 = 2 + 1 + 1 = 4

**𝑎5=0100;**

B7 = {6, 8} = {0000, 0001}

C76 = {1000} C78 = {0101, 1001}

D17 = {1000, 0101, 1001}

W1000 = |1000 – 0000|2 + |1000 – 0001|2= 1 + 2 = 3

W0101 = |0101 – 0000|2 + |0101 – 0001|2 = 2 + 1 = 3

W1001 = |1001 – 0000|2 + |1001 – 0001|2 = 2 + 1 = 3

**𝑎7=1000;**

B2 = {1, 3} = {0111, 0110}

C21 = {0101, 1111} C23 = {1110}

D17 = {0101, 1111, 1110}

W0101 = |0101 – 0111|2 + |0101 – 0110|2= 1 + 2 = 3

W1111 = |1111 – 0111|2 + |1111 – 0110|2 = 1 + 2 = 3

W1110 = |1110 – 0111|2 + |1110 – 0110|2 = 2 + 1 = 3

**𝑎2=0101;**

Выпишем матрицу Т – матрицу всех возможных переходов автомата.

1) Составим матрицу *|T|* пар переходов.

|  |  |  |  |
| --- | --- | --- | --- |
| 0 | 1 | 5 | |
| 1 | 2 | 5 |
| 1 | 8 | 9 |
| 2 | 3 | 5 |
| 3 | 4 | 7 |
| 3 | 8 | 9 |
| 4 | 5 | 7 |
| 4 | 6 | 9 |
| 4 | 8 | 10 |
| 5 | 6 | 8 |
| 6 | 5 | 8 |
| 6 | 7 | 7 |
| 6 | 8 | 11 |
| 7 | 8 | 8 |
| 8 | 0 | 8 |

|  |  |
| --- | --- |
| ak | n |
| a0 | 2 |
| a1 | 3 |
| a2 | 2 |
| a3 | 3 |
| a4 | 4 |
| a5 | 3 |
| a6 | 5 |
| a7 | 2 |
| a8 | 6 |

|T|=

2) Упорядочим строки матрицы |𝑇|, для чего строим матрицу |𝑀|

|  |  |
| --- | --- |
| 6 | 8 |
| 4 | 8 |
| 1 | 8 |
| 3 | 8 |
| 4 | 6 |
| 5 | 6 |
| 6 | 5 |
| 7 | 8 |
| 8 | 0 |
| 3 | 4 |
| 4 | 5 |
| 6 | 7 |
| 0 | 1 |
| 1 | 2 |
| 2 | 3 |

*|M|=*

3) Закодируем первые 2 состояния:

**𝑎6=0000; 𝑎8=0001;**

4)

B4 = {6,8} = {0000, 0001}

C46 = {0010, 0100, 1000} C48 = {0011, 0101, 1001}

D14 = {0010, 0100, 1000, 0011, 0101, 1001}

W0010 = |0010 – 0000|2 + |0010 – 0001|2 = 1 + 2 = 3

W0100 = |0100 – 0000|2 + |0100 – 0001|2 = 1 + 2 = 3

W1000 = |1000 – 0000|2 + |1000 – 0001|2 = 1 + 2 = 3

W0011 = |0011 – 0000|2 + |0011 – 0001|2 = 2 + 1 = 3

W0101 = |0101 – 0000|2 + |0101 – 0001|2 = 2 + 1 = 3

W1001 = |1001 – 0000|2 + |1001 – 0001|2 = 2 + 1 = 3

**𝑎4=0010;**

B1 = {8} = {0001}

C18 = {0011, 0101, 1001}

D11 = {0011, 0101, 1001}

W0011 = |0011 – 0001|2 = 1

W0101 = |0101 – 0001|2 = 1

W1001 = |1001 – 0001|2 = 1

**𝑎1=0011;**

B3 = {4, 8} = {0010, 0001}

C34 = {0110, 1010} C38 = {0101, 1001}

D13 = {0110, 1010, 0101, 1001}

W0110 = |0110 – 0010|2 + |0110 – 0001|2 = 1 + 3 = 4

W1010 = |1010 – 0010|2 + |1010 – 0001|2 = 1 + 3 = 4

W0101 = |0101 – 0010|2 + |0101 – 0001|2 = 3 + 1 = 4

W1001 = |1001 – 0010|2 + |1001 – 0001|2 = 3 + 1 = 4

**𝑎3=0110;**

B5 = {4, 6} = {0010, 0000}

C54 = {1010} C56 = {0100, 1000}

D15 = {1010, 0100, 1000}

W1010 = |1010 – 0010|2 + |1010 – 0000|2+ |0000 – 1010|2= 1 + 2 + 2 = 5

W0100 = |0100 – 0010|2 + |0100 – 0000|2 + |0000 – 0100|2 = 2 + 1 + 1 = 4

W1000 = |1000 – 0010|2 + |1000 – 0000|2 + |0000 – 1000|2 = 2 + 1 + 1 = 4

**𝑎5=0100;**

B7 = {6, 8} = {0000, 0001}

C76 = {1000} C78 = {0101, 1001}

W1000 = |1000 – 0000|2 + |1000 – 0001|2 = 1 + 2 = 3

W0101 = |0101 – 0000|2 + |0101 – 0001|2 = 2 + 1 = 3

W1001 = |1001 – 0000|2 + |1001 – 0001|2 = 2 + 1 = 3

**𝑎7=1000;**

B0 = {1, 8} = {0011, 0001}

C01 = {0111, 1011} C08 = {0101, 1001}

D10 = {0111, 1011, 0101, 1001}

W0111 = |0111 – 0011|2 + |0111 – 0001|2 = 1 + 2 = 3

W1011 = |1011 – 0011|2 + |1011 – 0001|2 = 1 + 2 = 3

W0101 = |0101 – 0011|2 + |0101 – 0001|2 = 2 + 1 = 3

W1001 = |1001 – 0011|2 + |1001 – 0001|2 = 2 + 1 = 3

**𝑎0=1001;**

B2 = {1, 3} = {0011, 0110}

C21 = {0111, 1011} C23 = {0111, 1110}

D12 = {0111, 1011, 1110}

W0111 = |0111 – 0011|2 + |0111 – 0110|2 = 1 + 1 = 2

W1011 = |1011 – 0011|2 + |1011 – 0110|2 = 1 + 3 = 4

W1110 = |1110 – 0011|2 + |1110 – 0110|2 = 3 + 1 = 4

**𝑎2=0111;**

|  |  |
| --- | --- |
| a0 | 1001 |
| a1 | 0011 |
| a2 | 0111 |
| a3 | 0110 |
| a4 | 0010 |
| a5 | 0100 |
| a6 | 0000 |
| a7 | 1000 |
| a8 | 0001 |

20/15 = 1.33

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| а0 | а1 | а2 | а3 | а4 | а5 | а6 | а7 | а8 |
| 1001 | 0011 | 0111 | 0101 | 0100 | 0010 | 0000 | 1000 | 0001 |