Sequence:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 2 | 3 | 5 | 7 | 8 | 6 | 14 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| № | Current state | | | | № | Next state | | | |
|  | Q1 | Q2 | Q3 | Q4 |  | D1 | D2 | D3 | D4 |
| 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 |
| 2 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 1 | 1 |
| 3 | 0 | 0 | 1 | 1 | 5 | 0 | 1 | 0 | 1 |
| 5 | 0 | 1 | 0 | 1 | 7 | 0 | 1 | 1 | 1 |
| 7 | 0 | 1 | 1 | 1 | 8 | 1 | 0 | 0 | 0 |
| 8 | 1 | 0 | 0 | 0 | 6 | 0 | 1 | 1 | 0 |
| 6 | 0 | 1 | 1 | 0 | 14 | 1 | 1 | 1 | 0 |
| 14 | 1 | 1 | 1 | 0 | х | х | х | х | х |

Use Karnaugh map to shorten logic function:

D1:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q3Q4  Q1Q2 | 00 | 01 | 11 | 10 |
| 00 |  |  |  |  |
| 01 |  |  | 1 | 1 |
| 11 |  |  |  |  |
| 10 |  |  |  |  |

Check by means Boolean algebra:

D2:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q3Q4  Q1Q2 | 00 | 01 | 11 | 10 |
| 00 |  |  | 1 |  |
| 01 |  | 1 |  | 1 |
| 11 |  |  |  |  |
| 10 | 1 |  |  |  |

Does not shortable.

D3:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q3Q4  Q1Q2 | 00 | 01 | 11 | 10 |
| 00 | 1 |  |  | 1 |
| 01 |  | 1 |  | 1 |
| 11 |  |  |  |  |
| 10 | 1 |  |  |  |

Check by means Boolean algebra:

D4:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q3Q4  Q1Q2 | 00 | 01 | 11 | 10 |
| 00 |  |  | 1 | 1 |
| 01 |  | 1 |  |  |
| 11 |  |  |  |  |
| 10 |  |  |  |  |

Check by means Boolean algebra: