|  |  |
| --- | --- |
| **Digital circuits laboratory class** | **Year 2024, exercise 5** |
| Author: Jakub Turkowski | Title of the exercise: Synthesis of synchronous circuit |
| Laboratory group number: 2 | Week day: Tuesday  Realization date: 16.04.2024  Hours of the lab: 15:15-16:55 |

Moore machine

Obraz zawierający krąg, diagram, rysowanie, szkic

Opis wygenerowany automatycznie

where:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Q1 | Q2 | Q3 | Q4 |
| Y1 Y2 | 0 0 | 0 1 | 1 1 | 1 0 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| X | Y1 | Y2 | Y1 NEXT | Y2 NEXT | D1 | D2 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 | 0 | 1 | 0 |
| 1 | 0 | 1 | 1 | 0 | 1 | 0 |
| 1 | 1 | 0 | 0 | 1 | 0 | 1 |

And from the table:

D1 = X’Y2+XY2=Y2

D2 = X’Y2+XY2’

And for the outputs (as one will be odd and two even):

Z1=Y2Y1’

Z2=Y2’Y1

Mealy’s machine

Obraz zawierający szkic, Czcionka, krąg, diagram

Opis wygenerowany automatycznie

where:

|  |  |  |
| --- | --- | --- |
|  | Q1 | Q2 |
| Y | 0 | 1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| X | Y | Y NEXT | J | K |
| 0 | 0 | 0 | 0 | - |
| 1 | 0 | 1 | 1 | - |
| 0 | 1 | 1 | - | 0 |
| 1 | 1 | 0 | - | 1 |

And from the table:

J=X

K=X

As this implementation only uses one JK flip flop, we only take into account the J and K (X) and the outputs – the negated one for even ones and regular for odd ones.

Obraz zawierający tekst, zrzut ekranu, wyświetlacz, diagram

Opis wygenerowany automatycznie