FAKULTA
APLIKOVANÝCH VĚD
ZÁPADOČESKÉ
UNIVERZITY
V PLZNI

Semestrální práce z KIV/UPA

Návrh automatu

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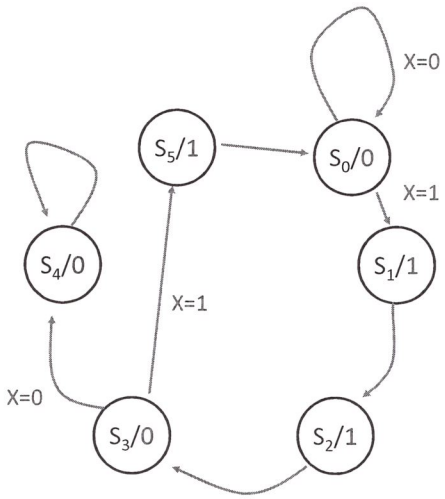
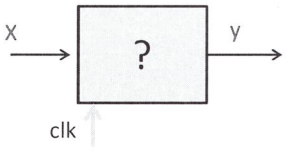
Zadání automatu





Použijte klopné obvody typu JK a proveďte simulaci pomocí programu Logisim.

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0.1 Tabulky

Tabulka 1: Zápis grafu tabulkou

S_n	$x = 0$	$x = 1$	Výstup
S_0	S_0	S_1	0
S_1	S_2	S_2	1
S_2	S_3	S_3	1
S_3	S_4	S_5	0
S_4	S_4	S_4	0
S_5	S_0	S_0	1

Tabulka 2: Kódování stavů

S_n	s_1	s_2	s_3
S_0	0	0	0
S_1	0	0	1
S_2	0	1	0
S_3	0	1	1
S_4	1	0	0
S_5	1	0	1

Tabulka 3: Zápis grafu tabulkou se zakódovanými stavy

Stav ($s_1s_2s_3$)	$x = 0$	$x = 1$	Výstup
000	000	001	0
001	010	010	1
010	011	011	1
011	100	101	0
100	100	100	0
101	000	000	1

Tabulka 4: Budící funkce obvodu JK

Q_s	Q_n	J	K
0	0	0	x
0	1	1	x
1	0	x	1
1	1	x	0

Tabulka 5: Návrh s JK-klopnými obvody

In				Out				JK					
s_1	s_2	s_3	X	s_1	s_2	s_3	Y	J_1	K_1	J_2	K_2	J_3	K_3
0	0	0	0	0	0	0	0	0	x	0	x	0	x
0	0	0	1	0	0	1	0	0	x	0	x	1	x
0	0	1	0	0	1	0	1	0	x	1	x	x	1
0	0	1	1	0	1	0	1	0	x	1	x	x	1
0	1	0	0	0	1	1	1	0	x	x	0	1	x
0	1	0	1	0	1	1	1	0	x	x	0	1	x
0	1	1	0	1	0	0	0	1	x	x	1	x	1
0	1	1	1	1	0	1	0	1	x	x	1	x	0
1	0	0	0	1	0	0	0	x	0	0	x	0	x
1	0	0	1	1	0	0	0	x	0	0	x	0	x
1	0	1	0	0	0	0	1	x	1	0	x	x	1
1	0	1	1	0	0	0	1	x	1	0	x	x	1

Tabulka 6: Karnaughova mapa pro Y

s_3 \ $s_1 s_2$	00	01	11	10
0	0	1	x	0
1	1	0	x	1

Tabulka 7: Karnaughova mapa pro J_1

s_3 \ $s_1 s_2$	00	01	11	10
0	0	0	x	x
1	0	1	x	x

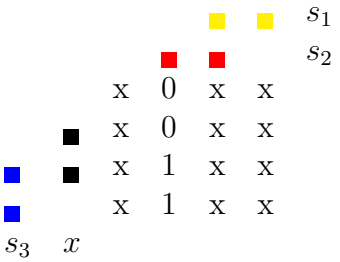
Tabulka 8: Karnaughova mapa pro K_1

s_3 \ $s_1 s_2$	00	01	11	10
0	x	x	x	0
1	x	x	x	1

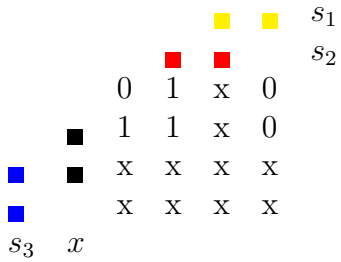
Tabulka 9: Karnaughova mapa pro J_2

s_3 \ $s_1 s_2$	00	01	11	10
0	0	x	x	0
1	1	x	x	0

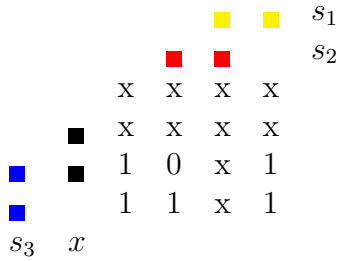
Tabulka 10: Karnaughova mapa pro K_2



Tabulka 11: Karnaughova mapa pro J_3

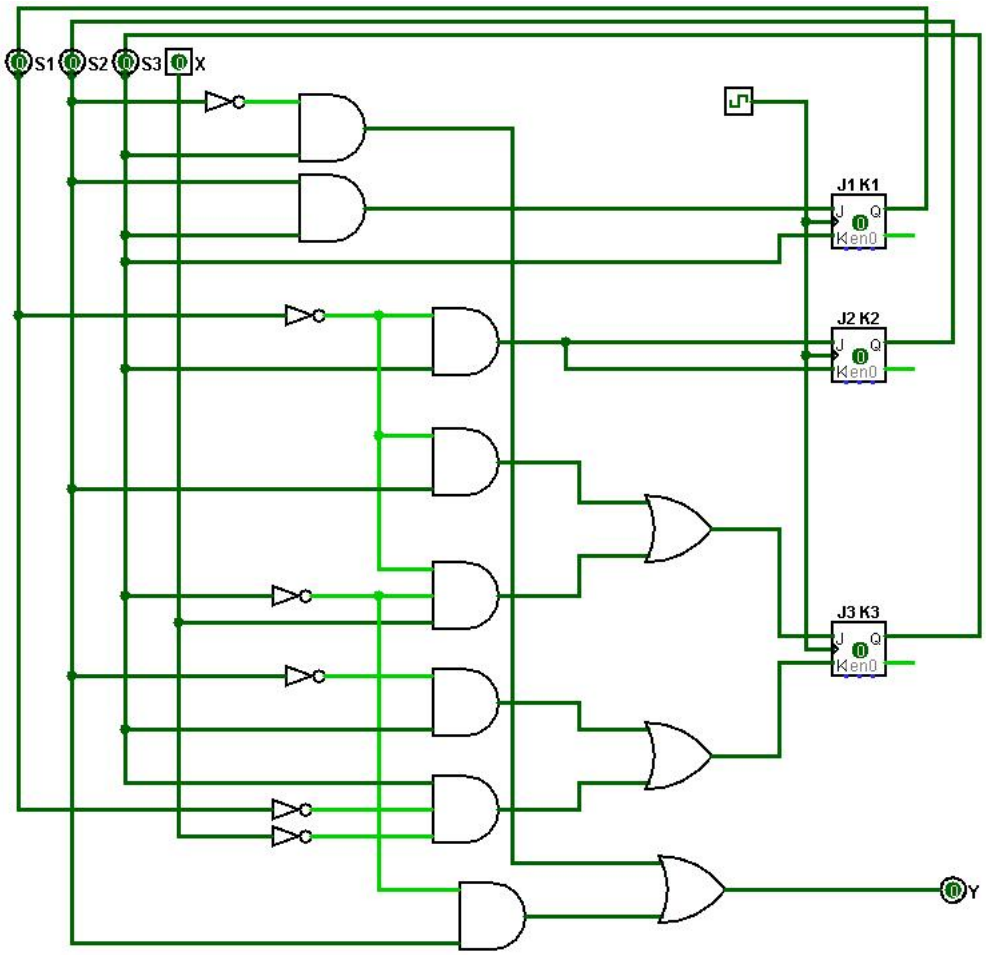


Tabulka 12: Karnaughova mapa pro K_3



Výrazy po zjednodušení':

- $y = (\neg s_1 \vee s_2) \wedge (\neg s_3 \vee s_2)$
- $J_1 = s_2 \vee s_3$
- $K_1 = s_3$
- $J_2 = \neg s_1 \vee s_3$
- $K_2 = J_2$
- $J_3 = (\neg s_1 \vee s_2) \wedge (\neg s_1 \vee \neg s_3 \vee x)$
- $K_3 = (\neg s_2 \vee s_3) \wedge (s_3 \vee \neg s_1 \vee \neg x)$



Obrázek 1: Návrh logického automatu