

TECY - Projekt 3

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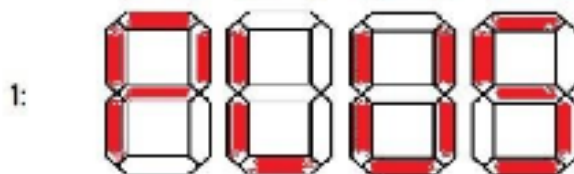
2 kwietnia 2021

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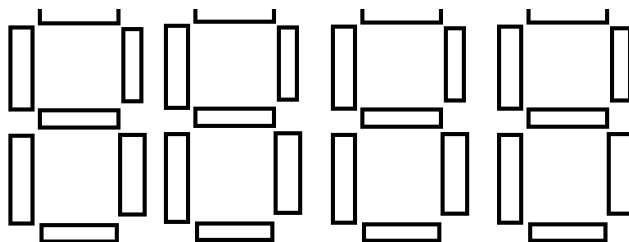
1 Wskaźnik

Nasz wskaźnik do danych to: $3 + 8 + 8 + 2 = 21$

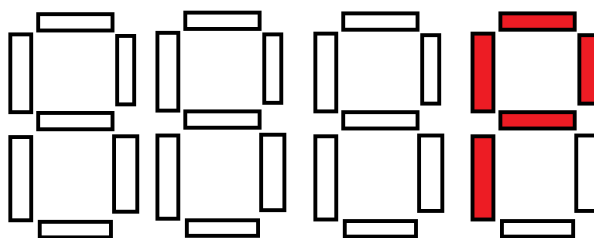


Rysunek 1: Nasz wzór do realizacji

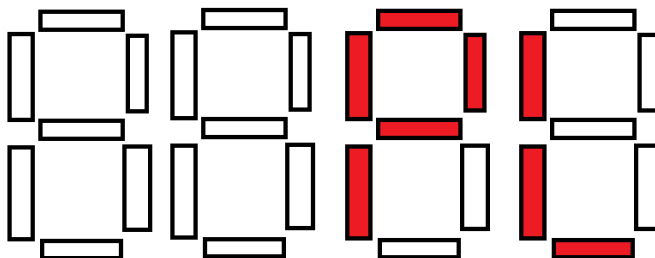
2 Stany



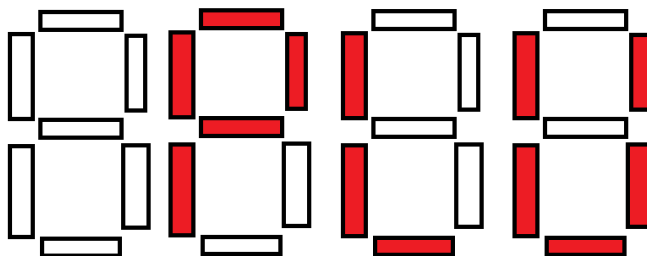
Rysunek 2: Widok stanu 0.



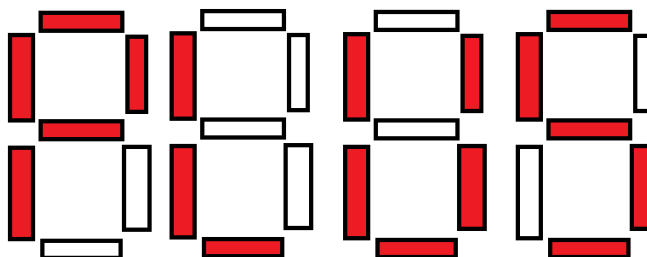
Rysunek 3: Widok stanu 1.



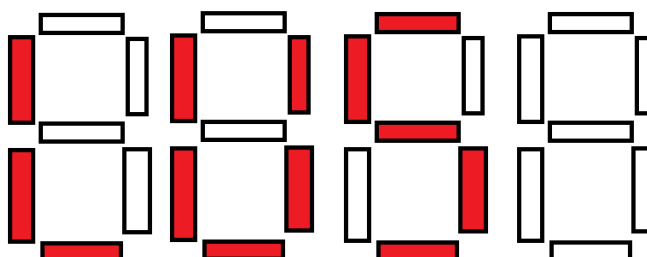
Rysunek 4: Widok stanu 2.



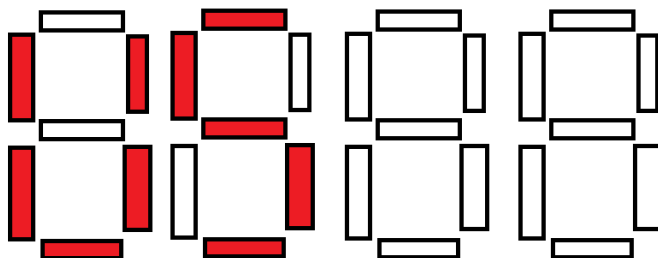
Rysunek 5: Widok stanu 3.



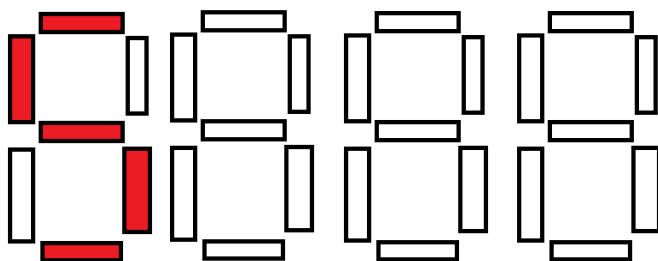
Rysunek 6: Widok stanu 4.



Rysunek 7: Widok stanu 5.



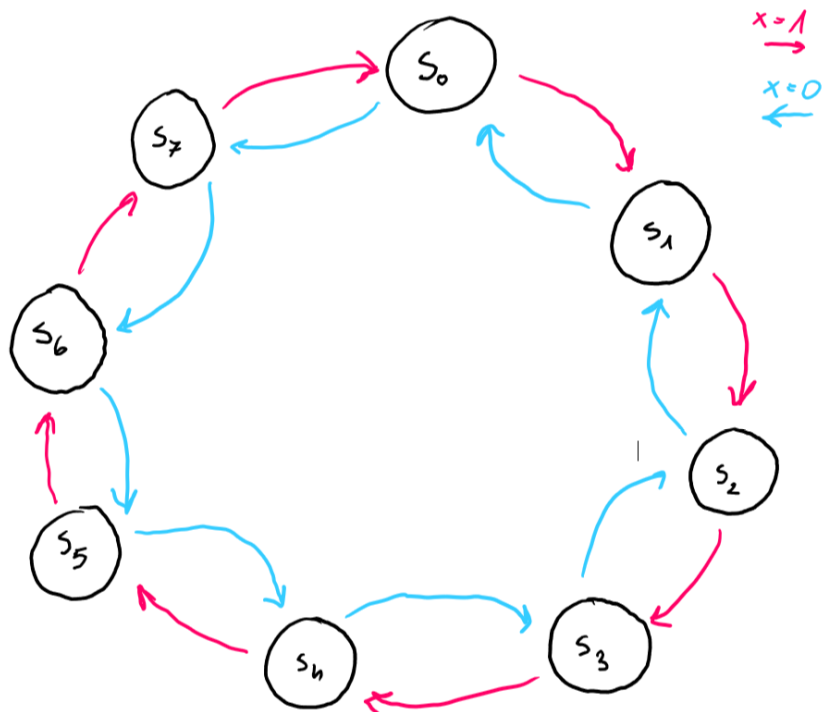
Rysunek 8: Widok stanu 6.



Rysunek 9: Widok stanu 7.

3 Funkcja stanu następnego

Na początku narysujemy schemat działania funkcji. Zmienna x decyduje o kierunku animacji liter (dla $x=1$ od lewej do prawej, a dla $x=0$ od prawej do lewej).



Rysunek 10: Schemat funkcji ("S" z indeksem oznaczają kolejne stany.)

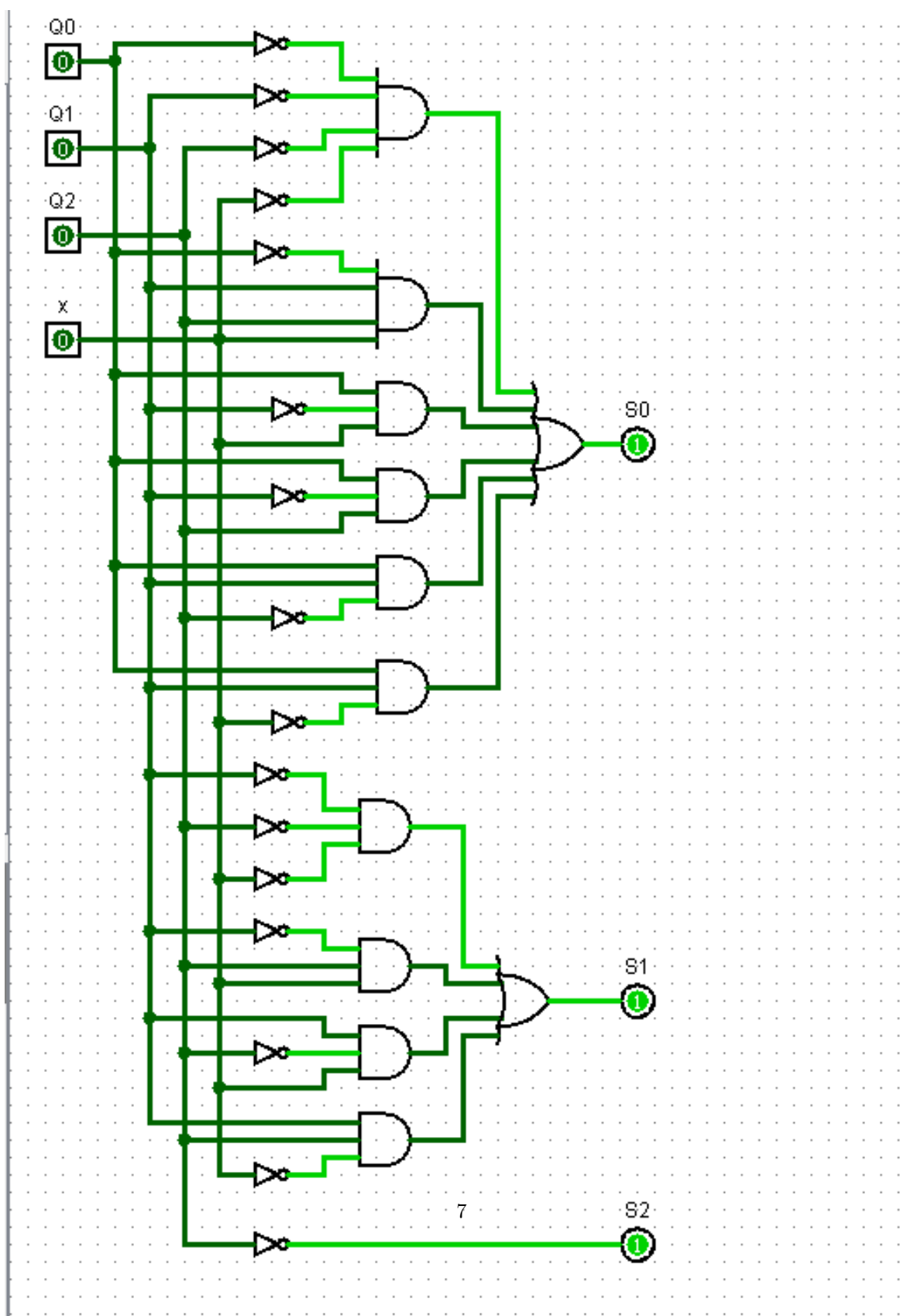
Realizujemy funkcję w Logisimie:

Q0	Q1	Q2	x	S0	S1	S2
0	0	0	0	1	1	1
0	0	0	1	0	0	1
0	0	1	0	0	0	0
0	0	1	1	0	1	0
0	1	0	0	0	0	1
0	1	0	1	0	1	1
0	1	1	0	0	1	0
0	1	1	1	1	0	0
1	0	0	0	0	1	1
1	0	0	1	1	0	1
1	0	1	0	1	0	0
1	0	1	1	1	1	0
1	1	0	0	1	0	1
1	1	0	1	1	1	1
1	1	1	0	1	1	0
1	1	1	1	0	0	0

Build Circuit

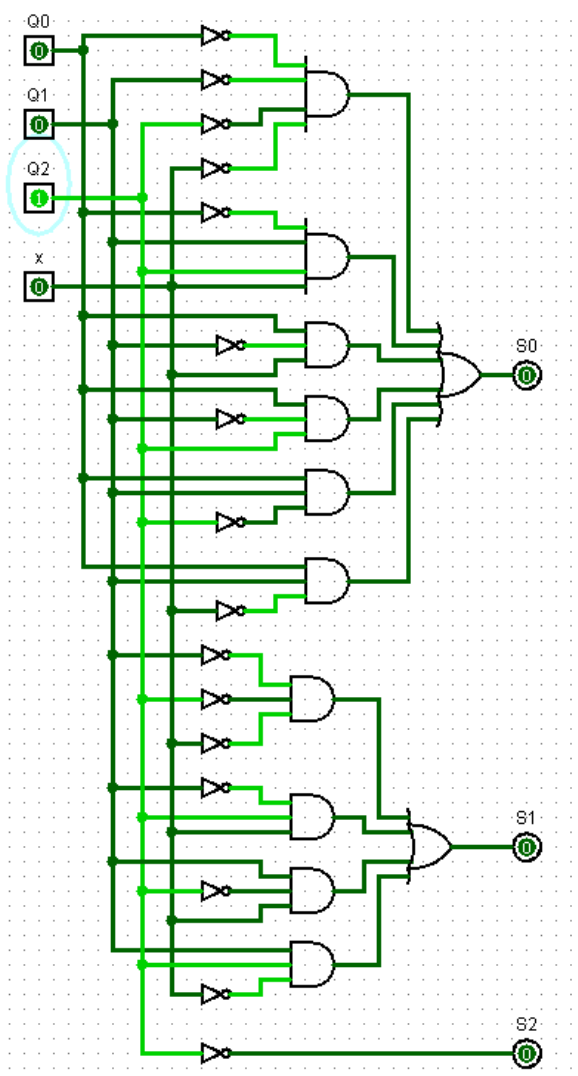
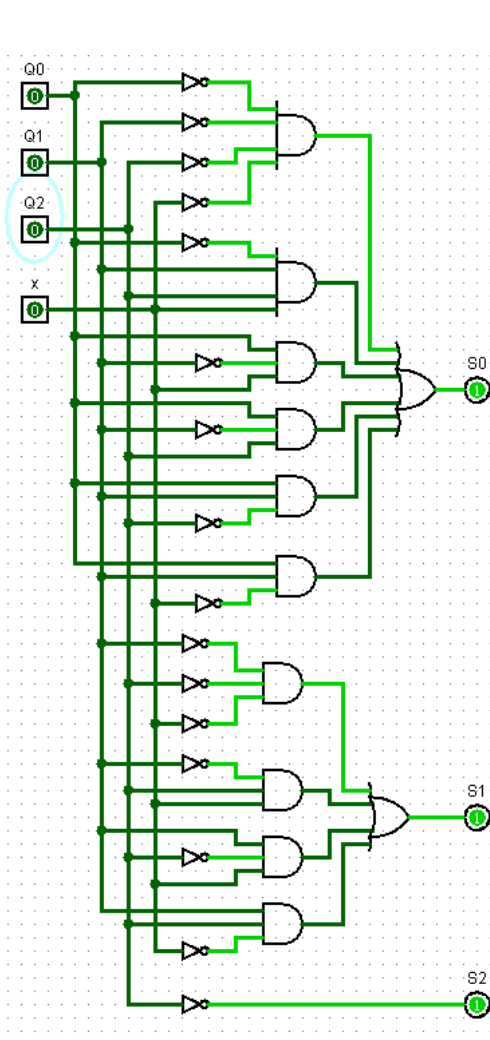
Rysunek 11: Tablica prawdy funkcji.

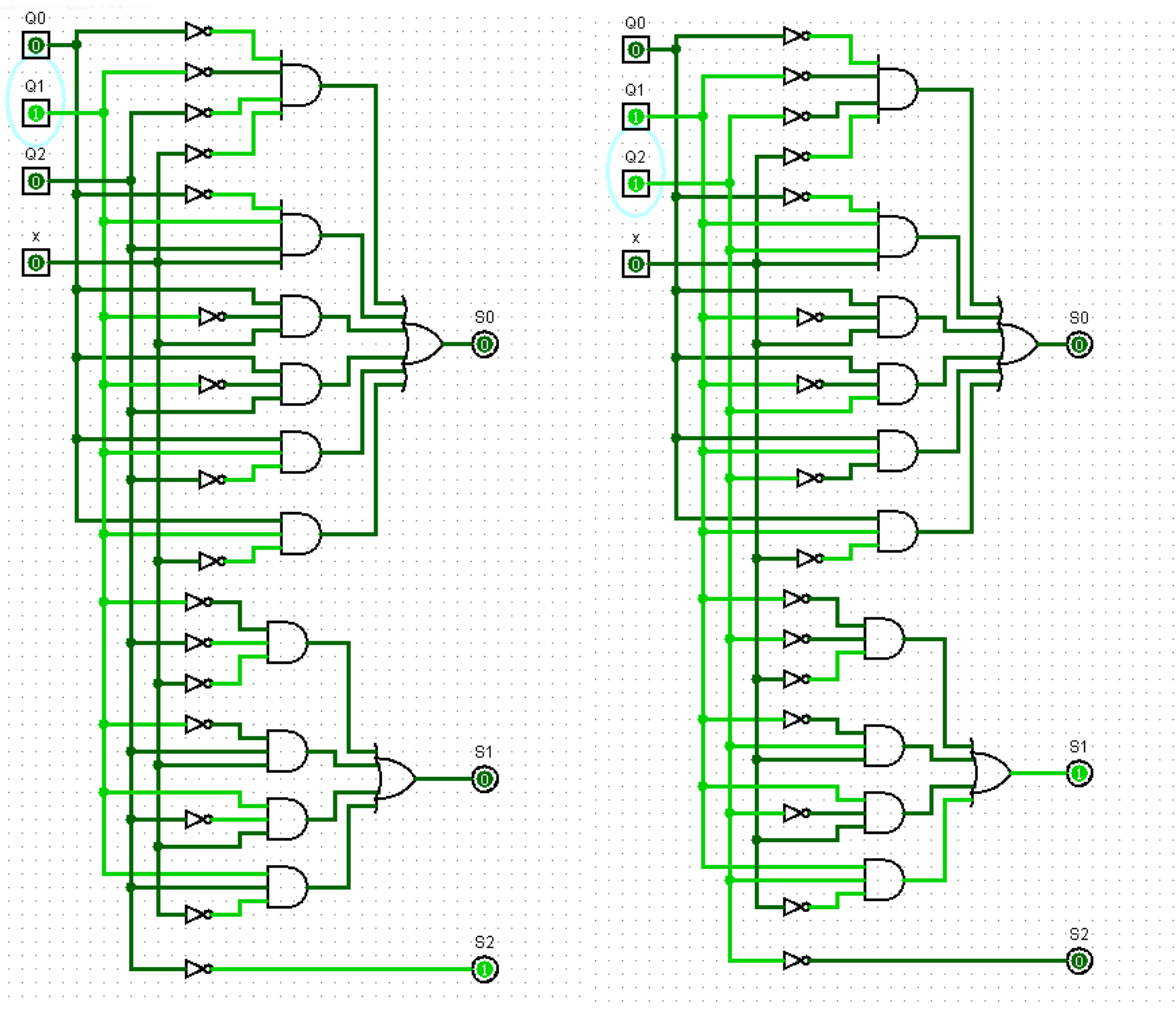
Wejście: Q_0, Q_1, Q_2 to numer aktualnego stanu zapisany binarnie; x decyduje o kierunku animacji.
 Wyjście: S_0, S_1, S_2 to numer kolejnego stanu zapisany binarnie.

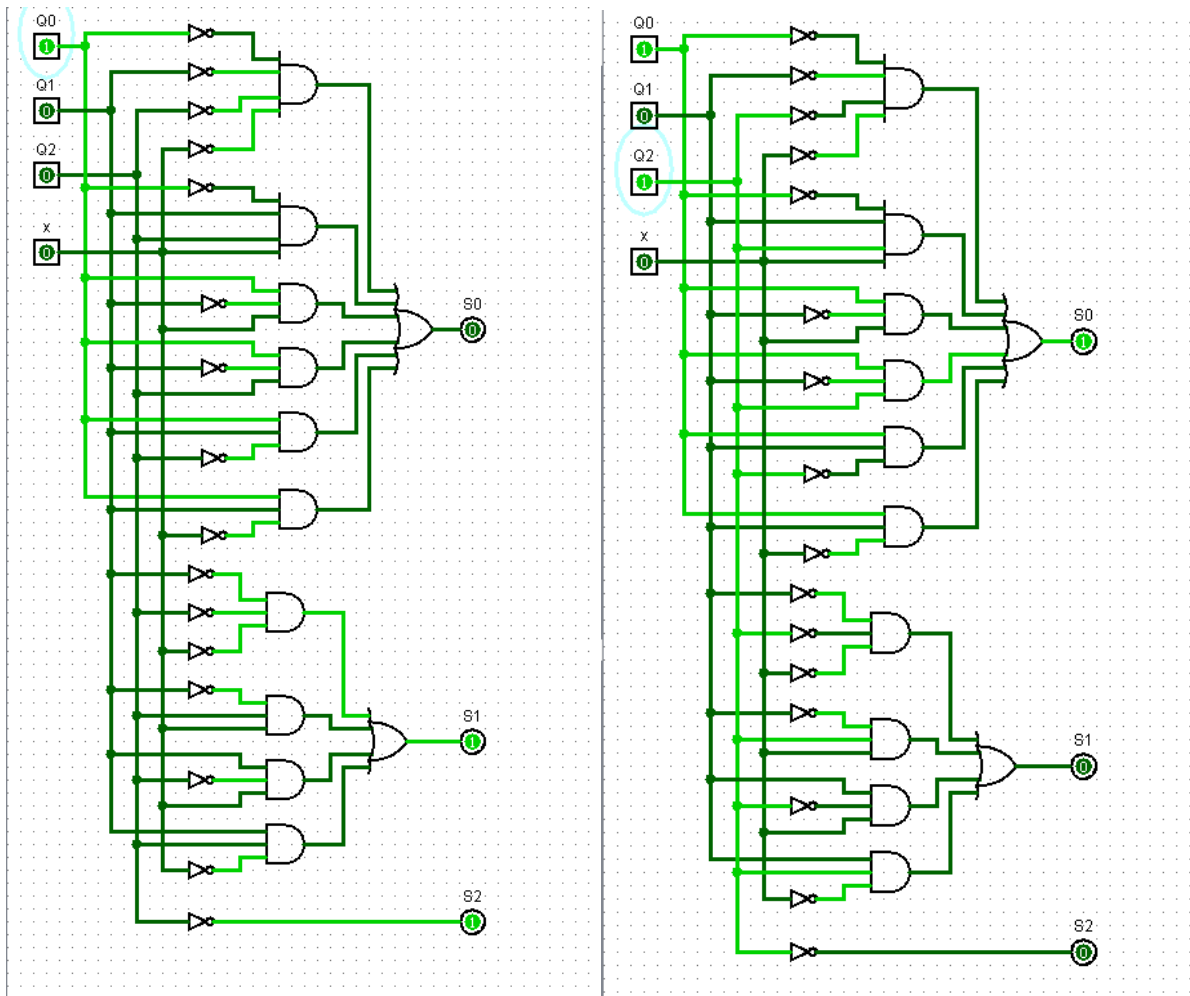


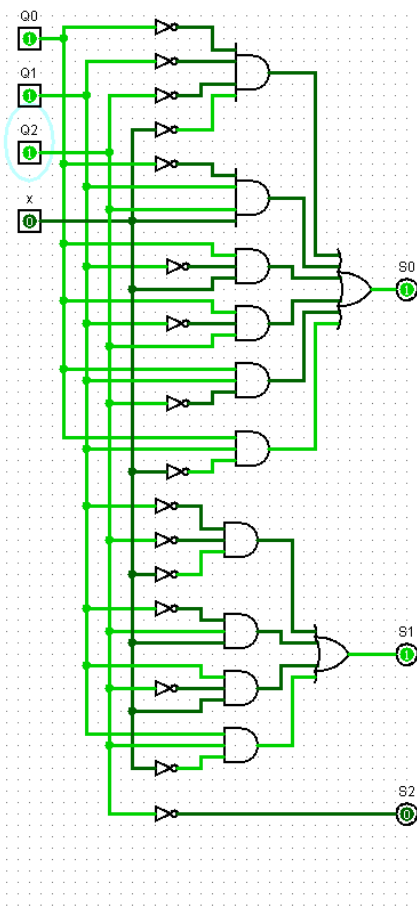
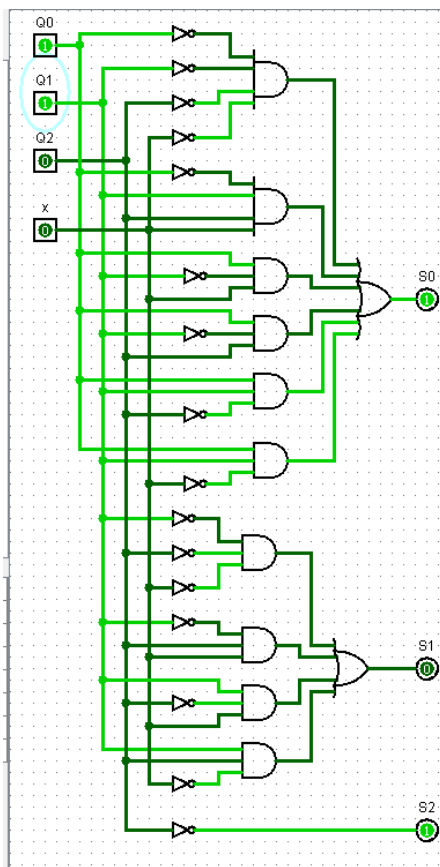
Rysunek 12: Widok funkcji w Logisimie.

Testy funkcji dla $x=0$:

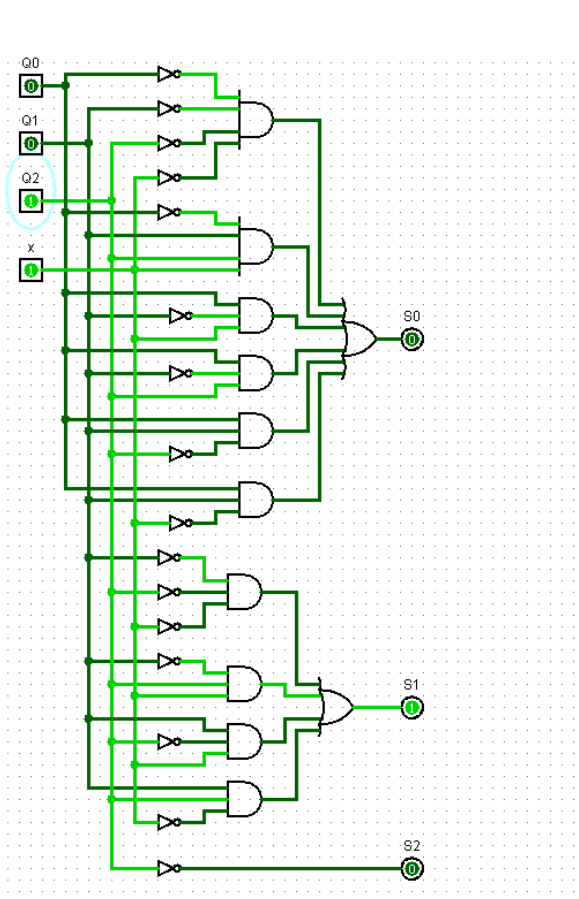
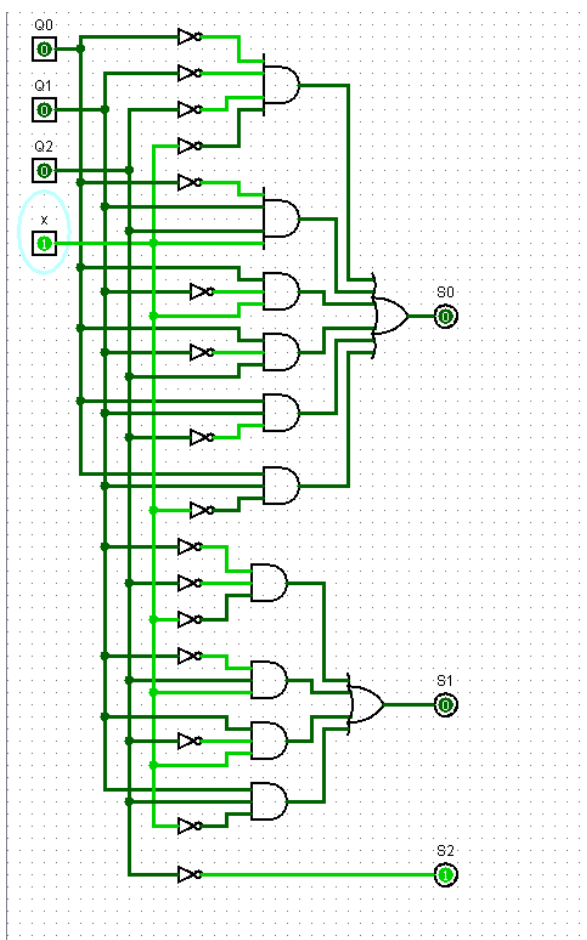


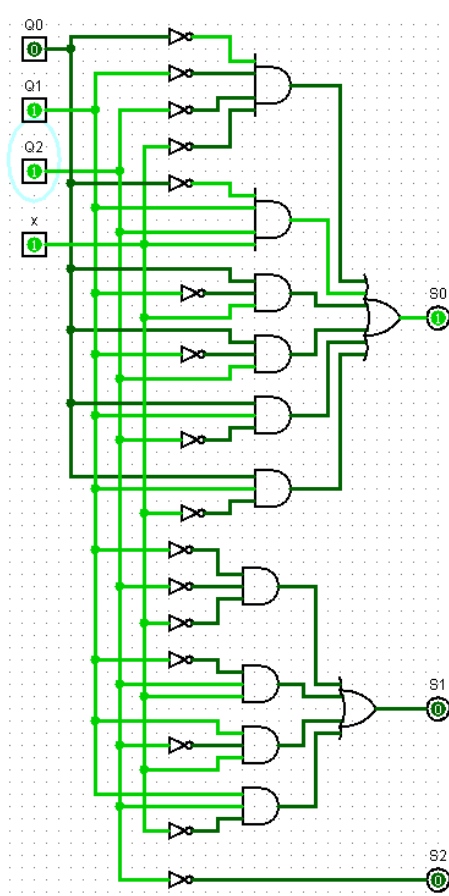
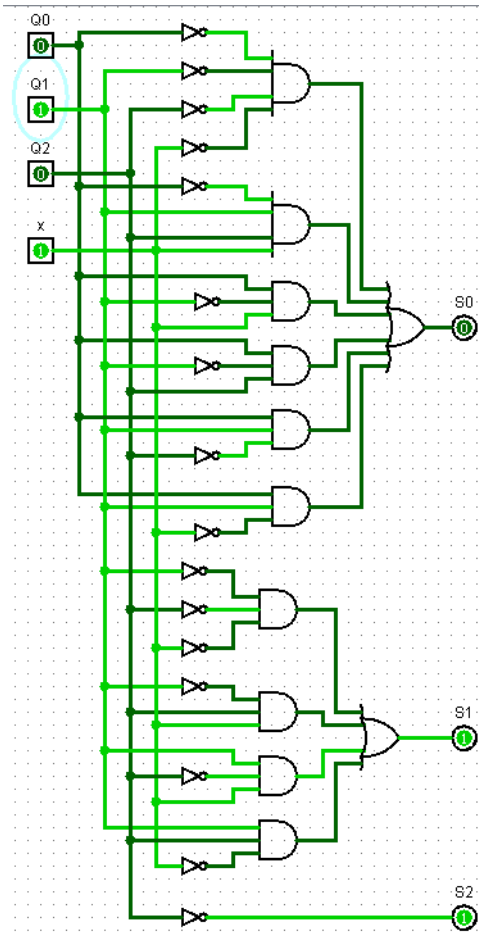


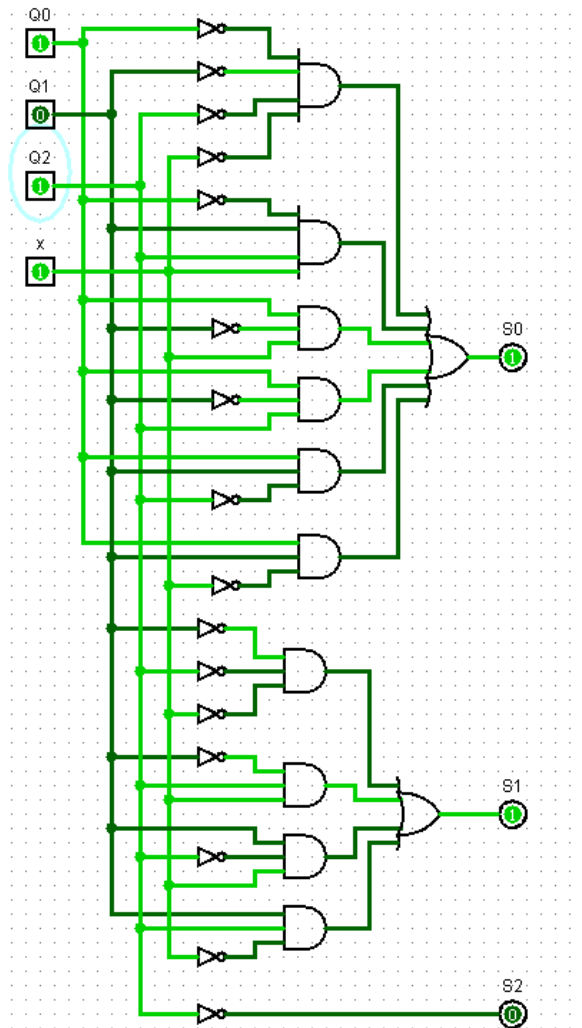
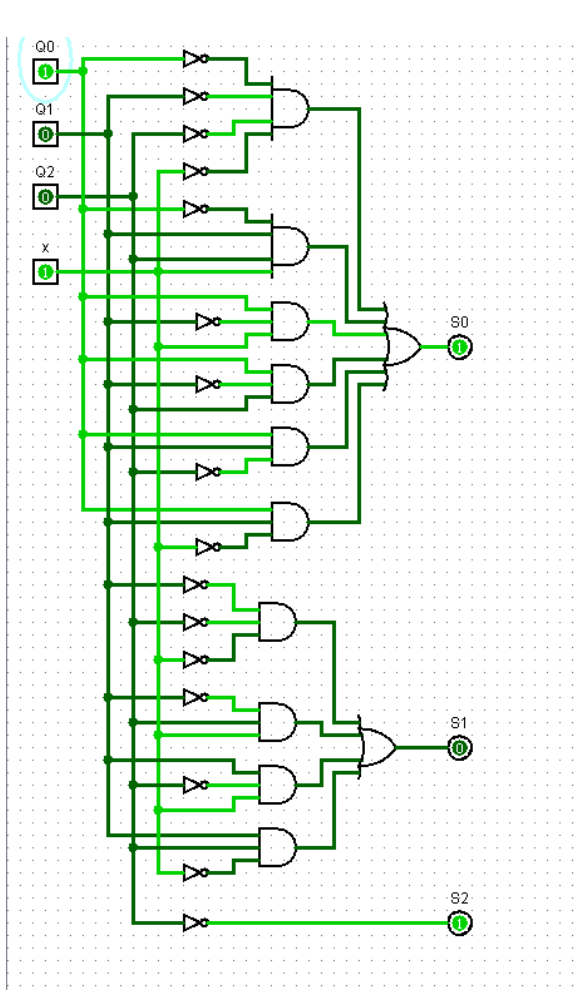


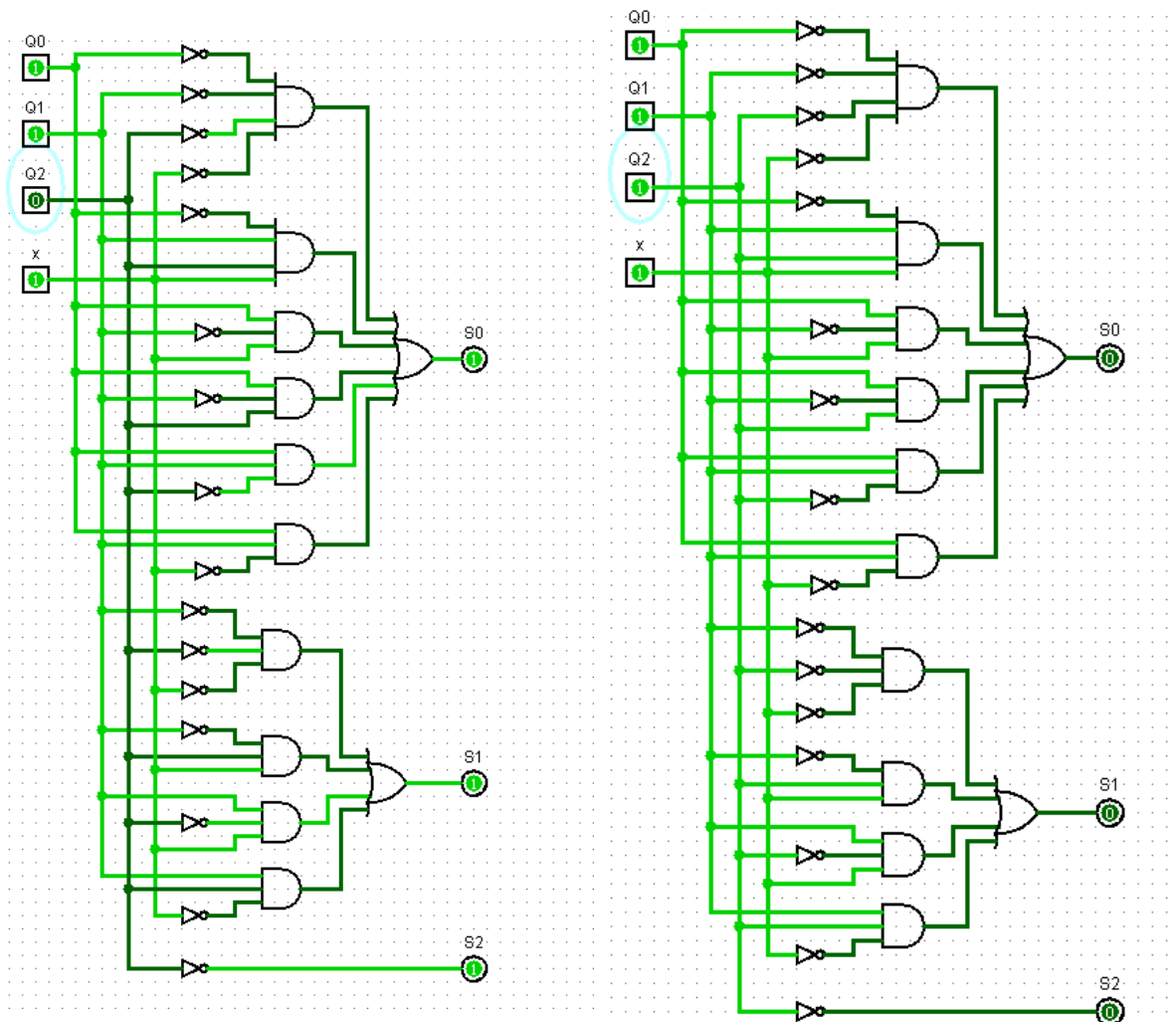


Testy funkcji dla x=1:





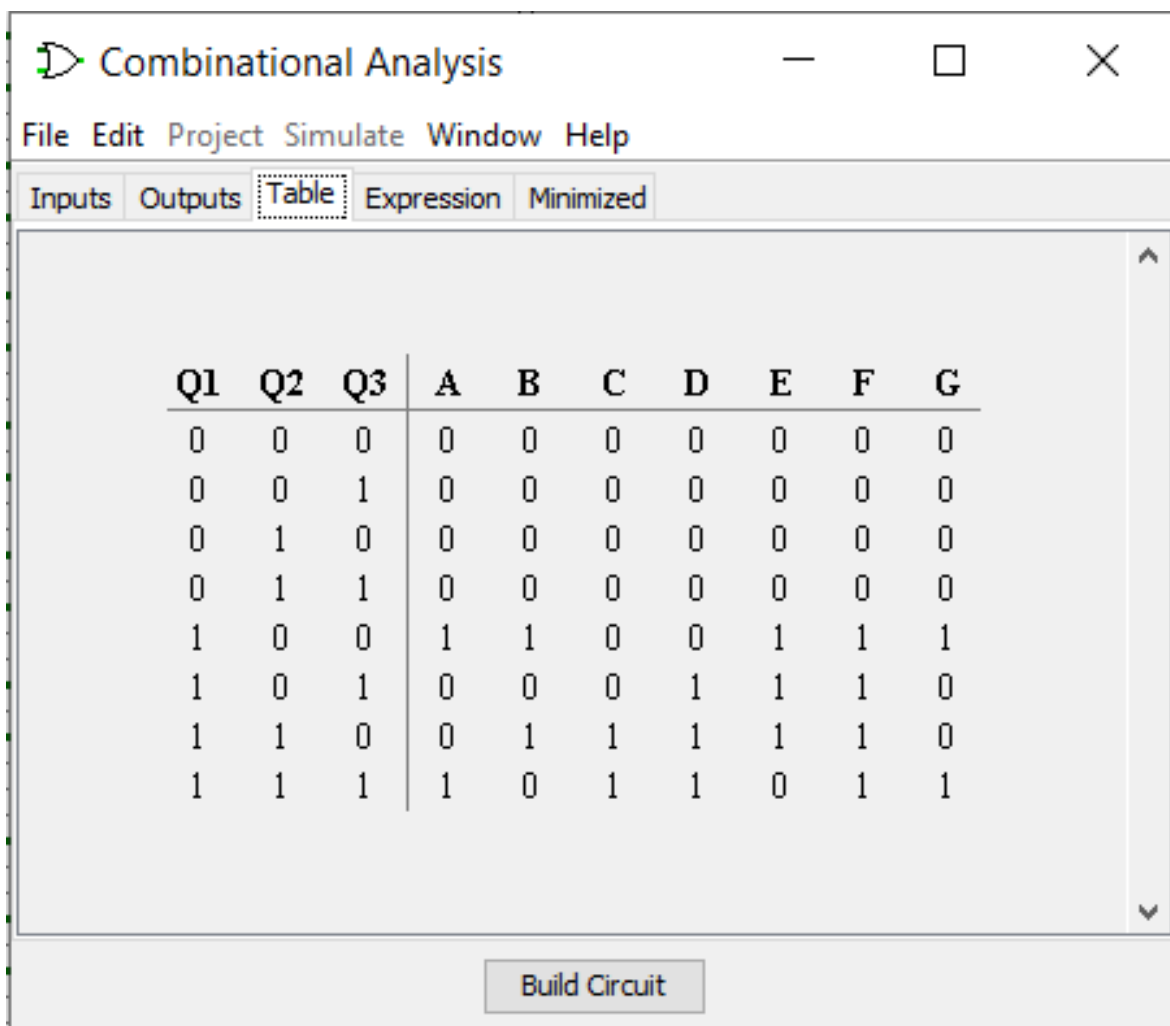




Wszystkie testy przebiegły pomyślnie.

4 Funkcje zmieniające numer stanu na litery

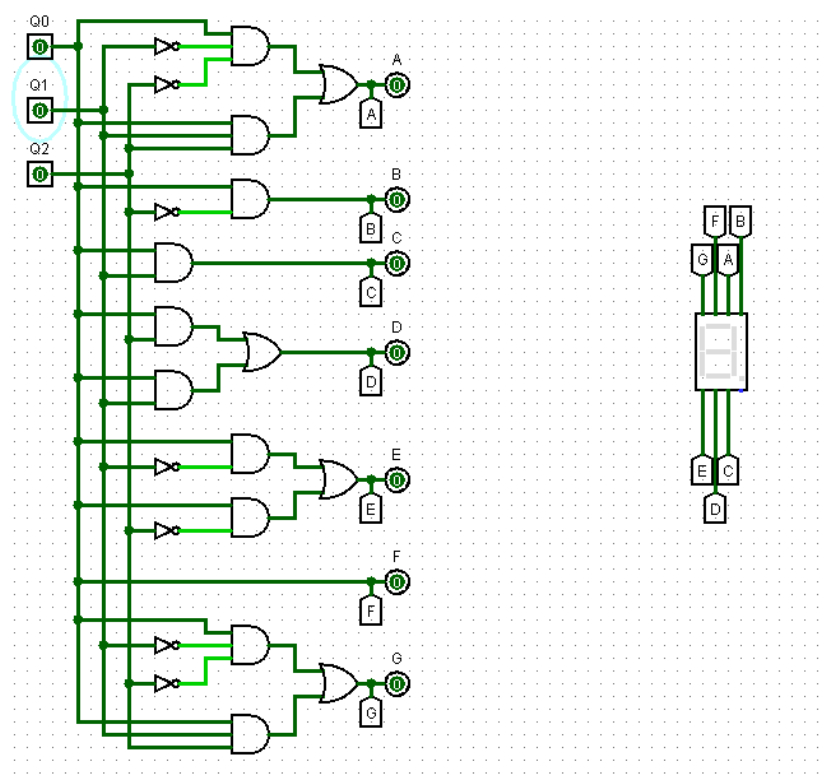
4.1 Wyświetlacz 1 (od lewej)



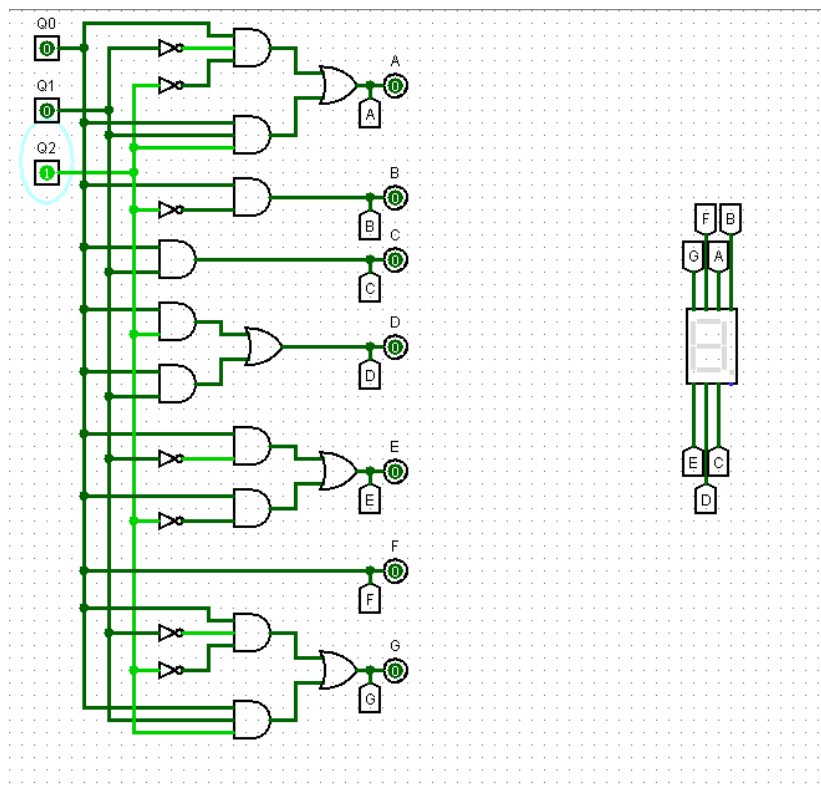
Q1	Q2	Q3	A	B	C	D	E	F	G
0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0
0	1	1	0	0	0	0	0	0	0
1	0	0	1	1	0	0	1	1	1
1	0	1	0	0	0	1	1	1	0
1	1	0	0	1	1	1	1	1	0
1	1	1	1	0	1	1	0	1	1

Rysunek 13: Tablica prawdy.

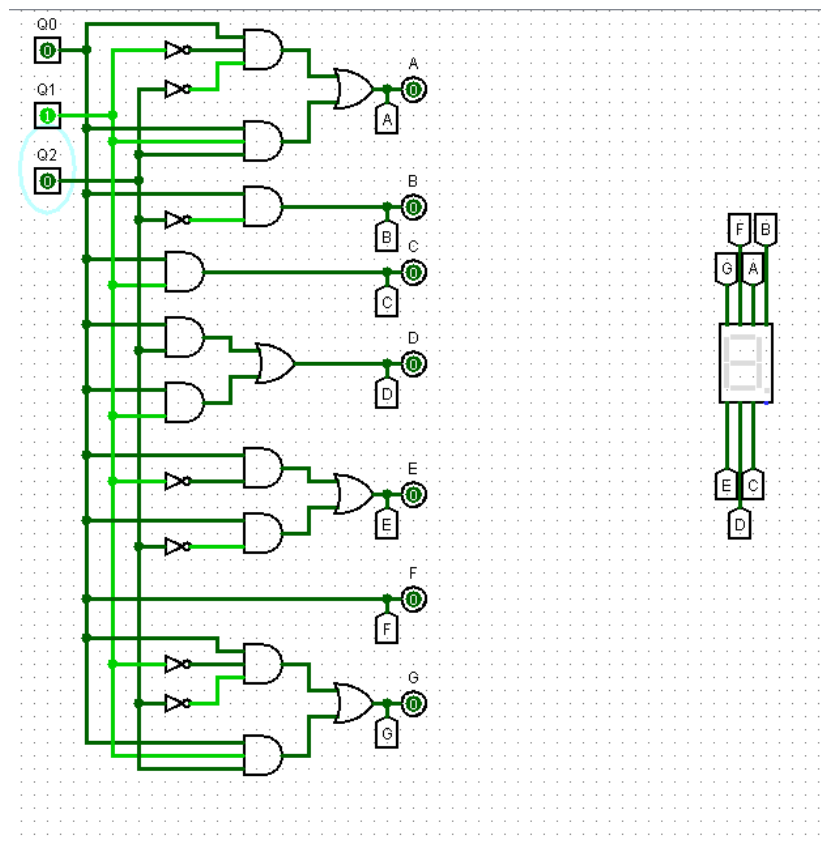
Stan 000



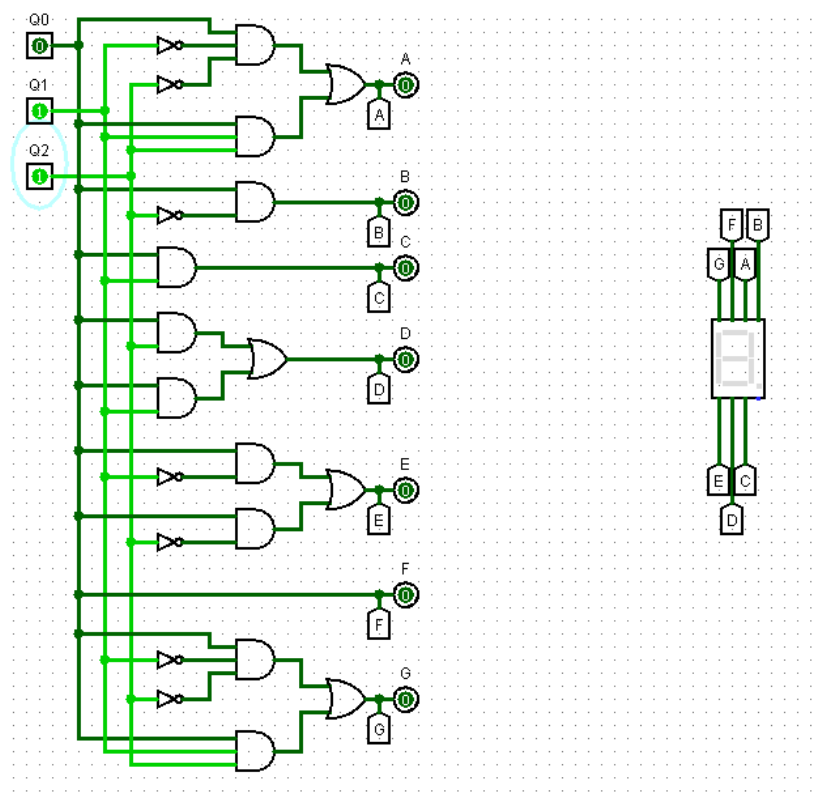
Stan 001



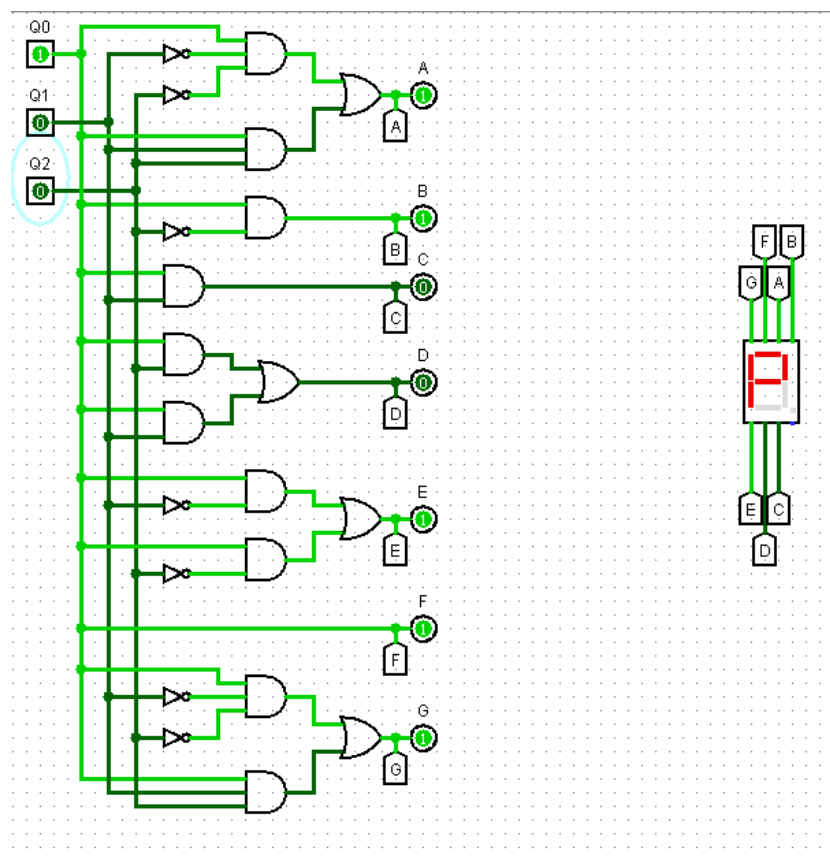
Stan 010



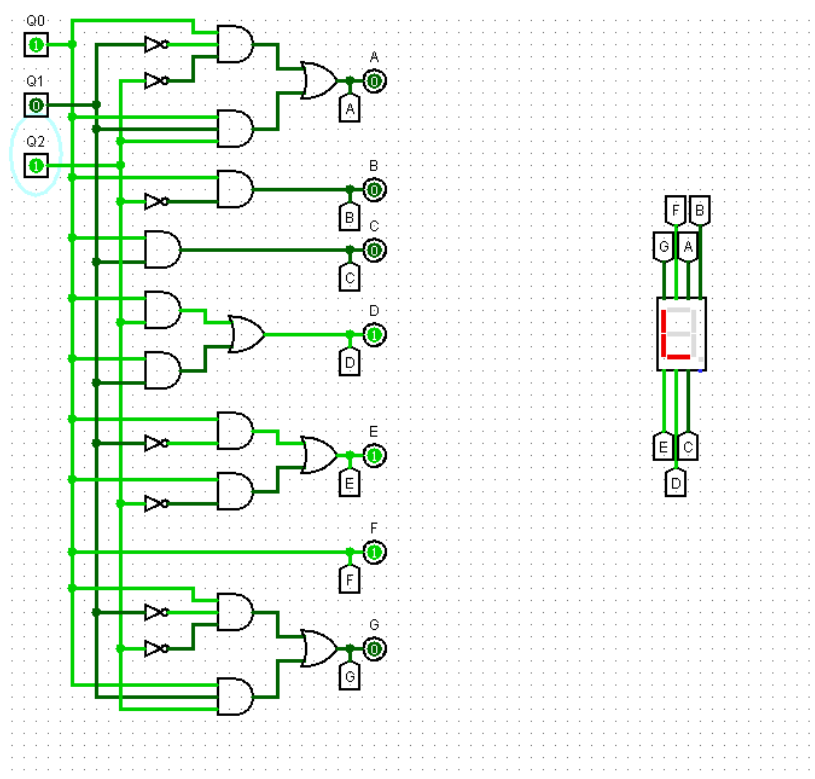
Stan 011



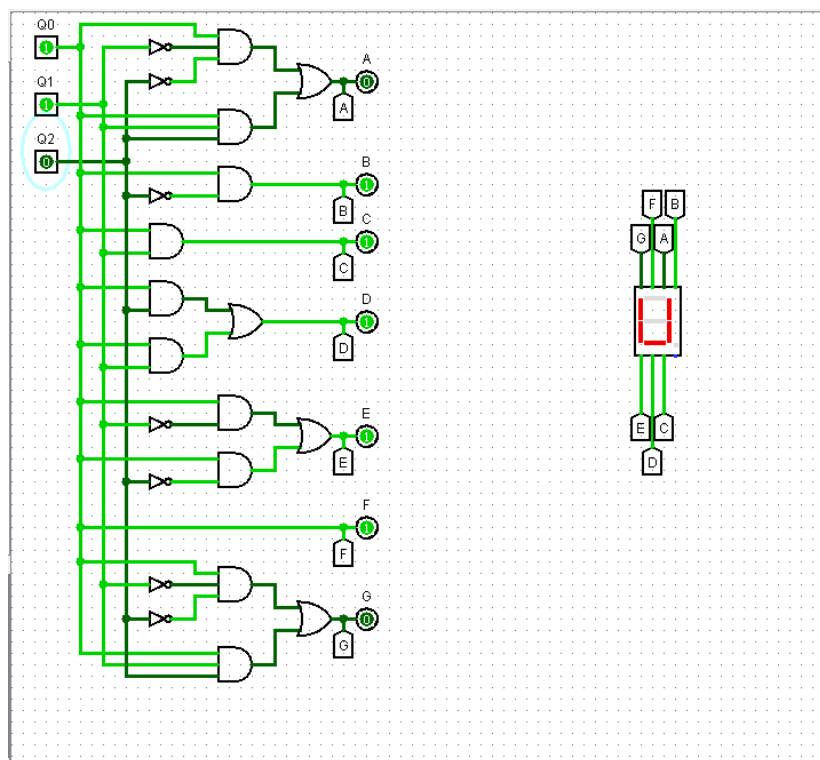
Stan 100



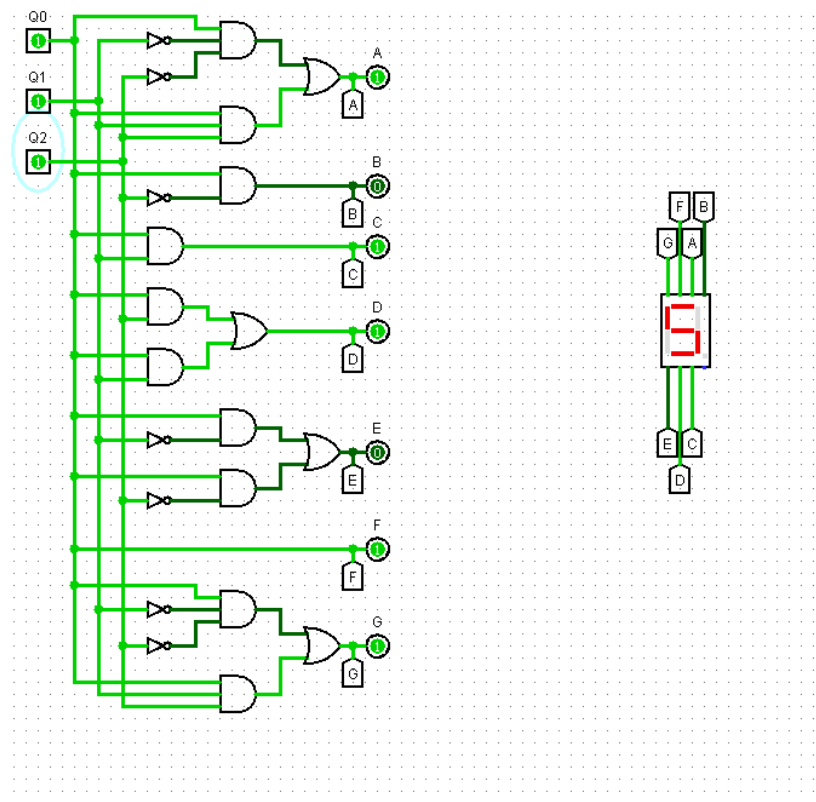
Stan 101



Stan 110



Stan 111



4.2 Wyświetlacz 2

Combinational Analysis

File Edit Project Simulate Window Help

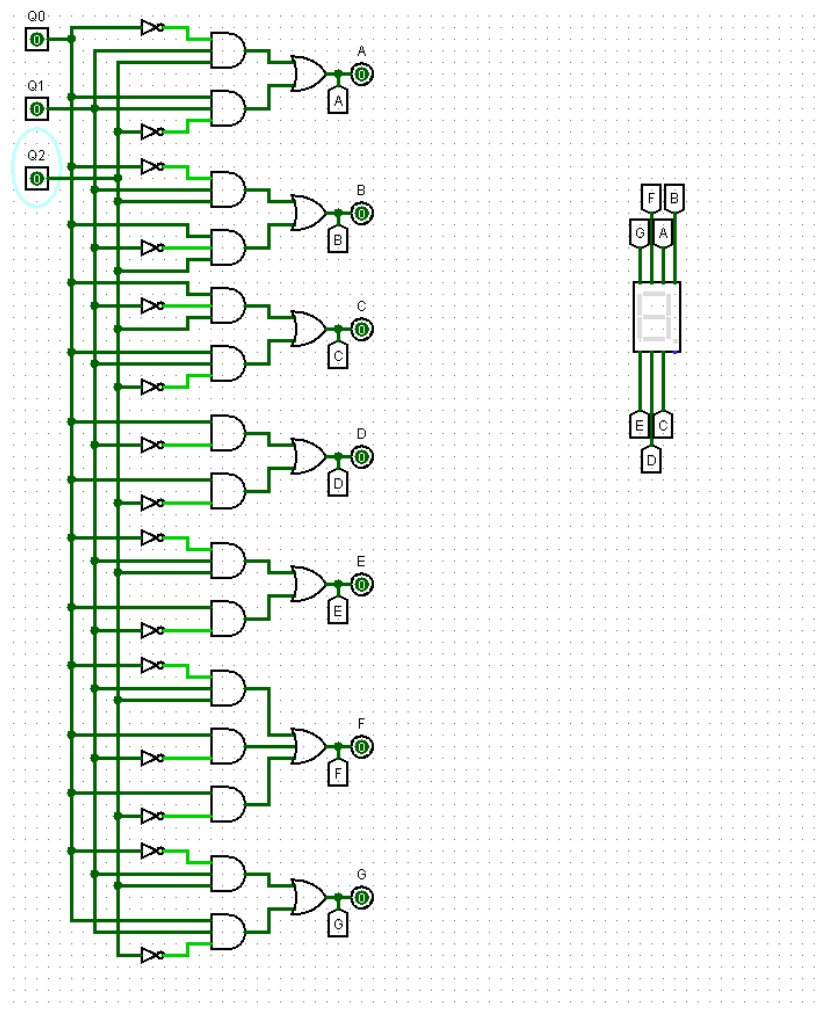
Inputs Outputs **Table** Expression Minimized

Q1	Q2	Q3	A	B	C	D	E	F	G
0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0
0	1	1	1	1	0	0	1	1	1
1	0	0	0	0	0	1	1	1	0
1	0	1	0	1	1	1	1	1	0
1	1	0	1	0	1	1	0	1	1
1	1	1	0	0	0	0	0	0	0

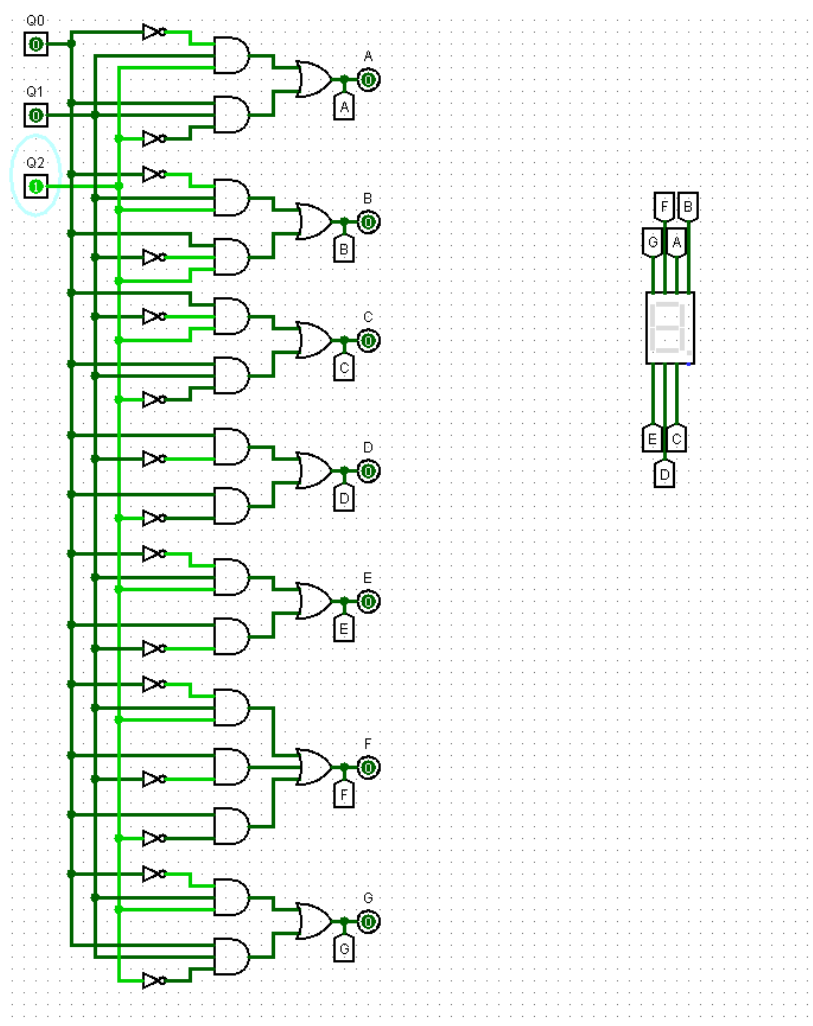
Build Circuit

Rysunek 14: Tablica prawdy.

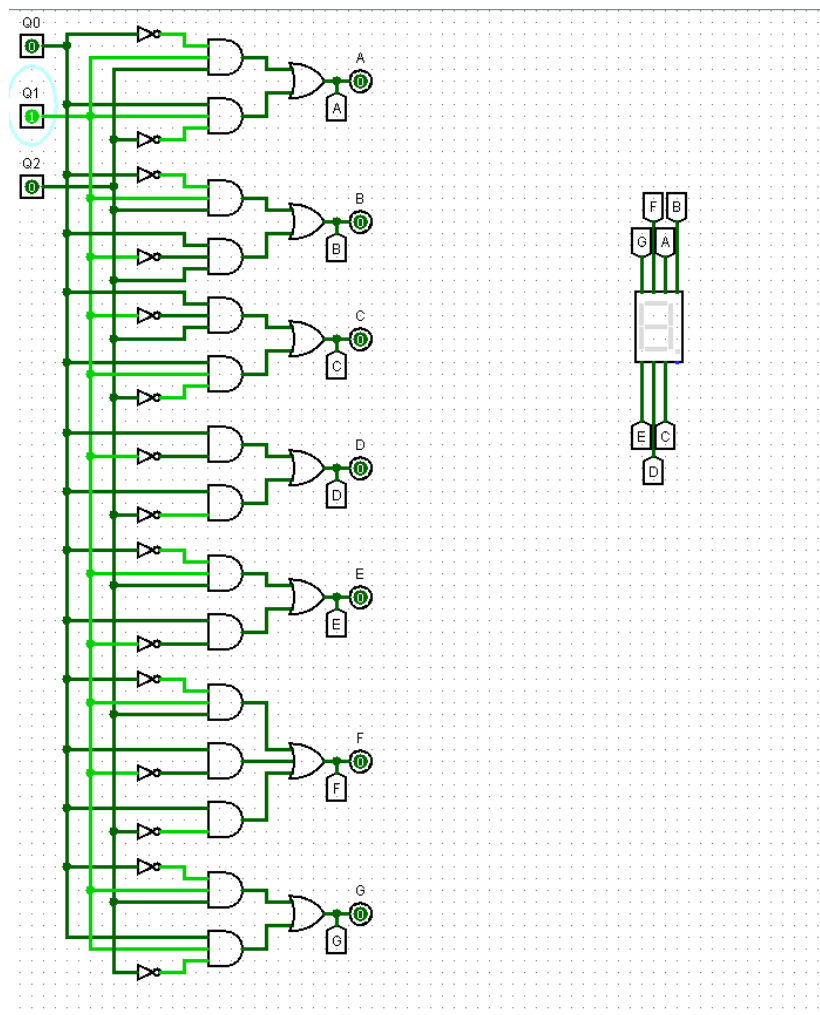
Stan 000



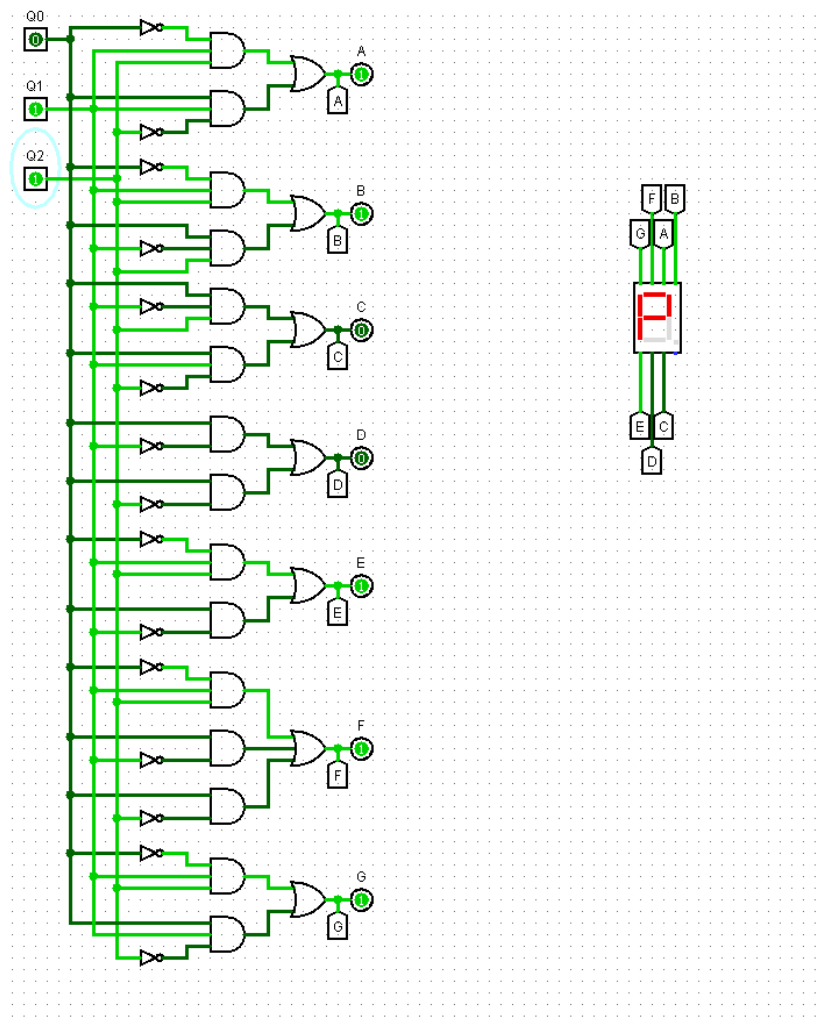
Stan 001



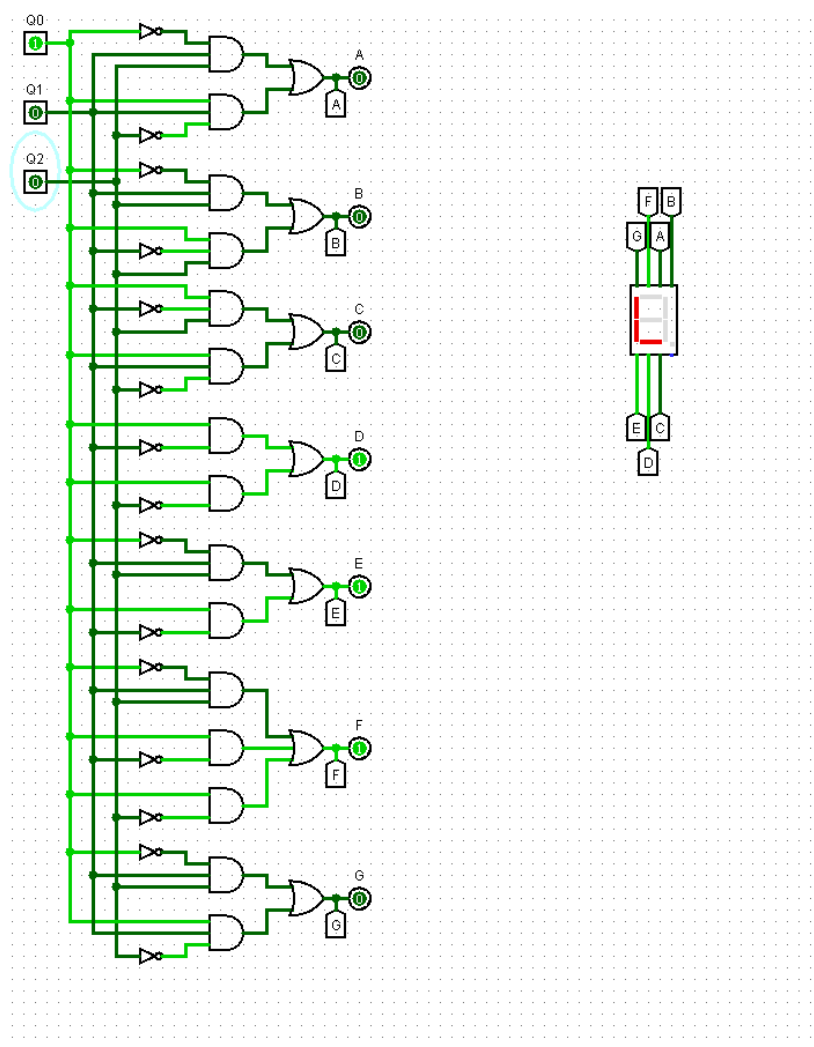
Stan 010

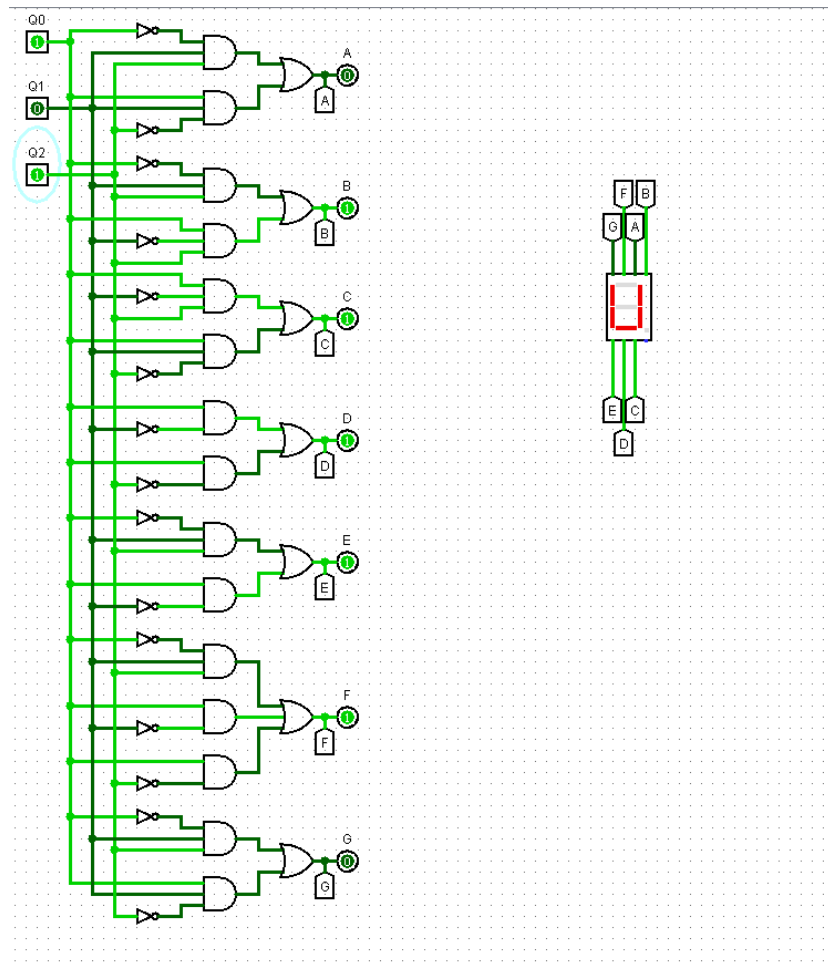


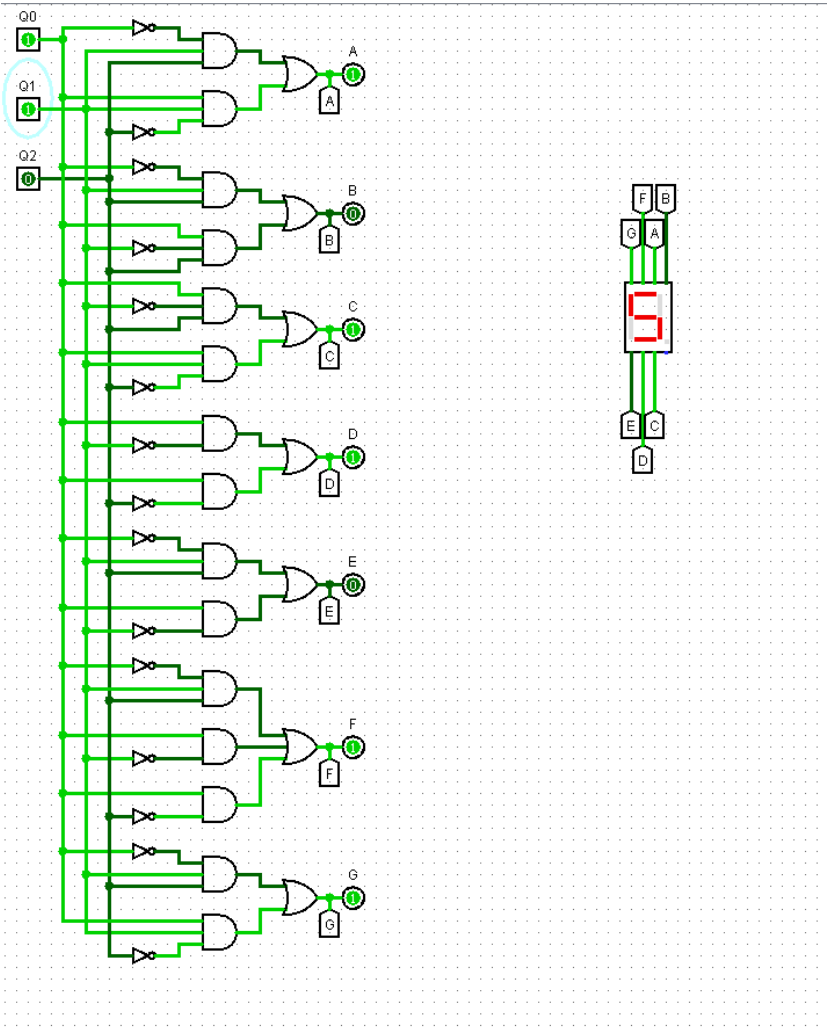
Stan 011

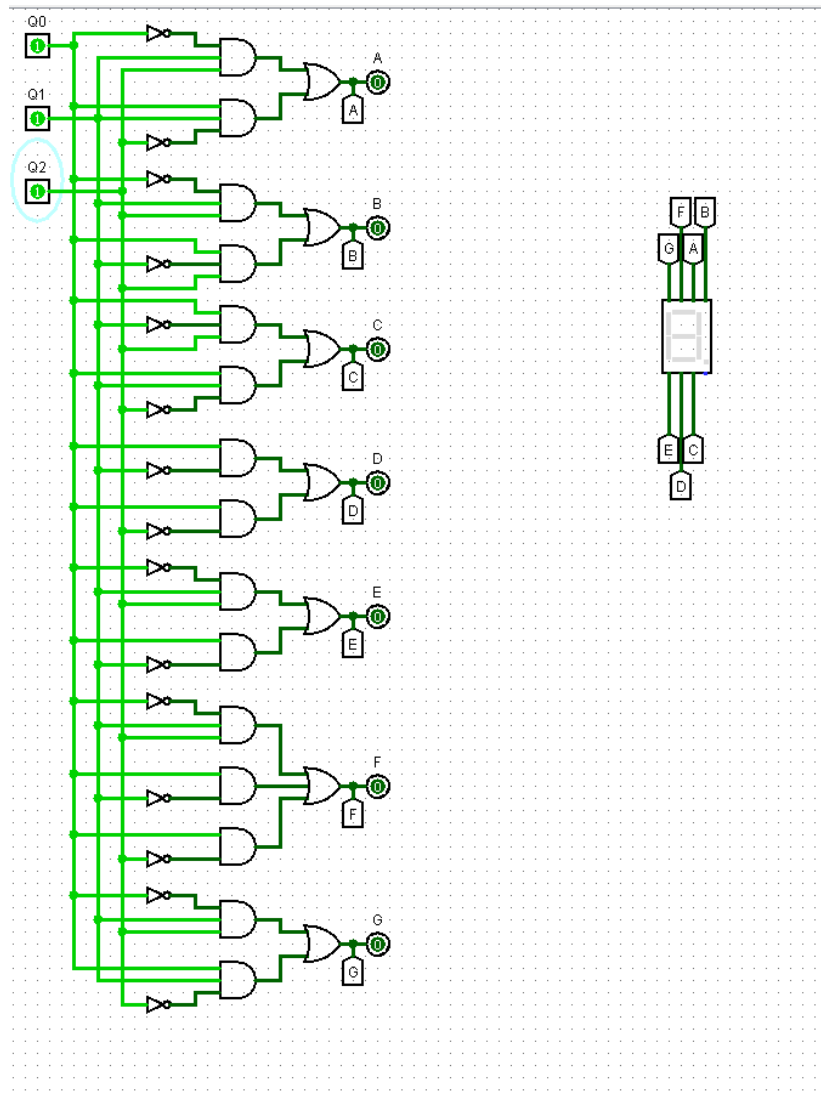


Stan 100

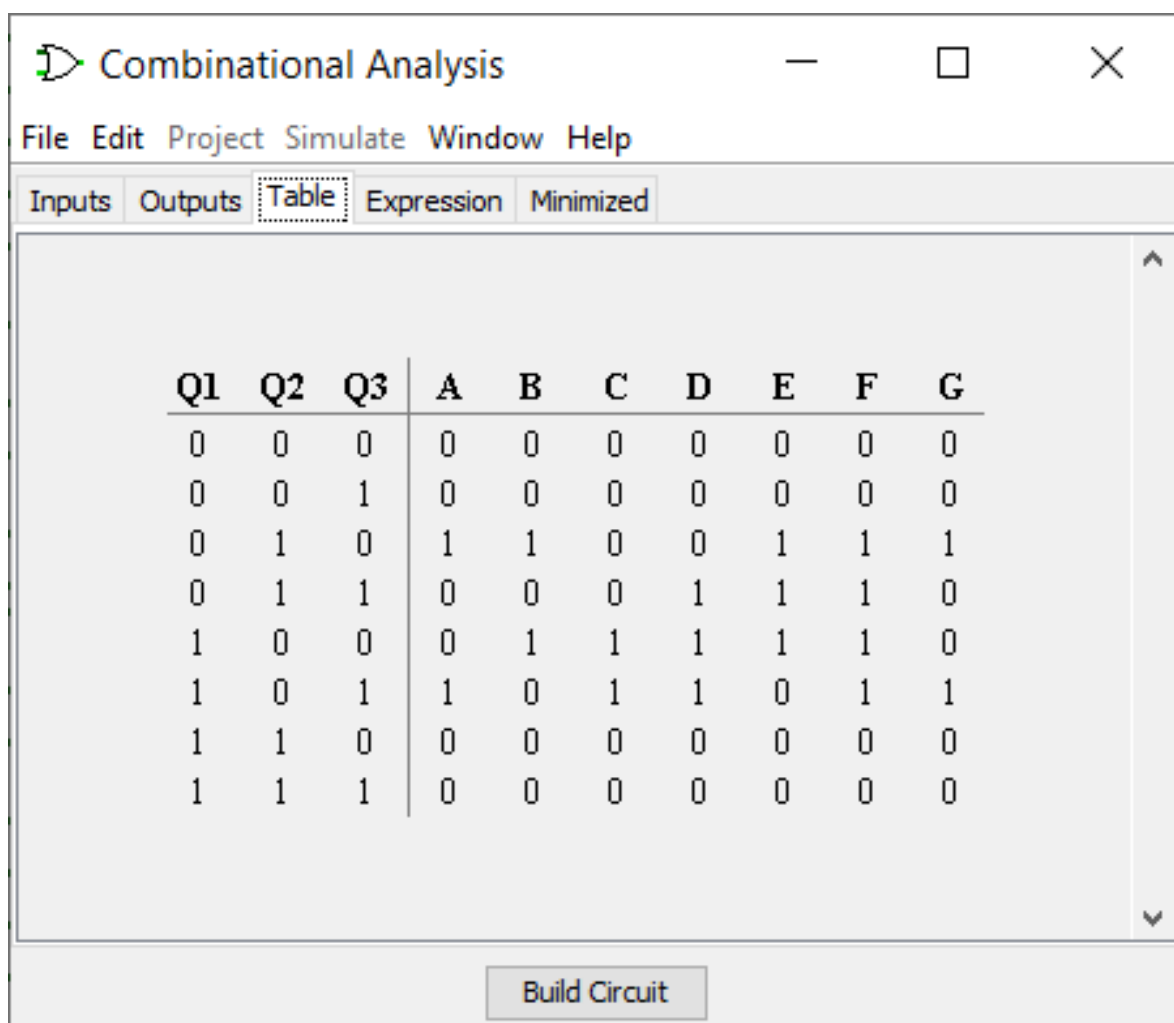








4.3 Wyświetlacz 3

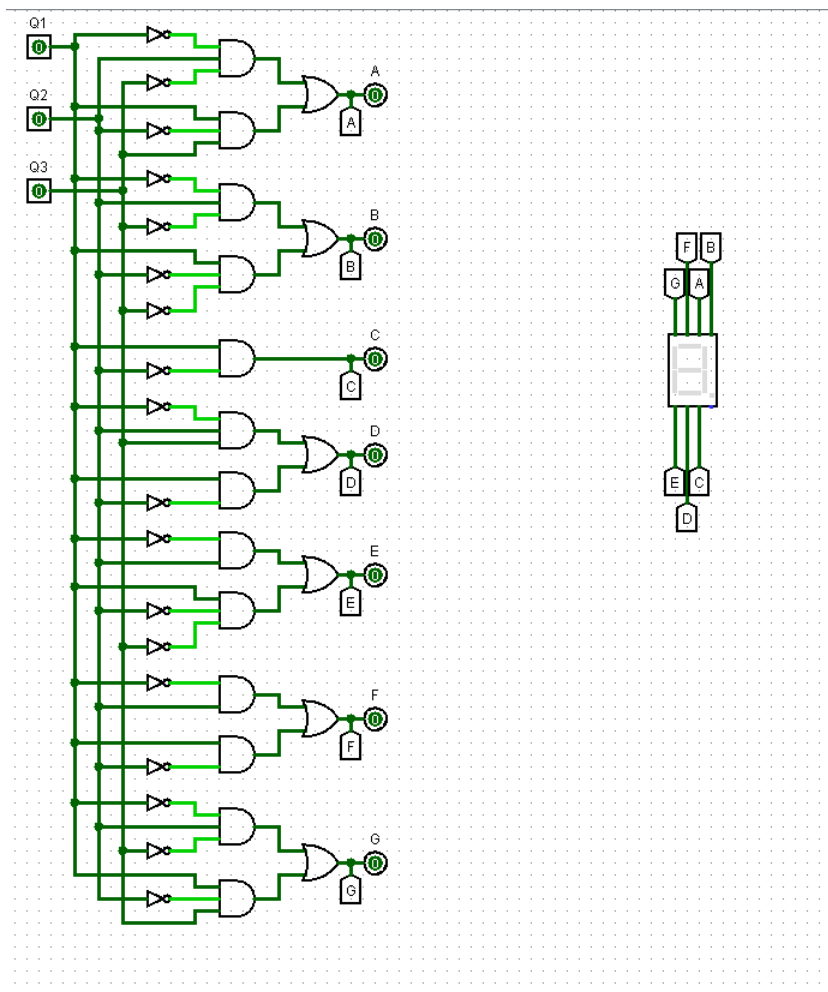


The screenshot shows a software window titled "Combinational Analysis" with a menu bar (File, Edit, Project, Simulate, Window, Help) and a tabbed interface. The "Table" tab is selected, displaying a truth table with 8 rows and 10 columns. The columns are labeled Q1, Q2, Q3, A, B, C, D, E, F, and G. The table contains binary values (0 and 1) for each row. A "Build Circuit" button is located at the bottom of the window.

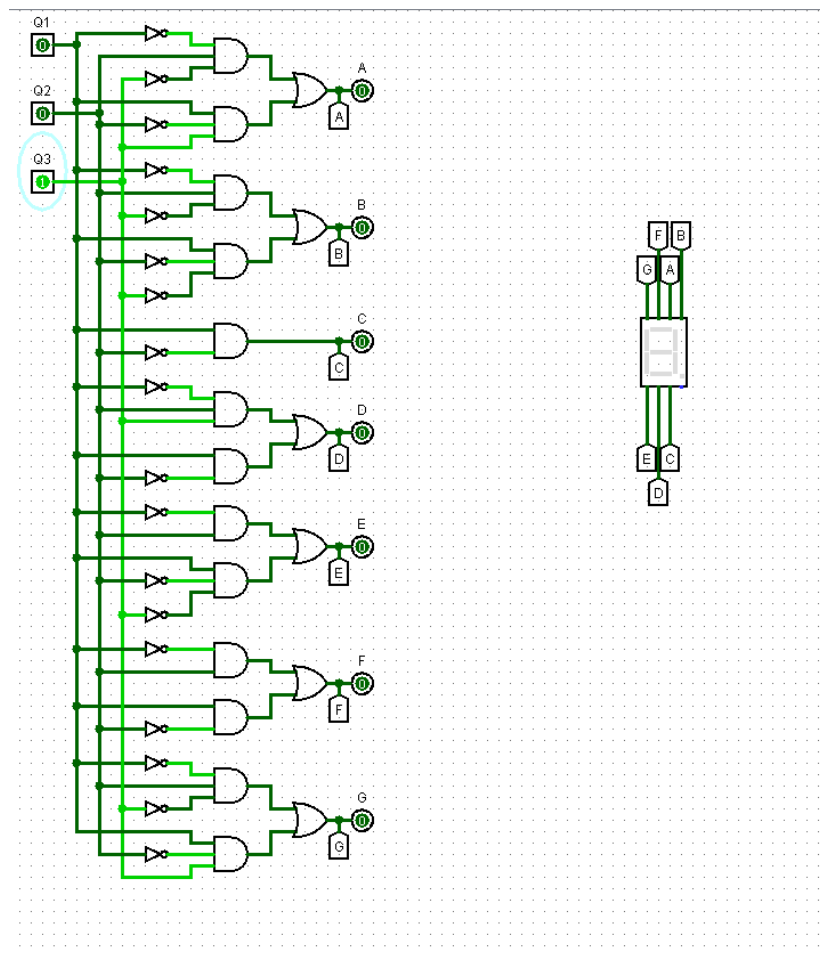
Q1	Q2	Q3	A	B	C	D	E	F	G
0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0
0	1	0	1	1	0	0	1	1	1
0	1	1	0	0	0	1	1	1	0
1	0	0	0	1	1	1	1	1	0
1	0	1	1	0	1	1	0	1	1
1	1	0	0	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0

Rysunek 15: Tablica prawdy.

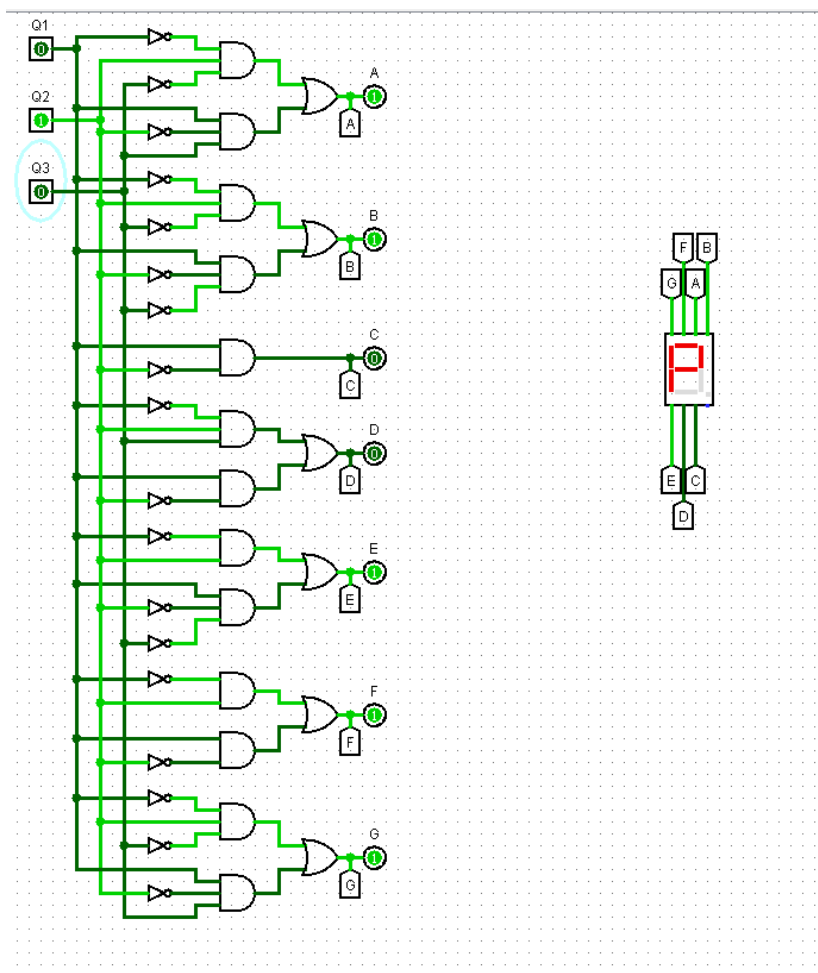
Stan 000



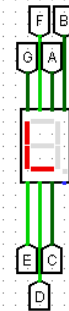
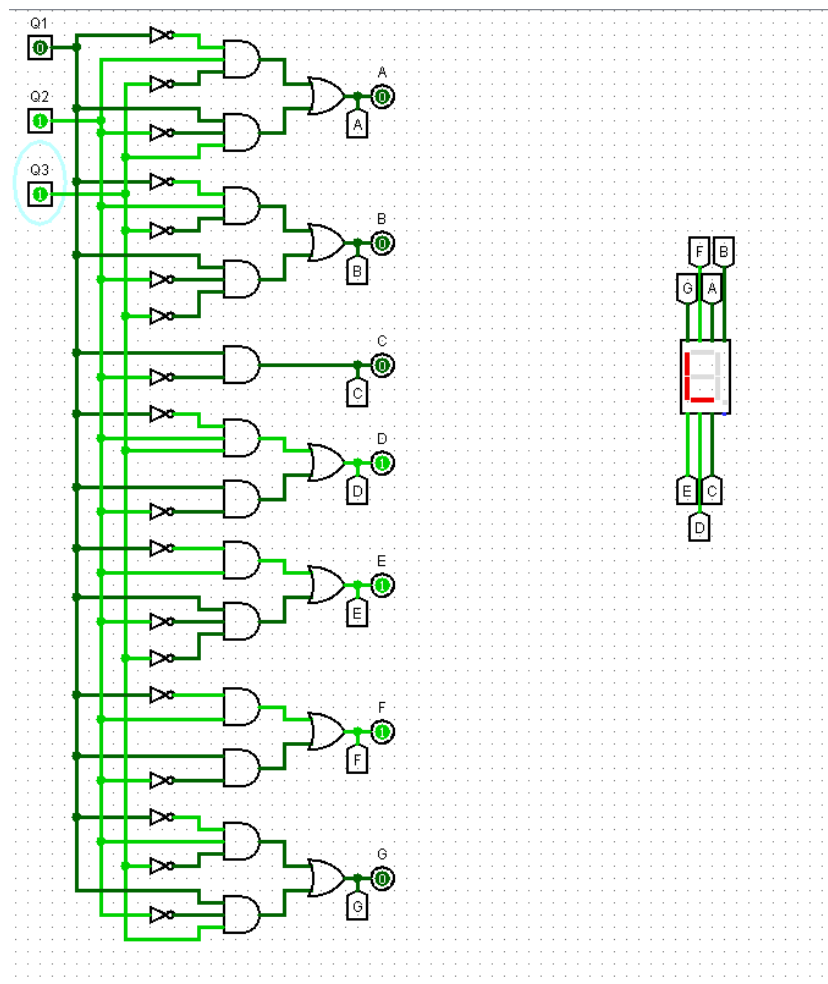
Stan 001

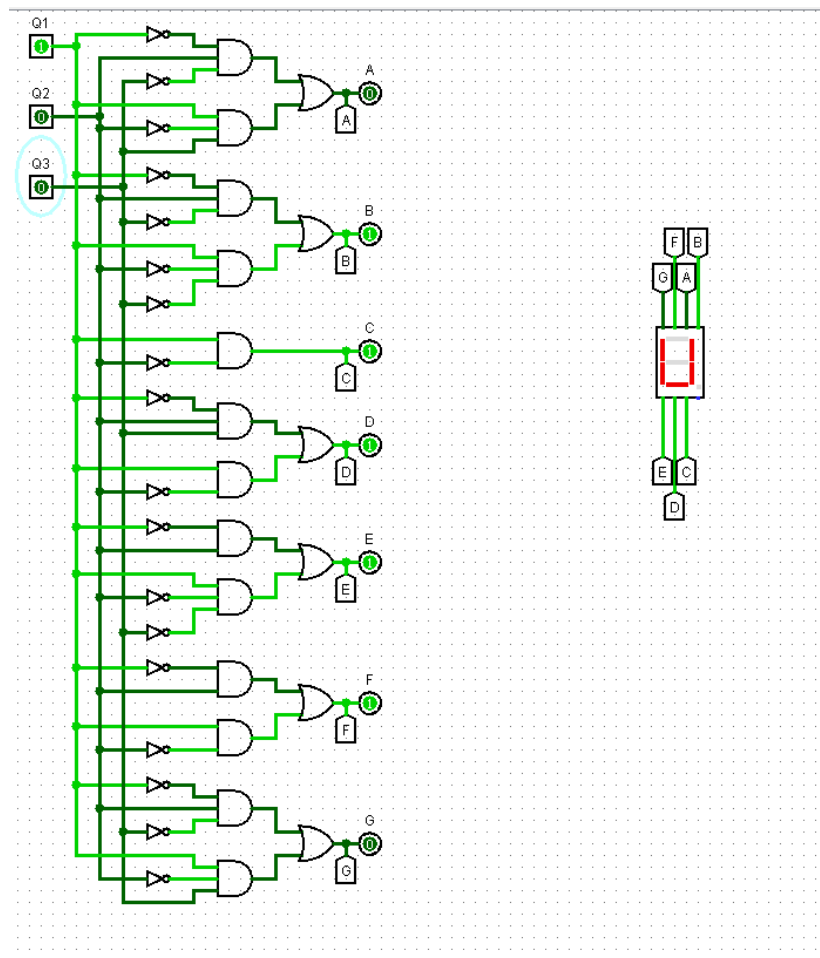


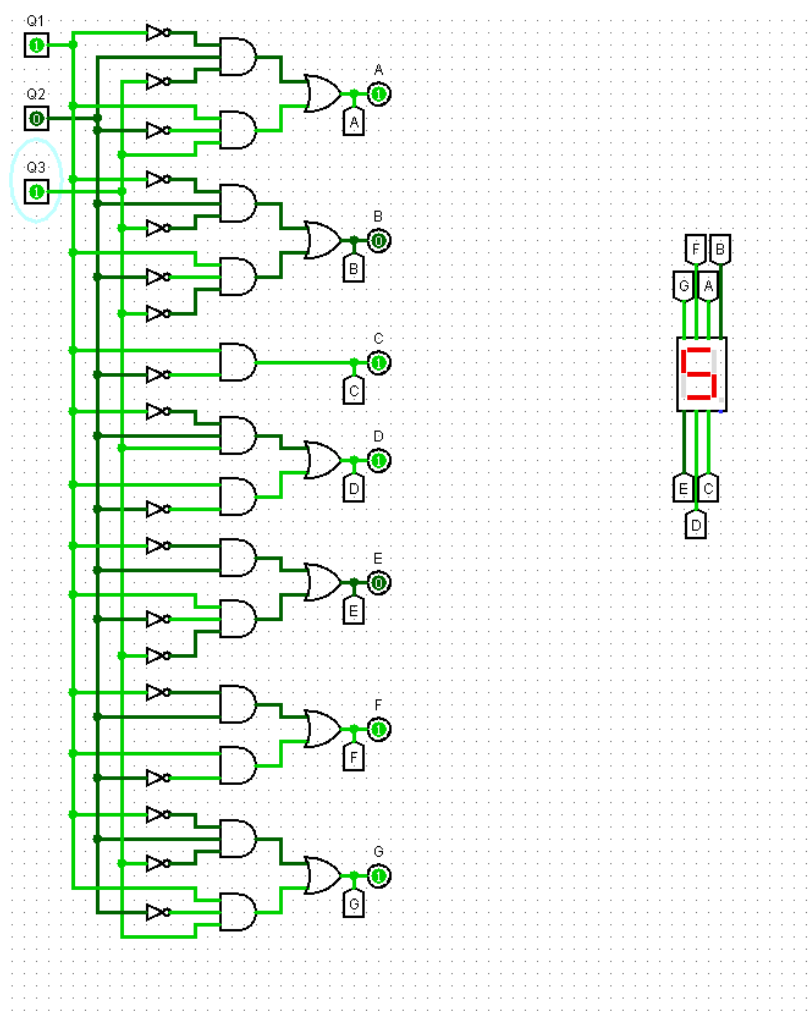
Stan 010



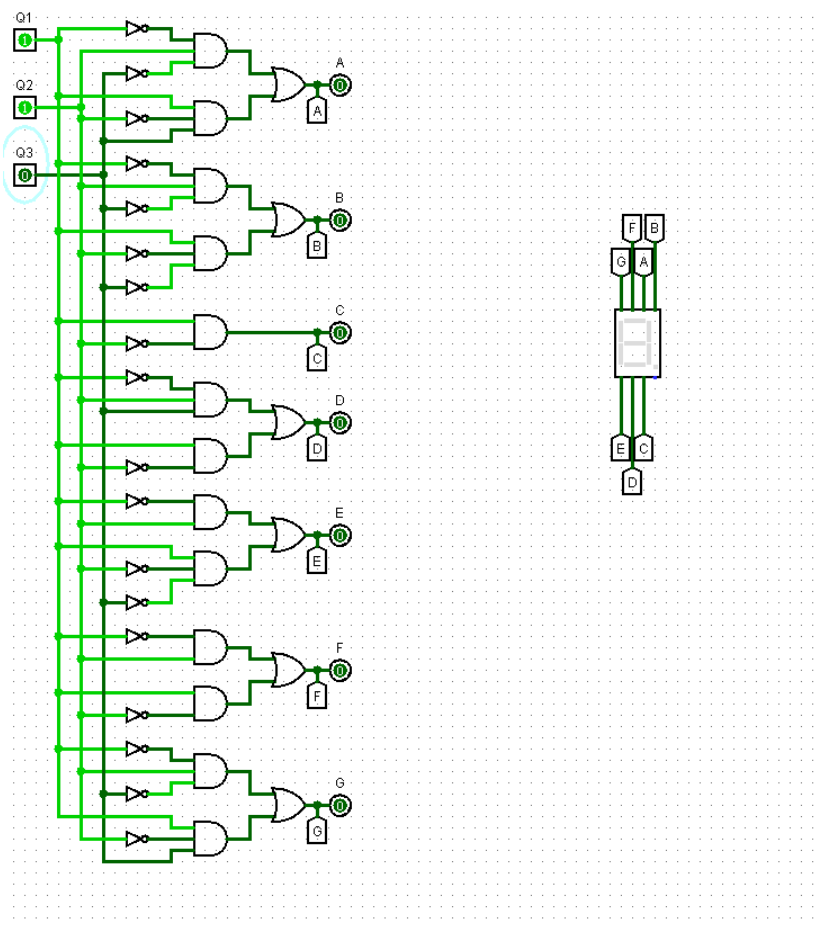
Stan 011



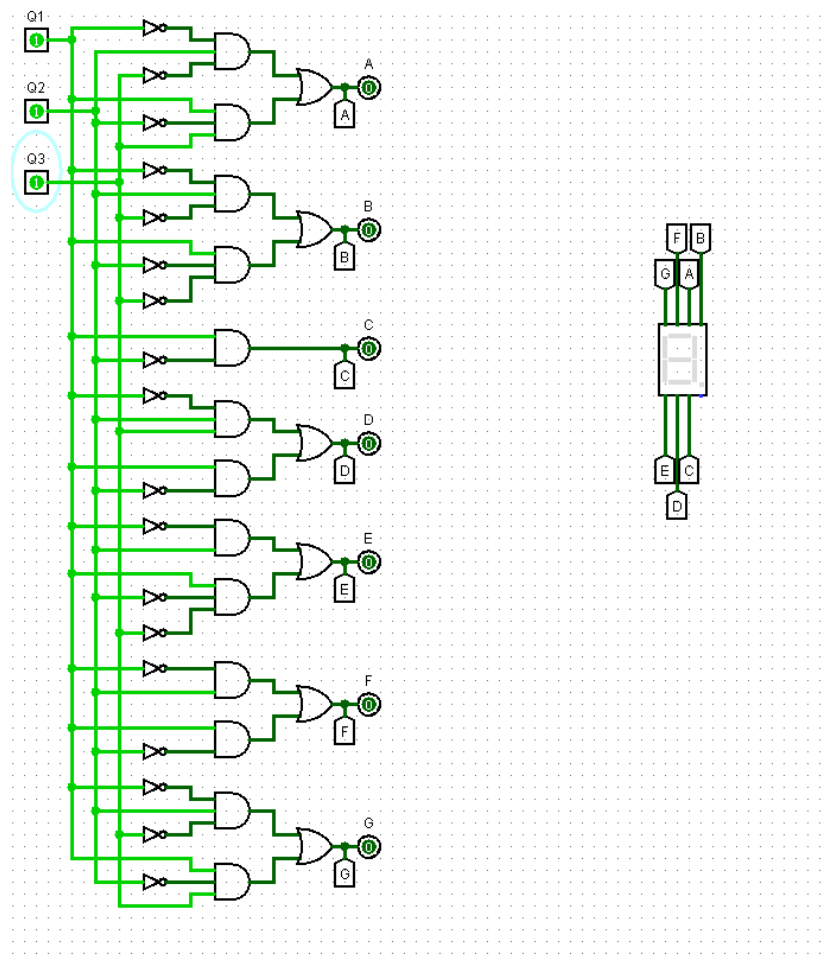




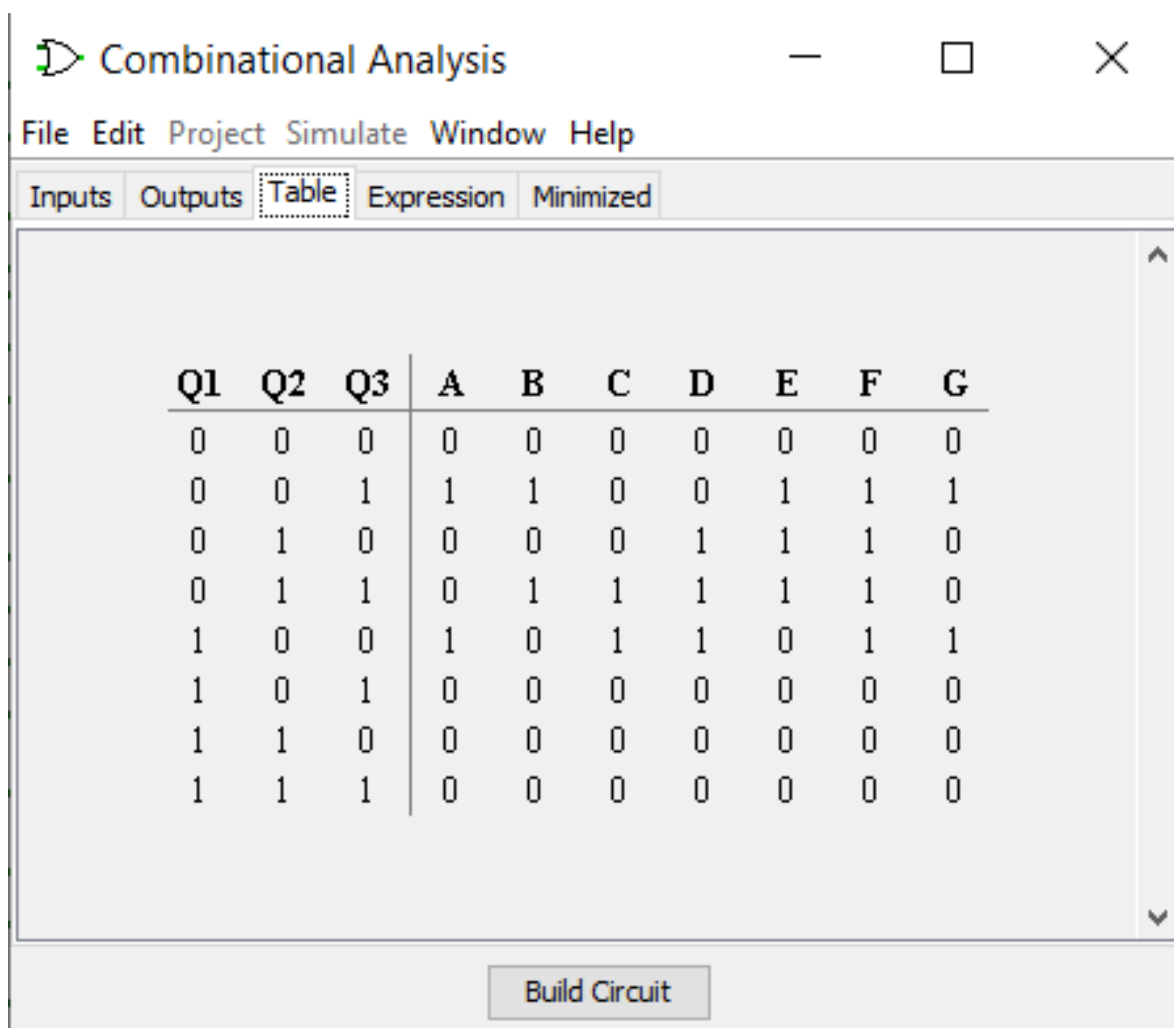
Stan 110



Stan 111



4.4 Wyświetlacz 4

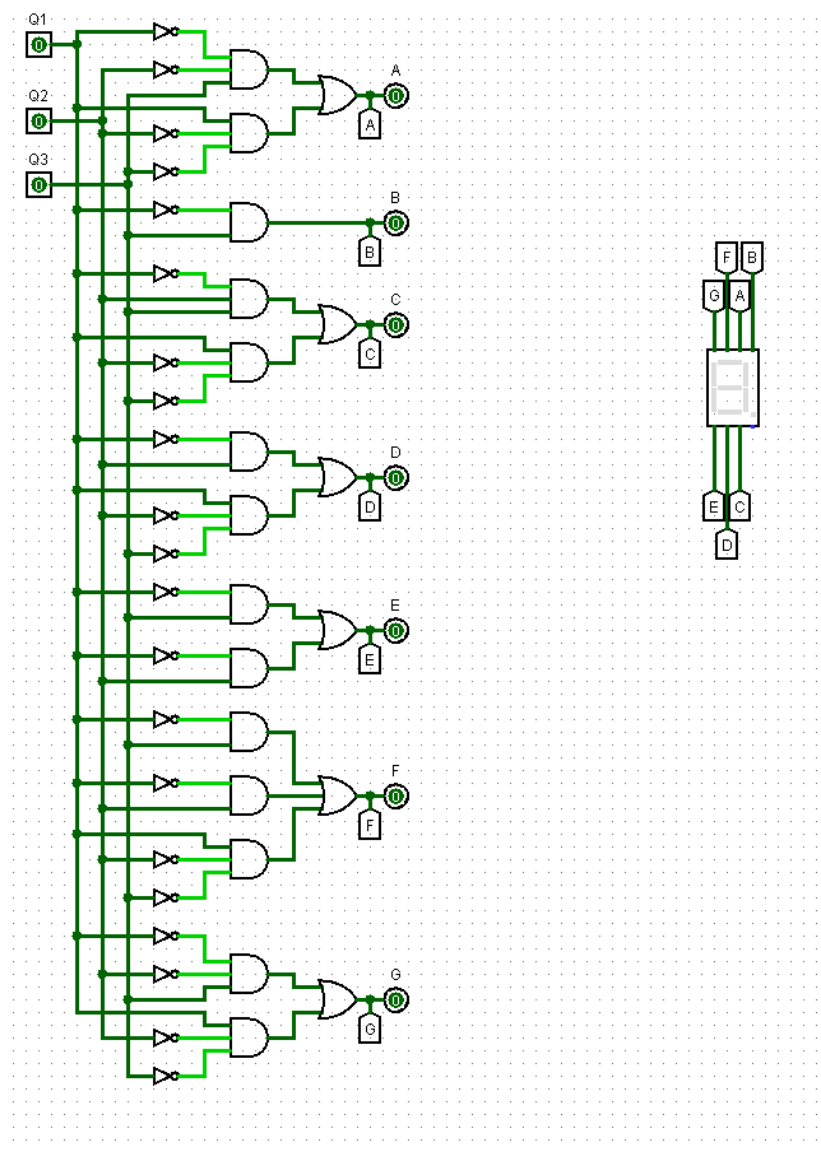


The screenshot shows a software window titled "Combinational Analysis" with a menu bar (File, Edit, Project, Simulate, Window, Help) and a tabbed interface. The "Table" tab is selected, displaying a truth table with 10 rows and 10 columns. The columns are labeled Q1, Q2, Q3, A, B, C, D, E, F, and G. The first three columns (Q1, Q2, Q3) represent the inputs, and the remaining seven columns (A through G) represent the outputs. The table contains binary values (0 and 1) for each combination of inputs. A "Build Circuit" button is located at the bottom of the window.

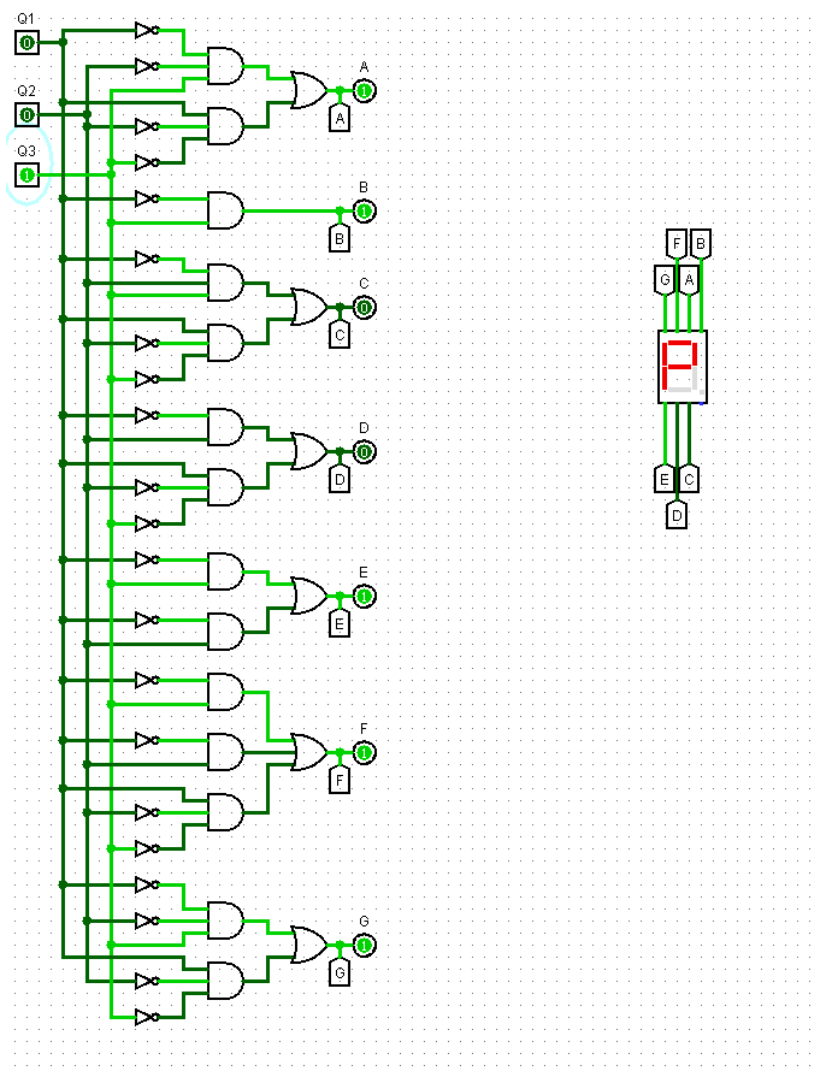
Q1	Q2	Q3	A	B	C	D	E	F	G
0	0	0	0	0	0	0	0	0	0
0	0	1	1	1	0	0	1	1	1
0	1	0	0	0	0	1	1	1	0
0	1	1	0	1	1	1	1	1	0
1	0	0	1	0	1	1	0	1	1
1	0	1	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0

Rysunek 16: Tablica prawdy.

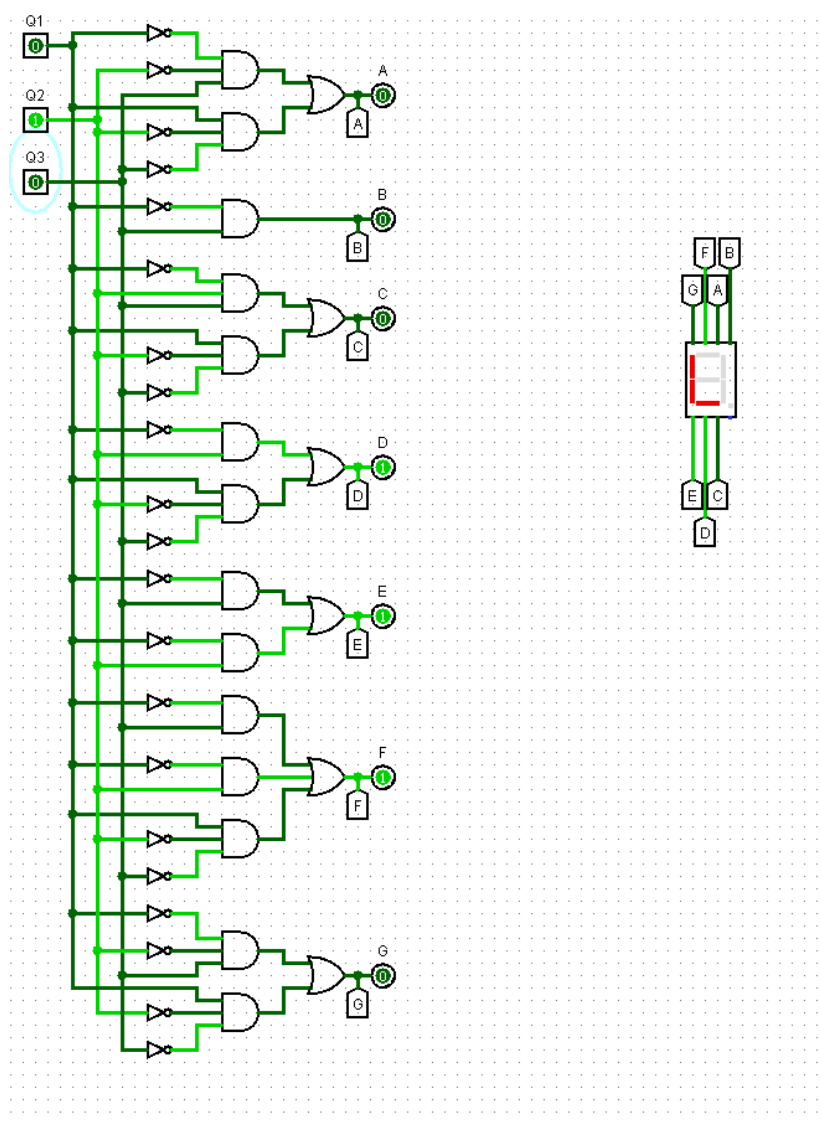
Stan 000



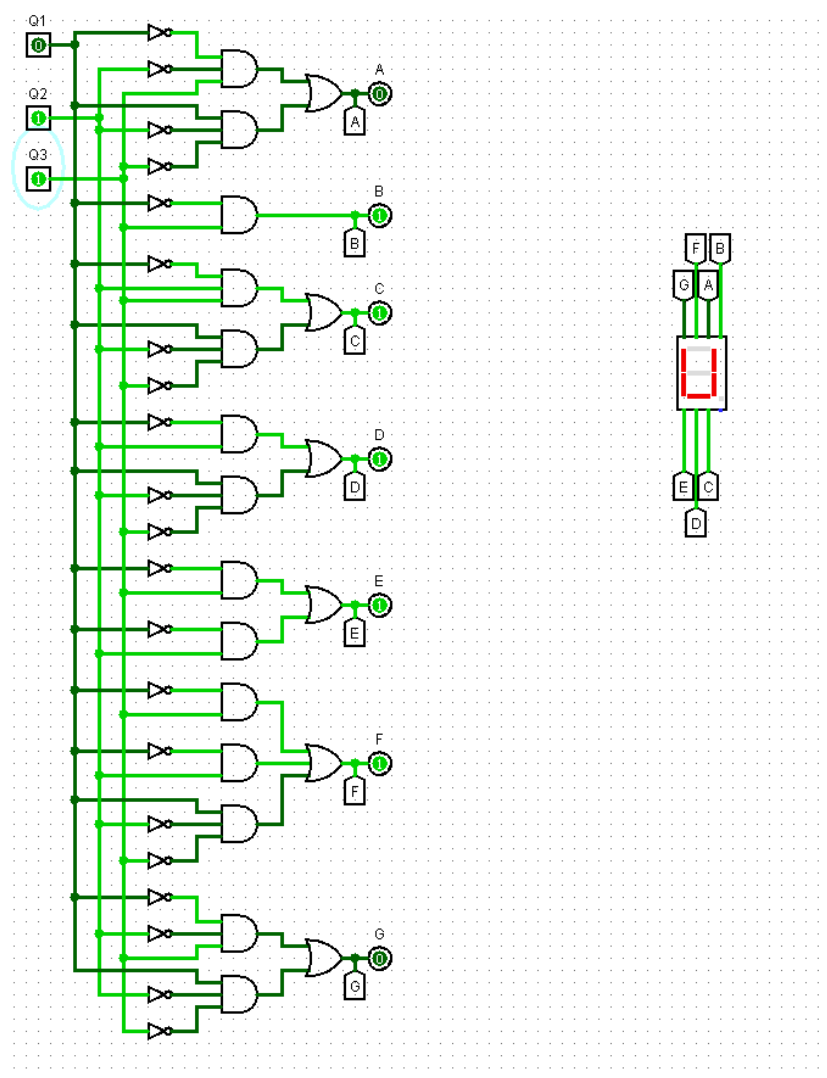
Stan 001



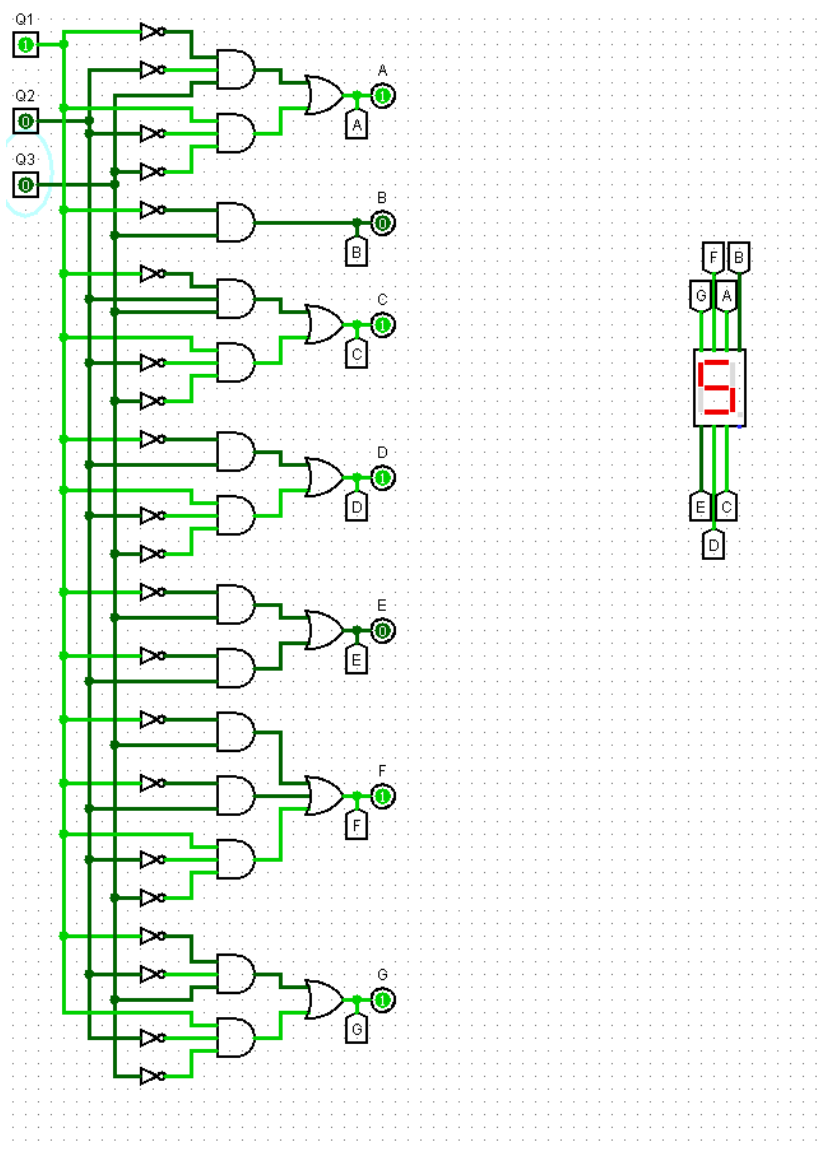
Stan 010

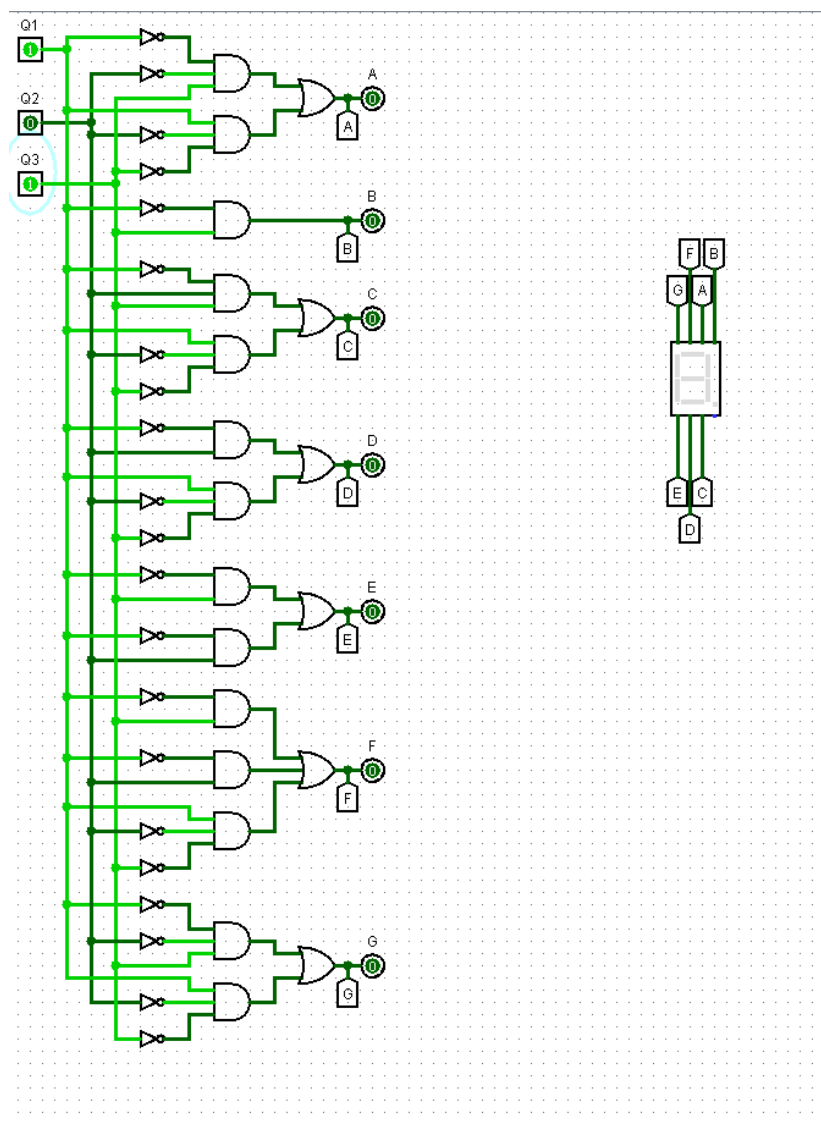


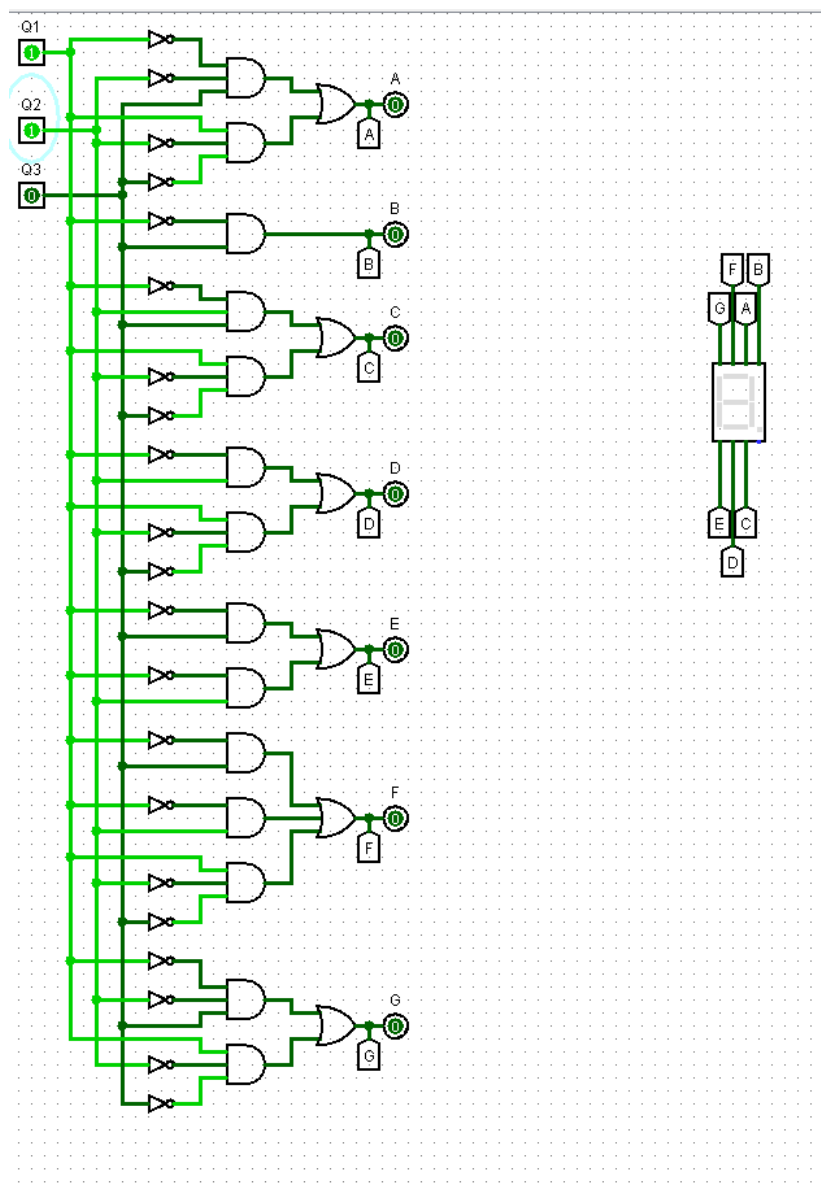
Stan 011



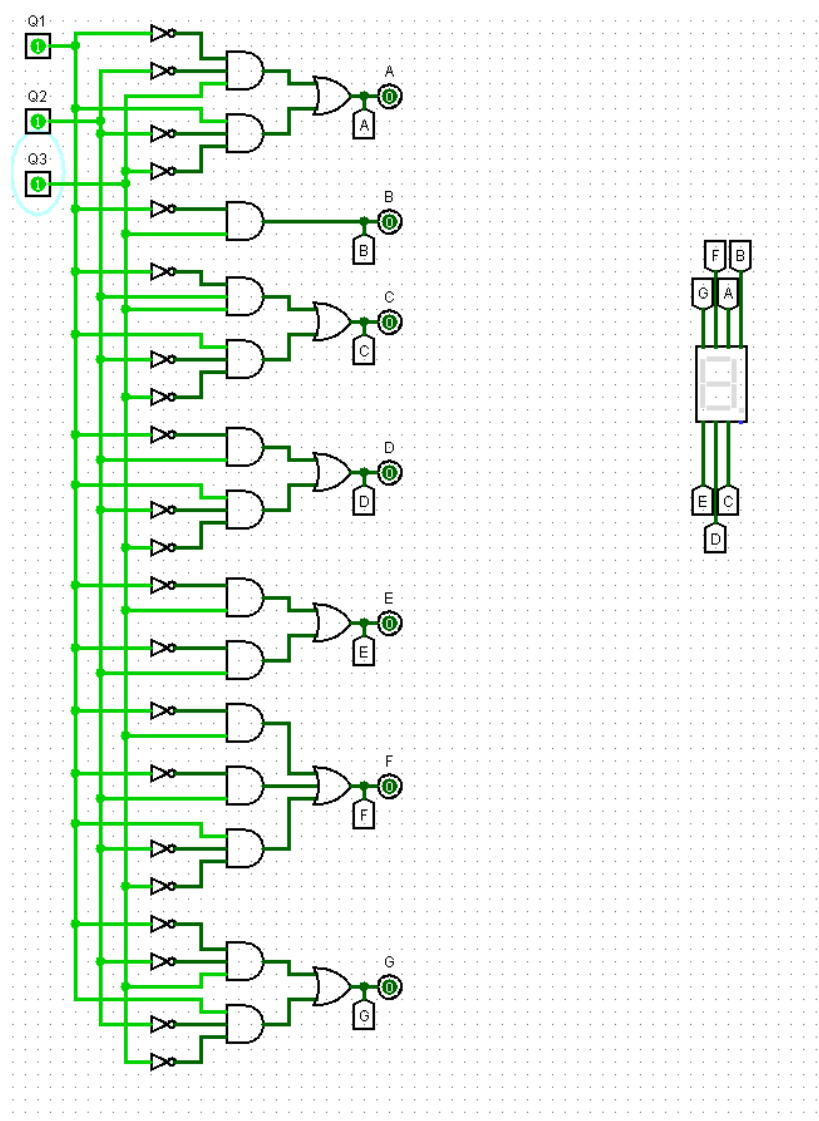
Stan 100





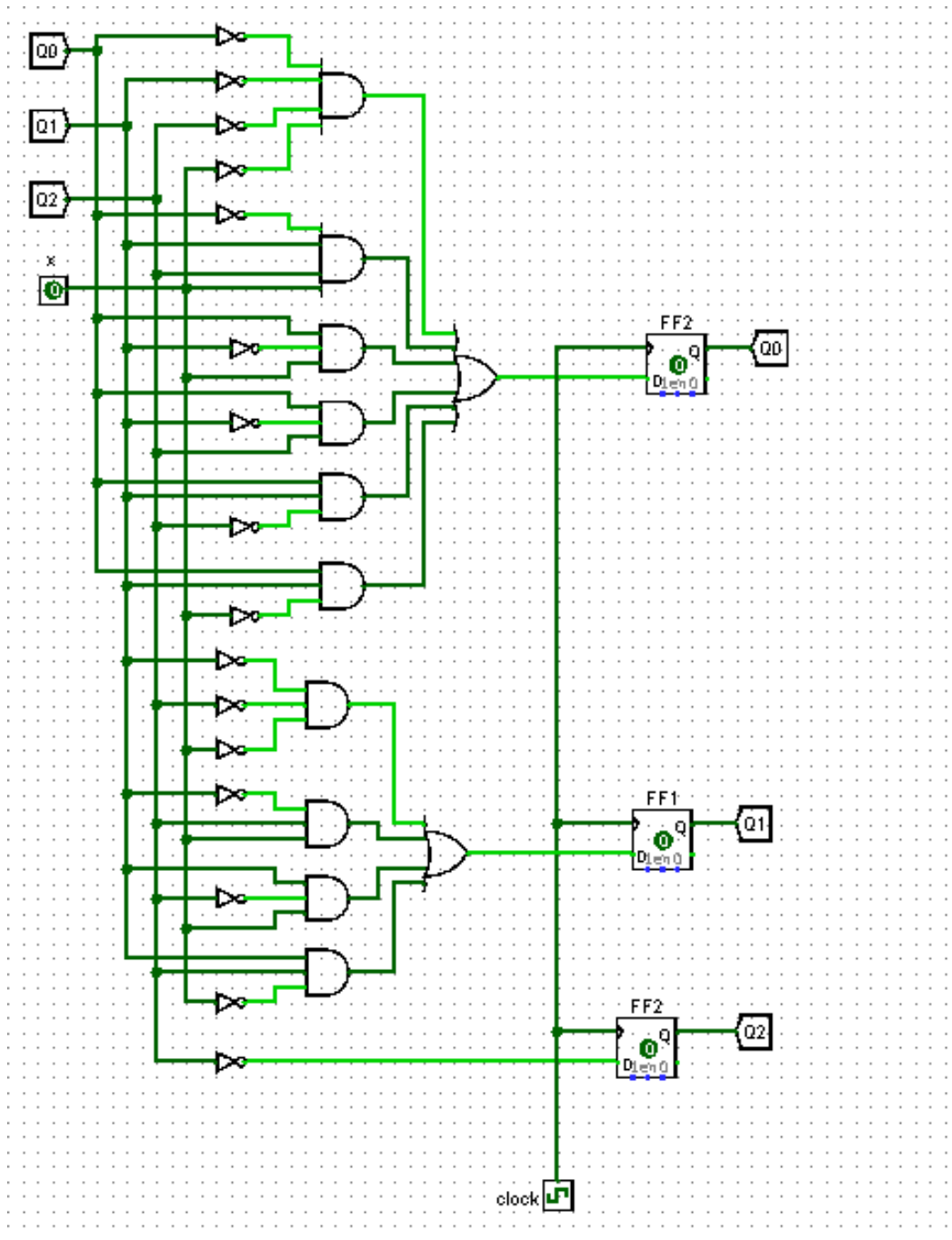


Stan 111

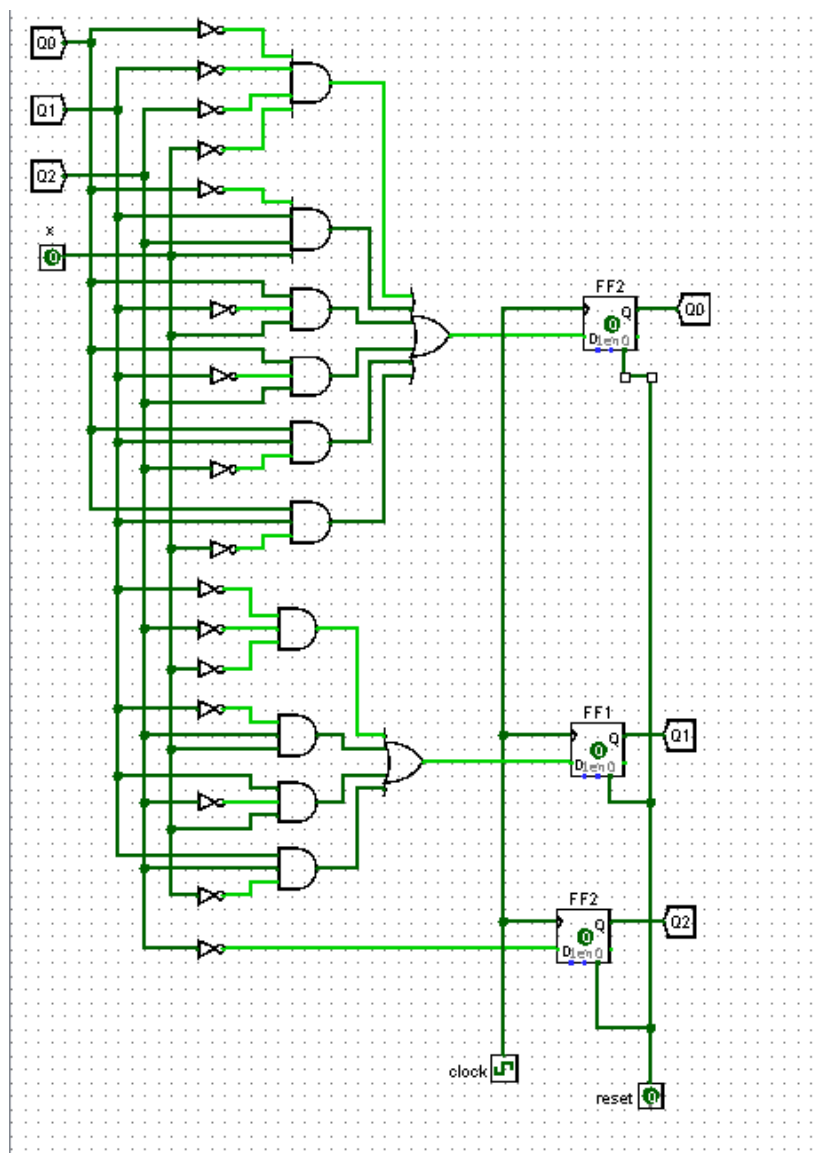


5 Przerzutniki

Dodajemy sygnał zegarowy:



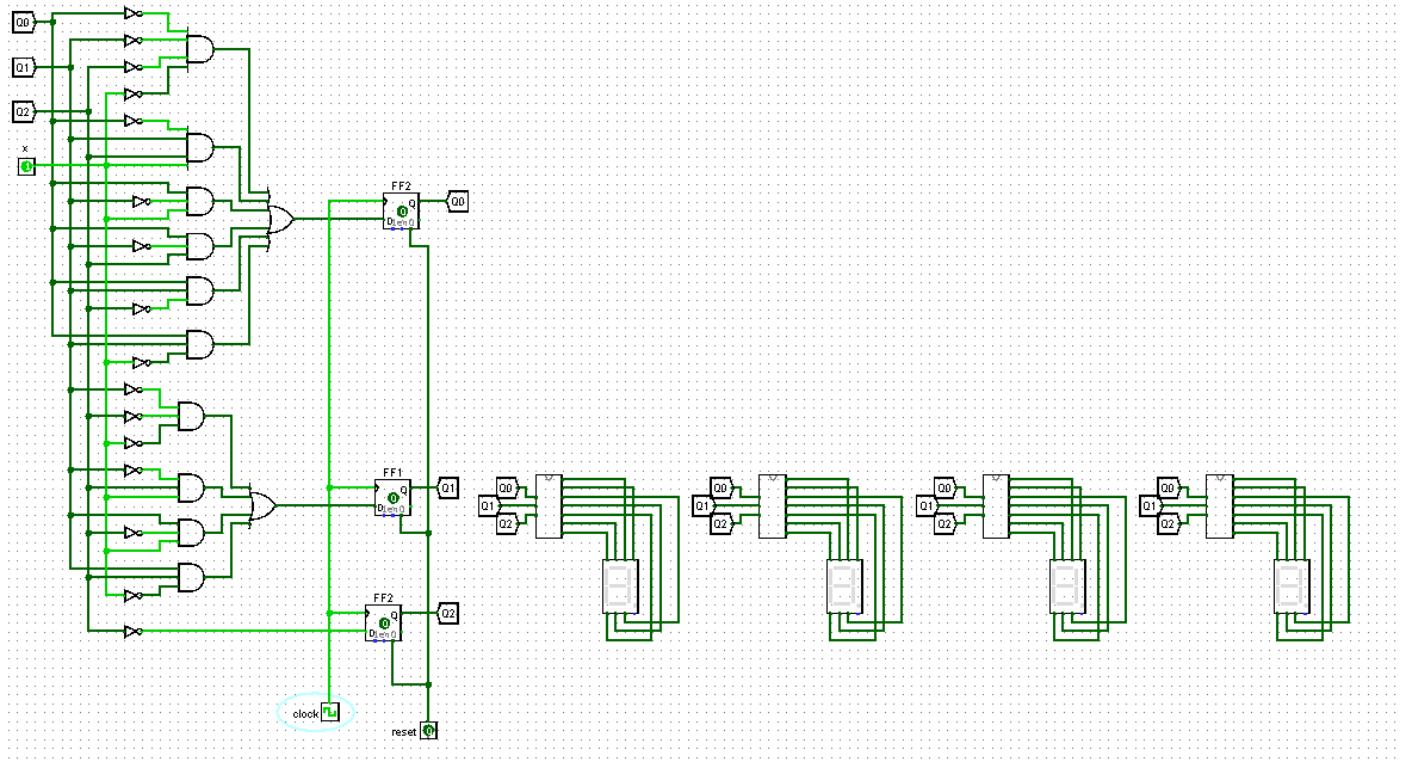
Dodajemy sygnał resetu:



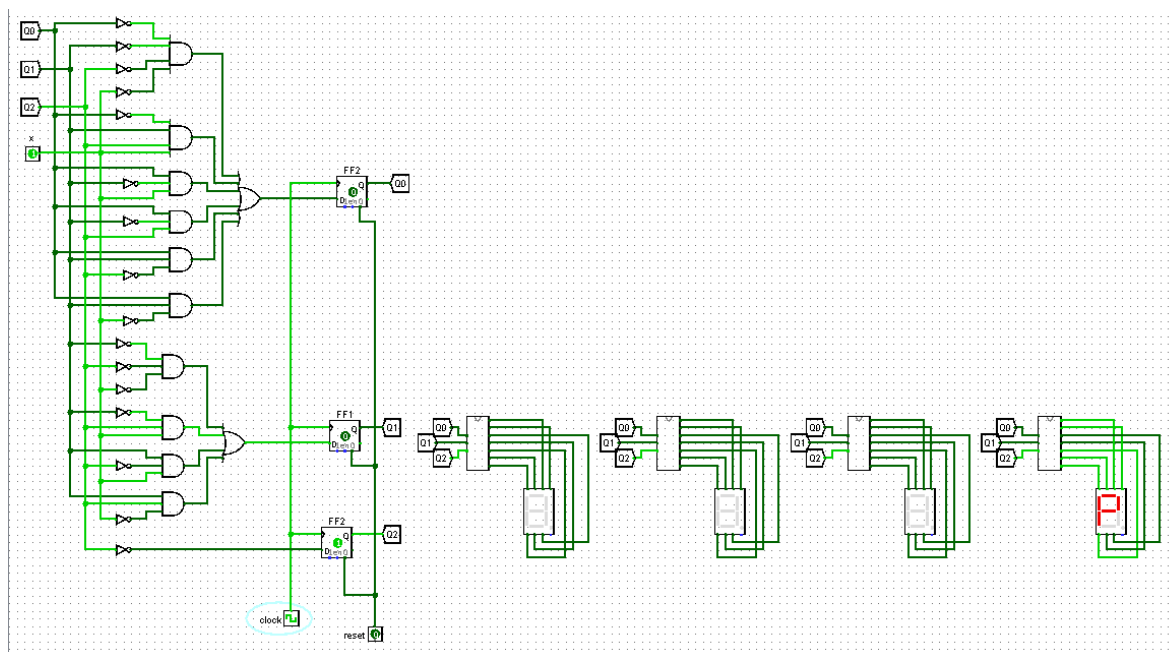
Dodajemy cztery wyświetlacze 7-segmentowe połączone z odpowiednimi funkcjami zmieniającymi numer stanu na litery i przeprowadzamy testy.

6 Testy

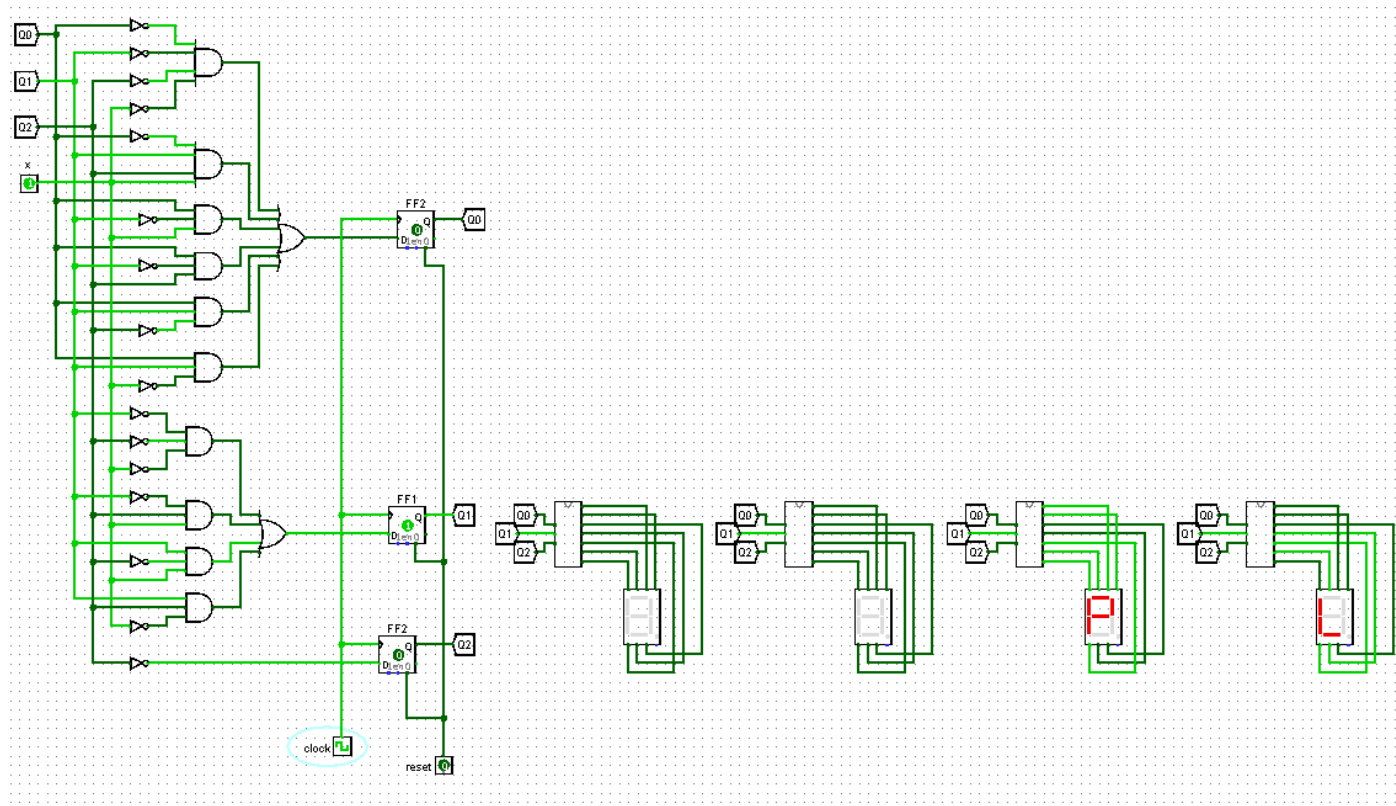
Stan 0



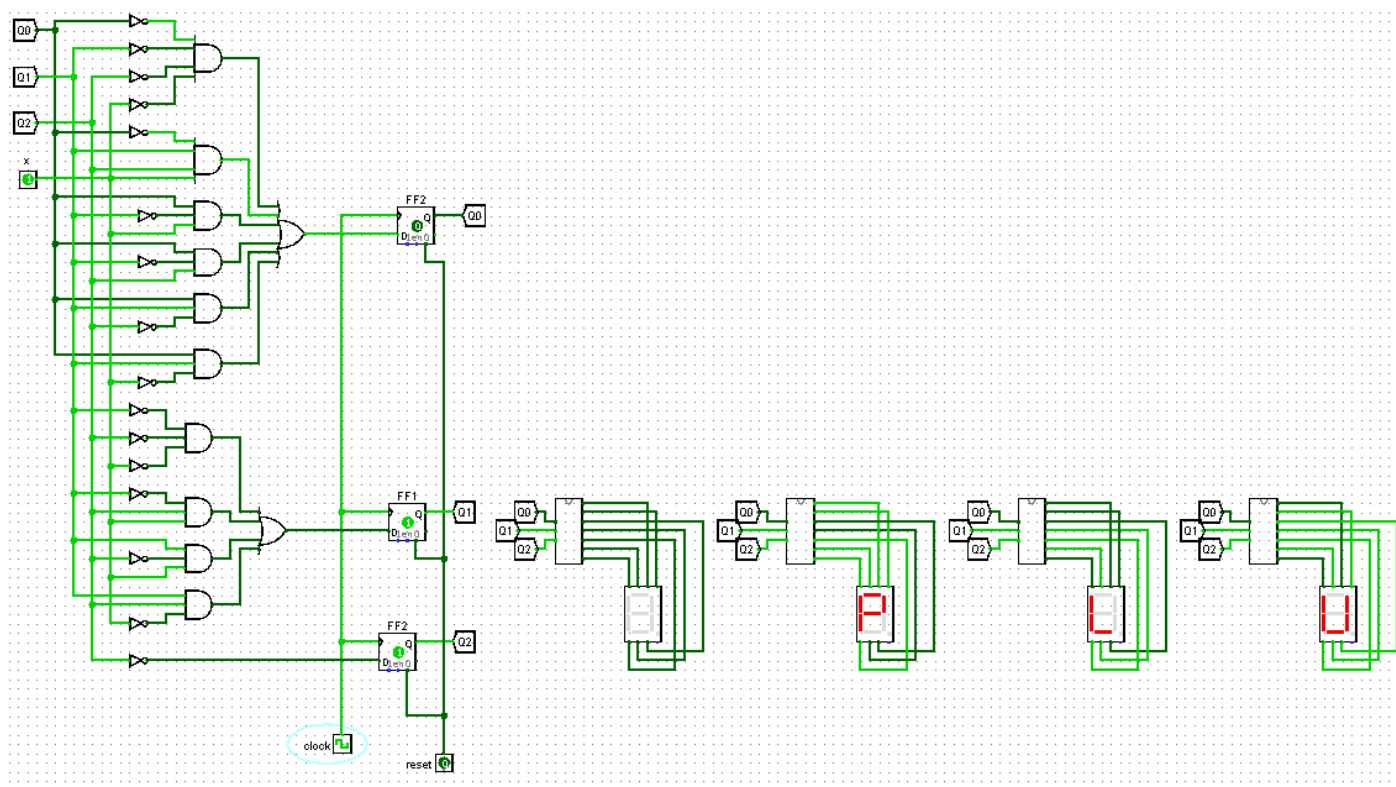
Stan 1



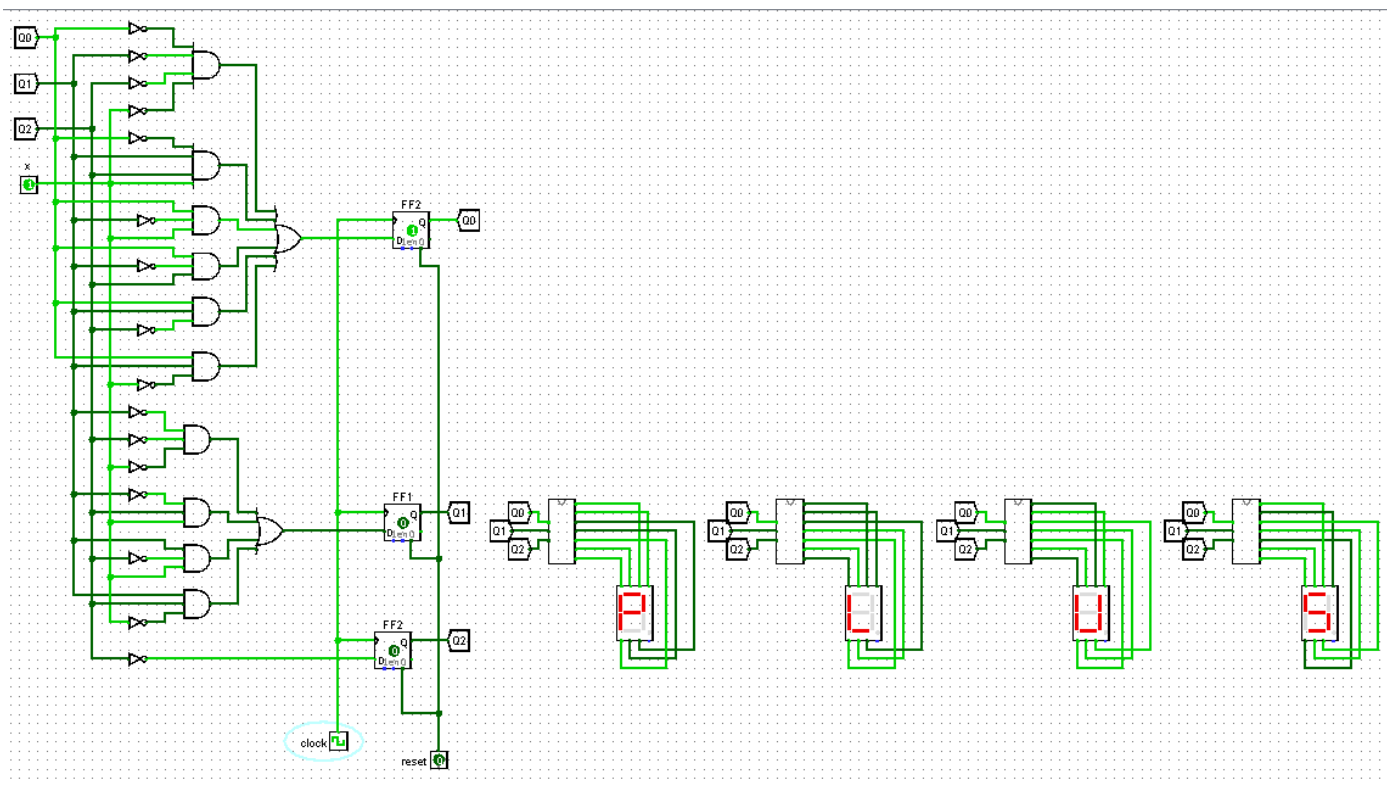
Stan 2



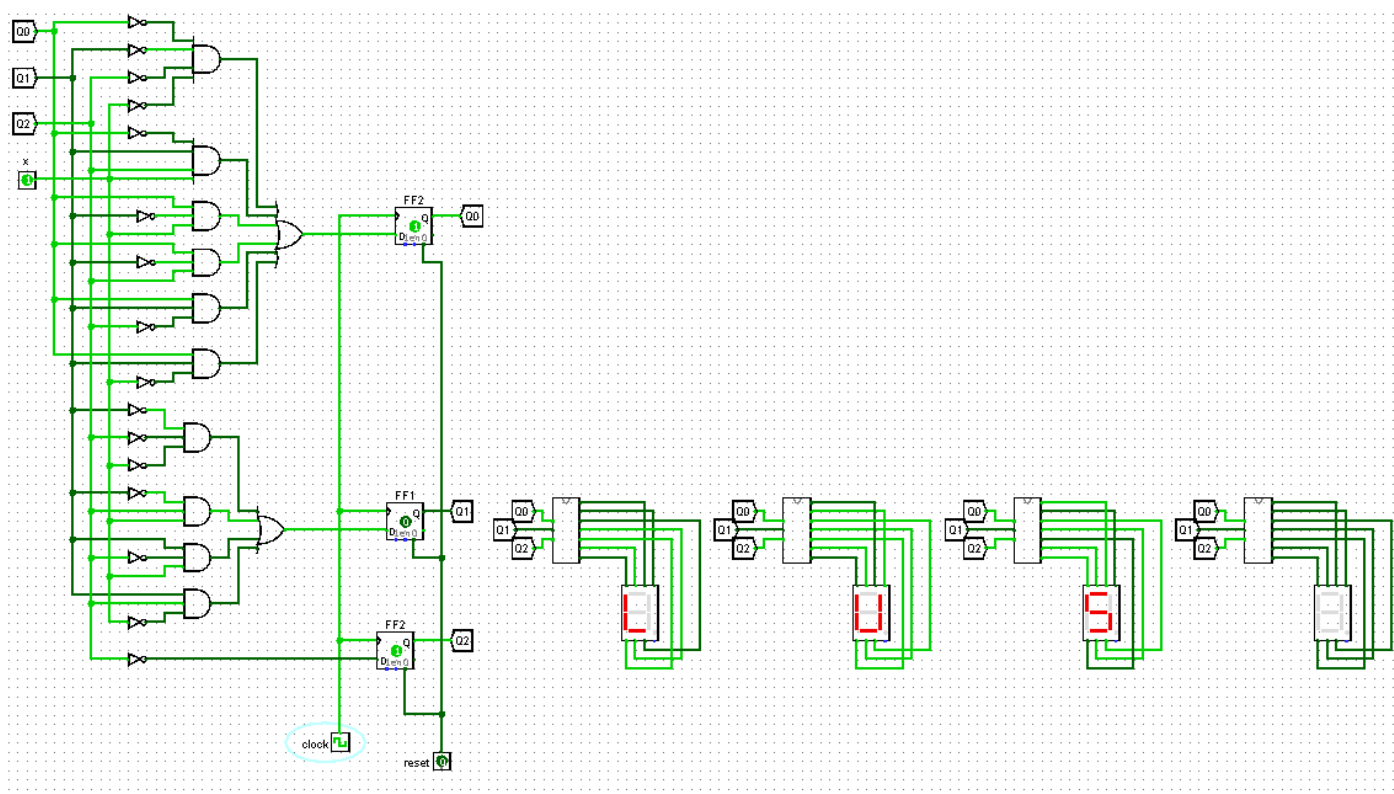
Stan 3

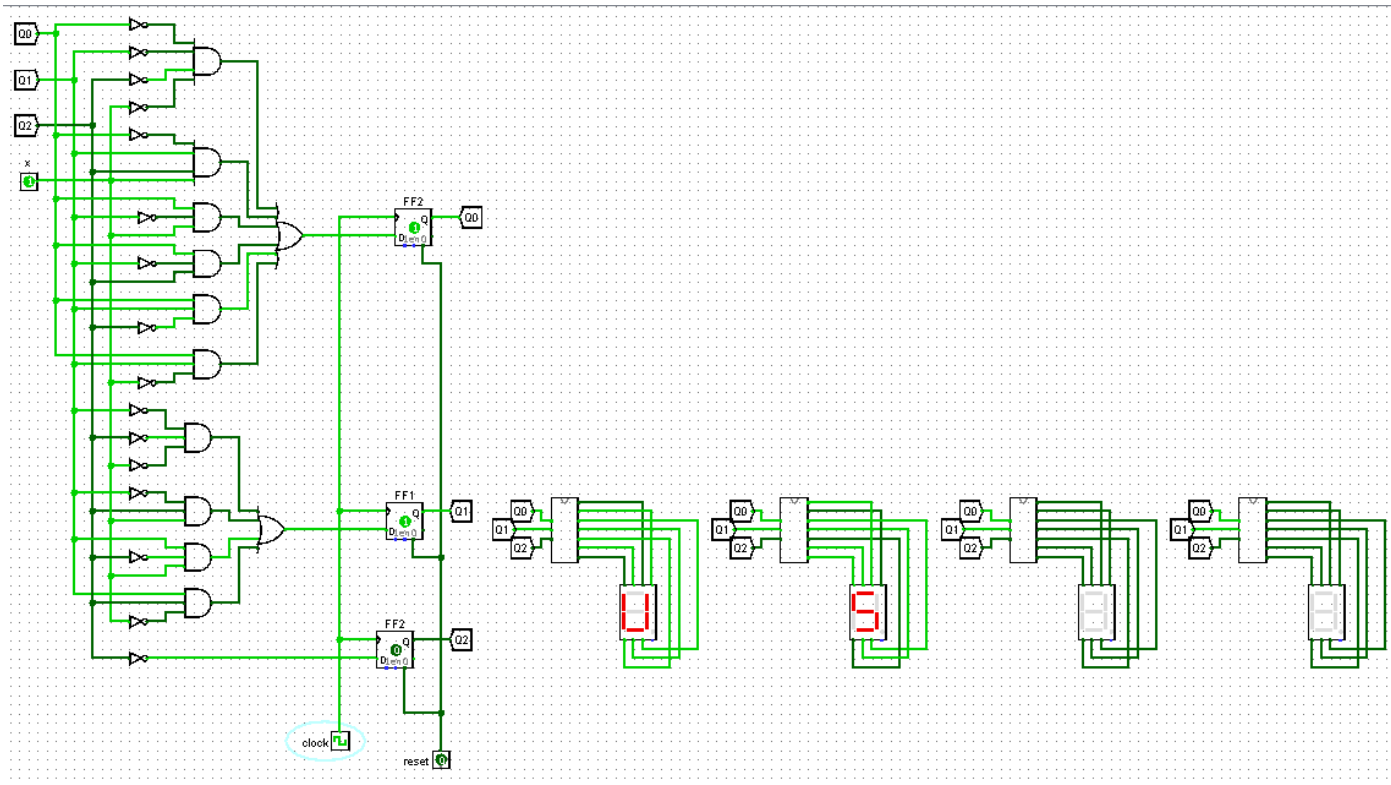


Stan 4



Stan 5





Stan 7

