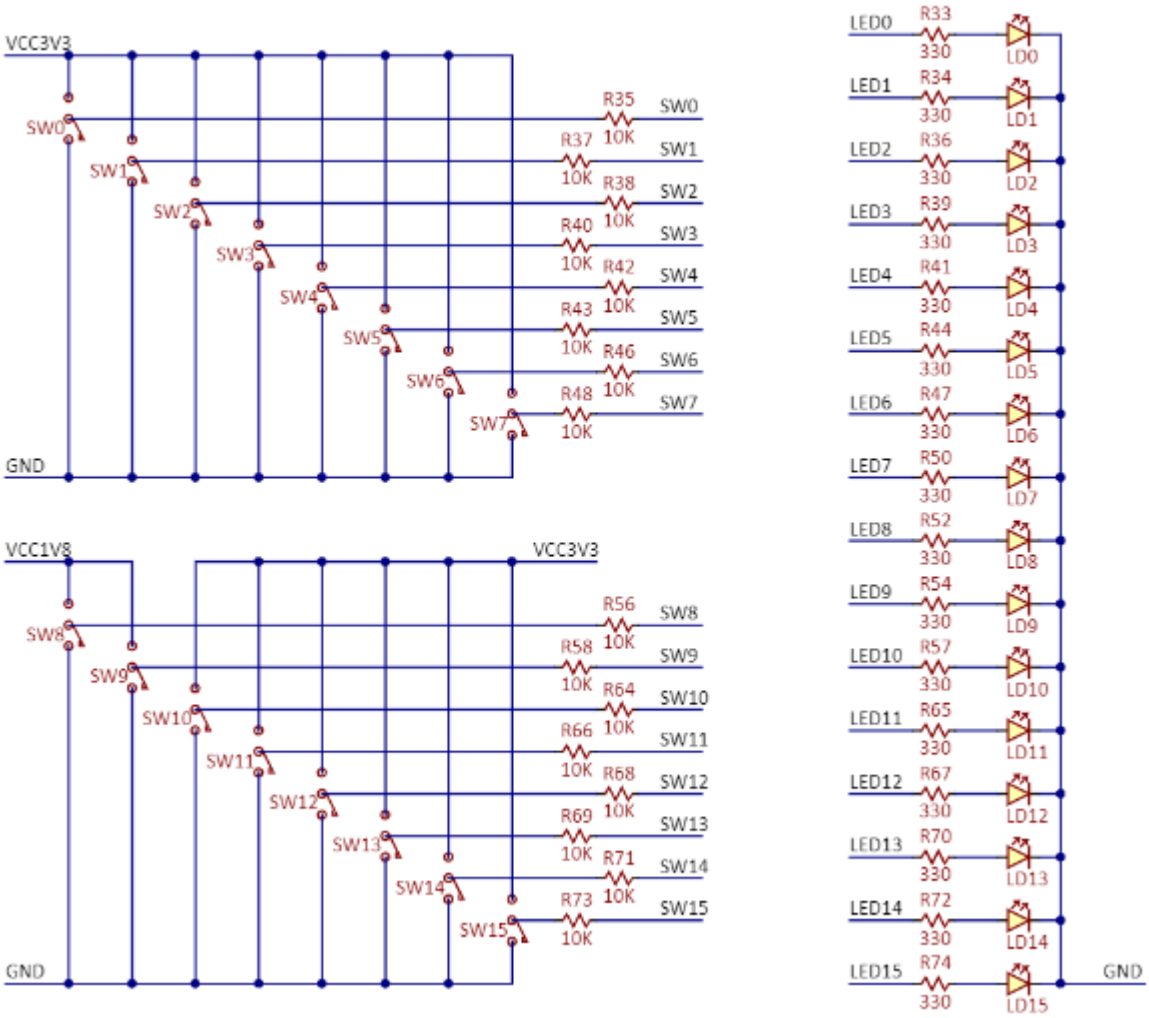
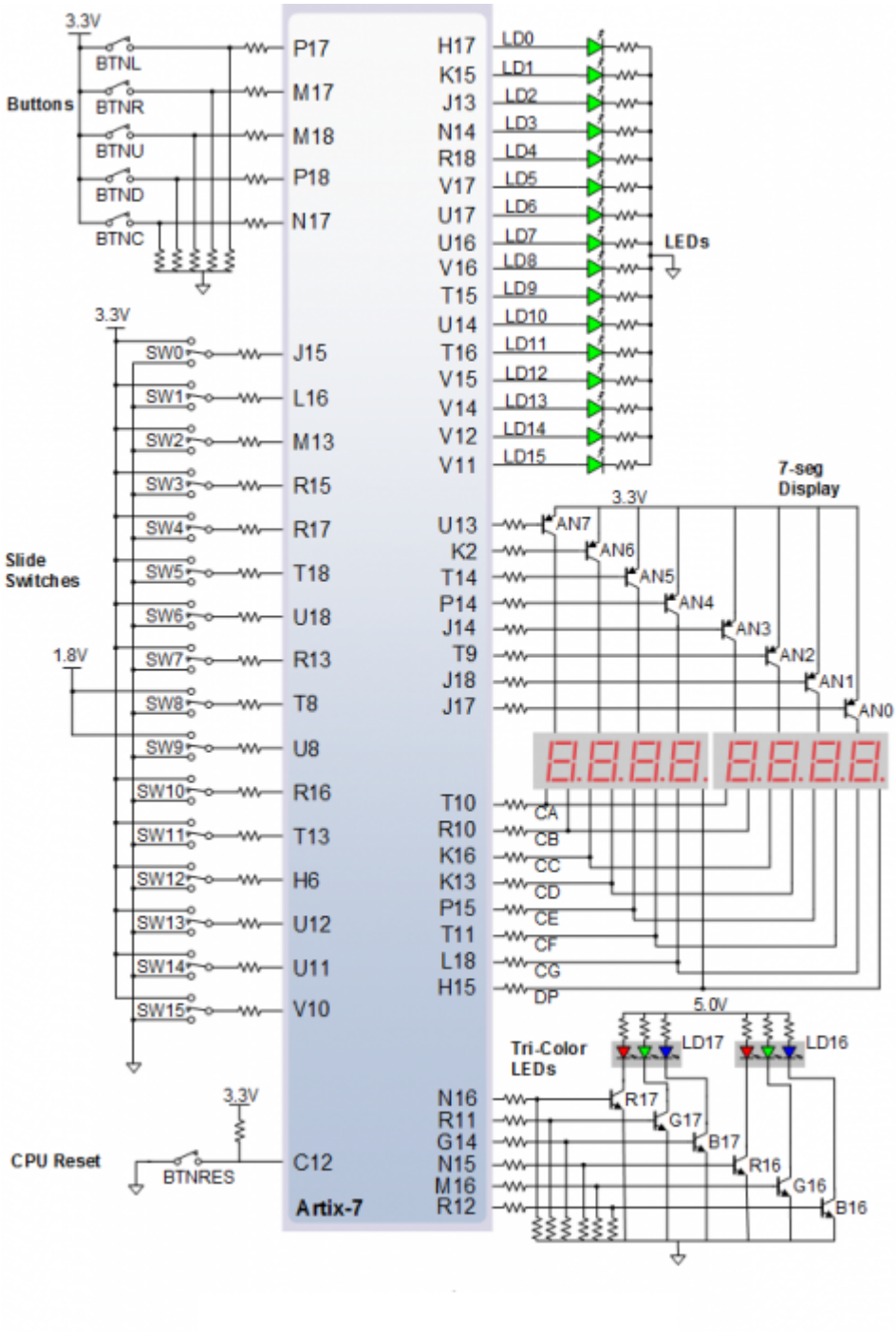
Labs 03-vivado

1) Obrázky a tabulky se zapojeními


VCC3V3
SW0
SW1
SW2
SW3
SW4
SW5
SW6
SW7
GND
R35 10K
R37 10K
R38 10K
R40 10K
R42 10K
R43 10K
R46 10K
R48 10K
SW0
SW1
SW2
SW3
SW4
SW5
SW6
SW7
VCC1V8
VCC3V3
SW8
SW9
SW10
SW11
SW12
SW13
SW14
SW15
GND
R56 10K
R58 10K
R64 10K
R66 10K
R68 10K
R69 10K
R71 10K
R73 10K
SW8
SW9
SW10
SW11
SW12
SW13
SW14
SW15
LED0
LED1
LED2
LED3
LED4
LED5
LED6
LED7
LED8
LED9
LED10
LED11
LED12
LED13
LED14
LED15
R33 330
R34 330
R36 330
R39 330
R41 330
R44 330
R47 330
R50 330
R52 330
R54 330
R57 330
R65 330
R67 330
R70 330
R72 330
R74 330
LD0
LD1
LD2
LD3
LD4
LD5
LD6
LD7
LD8
LD9
LD10
LD11
LD12
LD13
LD14
LD15
GND



Switches

Switches	Resistors (10kΩ)	Connections
SW0	R35	J15
SW1	R37	L16
SW2	R38	M13
SW3	R40	R15

Switches	Resistors (10kΩ)	Connections
SW4	R42	R17
SW5	R43	T18
SW6	R46	U18
SW7	R48	R13
SW8	R56	T8
SW9	R58	U8
SW10	R64	R16
SW11	R66	T13
SW12	R68	H6
SW13	R69	U12
SW14	R71	U11
SW15	R73	V10

LEDs

Leds	Resistors (330Ω)	Connections
LED0	R33	H17
LED1	R34	K15
LED2	R36	J13
LED3	R39	N14
LED4	R41	R18
LED5	R44	V17
LED6	R47	U17
LED7	R50	U16
LED8	R52	V16
LED9	R54	T15

Leds	Resistors (330Ω)	Connections
LED10	R57	U14
LED11	R65	T16
LED12	R67	V15
LED13	R70	V14
LED14	R72	V12
LED15	R74	V11

2) Dvoubitový široký multiplexer 4 na 1

a) Výpis architektury VHDL ze zdrojového souboru

```
architecture Behavioral of mux_2bit_4to1 is
begin

    f_o <= a_i when (sel_i = "00") else
           b_i when (sel_i = "01") else
           c_i when (sel_i = "10") else
           d_i;


    -- WRITE "GREATER" AND "EQUALS" ASSIGNMENTS HERE


end architecture Behavioral;
```

b) Výpis stimulačního procesu VHDL ze souboru testbench

```
       p_stimulus : process
    begin
        -- Report a note at the beginning of stimulus process
        report "Stimulus process started" severity note;


        -- First test values
        s_d <= "00"; s_c <= "00"; s_b <= "00"; s_a <= "00";
        s_sel <= "00"; wait for 10 ns;

        s_d <= "10"; s_c <= "01"; s_b <= "01"; s_a <= "00";
        s_sel <= "00"; wait for 10 ns;
```

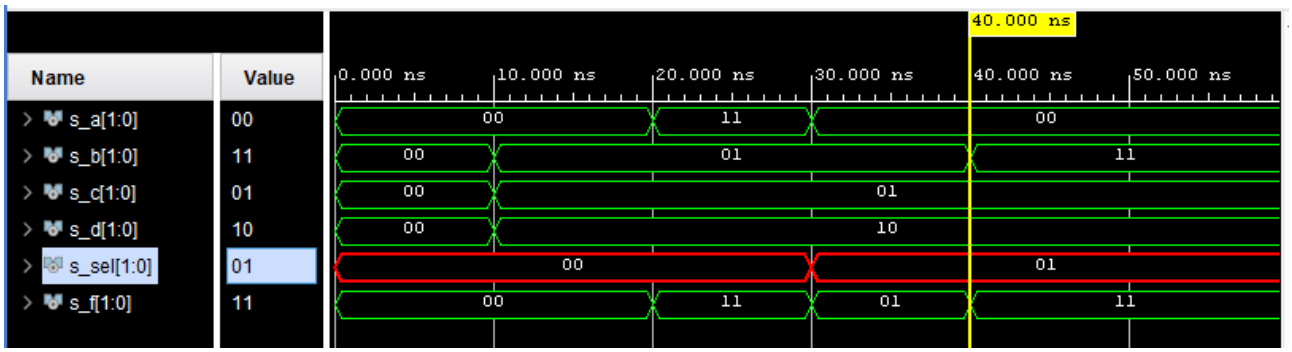
```
        s_d <= "10"; s_c <= "01"; s_b <= "01"; s_a <= "11";
        s_sel <= "00"; wait for 10 ns;

        s_d <= "10"; s_c <= "01"; s_b <= "01"; s_a <= "00";
        s_sel <= "01"; wait for 10 ns;

        s_d <= "10"; s_c <= "01"; s_b <= "11"; s_a <= "00";
        s_sel <= "01"; wait for 10 ns;

        -- Report a note at the end of stimulus process
        report "Stimulus process finished" severity note;
        wait;
    end process p_stimulus;
```

c) Screenshot se simulovanými časovými průběhy



3) Výukový program Vivado (návod na základy Vivada)

(https://github.com/david3891/Digital-electronics-1/blob/main/Labs/03-vivado/n%C3%A1vod_vivado.pdf)