Project BICT-stopwatches

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Main goals of our project

- Counting to 99,99s
- After 99,99s owerflow back to 00,00.
- Starting and stopping with first button(lately changed to switcher)
- Reset with second button
- Turning on one LED after each 99,99s cycle and overflow back to 00,00s
- Get a lot of experiences

Used modules

- Top- top layer of the project
- Bcd_cnt- counting on display
- Bin_cnt_mux- Binary counting
- Disp_mux- display
- Clknasetiny- convert clock signal to 100Hz(0,01s)
- Startastop- module for define use of start and stop button
- Hex_to_sseg- 16bit to display
- On_of_four – choose one of four signals

0 after 9 solution

- After 9(1001) will come 0(0000), otherwise update of the register
- Up to 9 the register will be updated

```
s_next <= "0000" when (s_reg = "1001")
                 else s_reg + 1;

bcd_o <= s_reg;
carry_o <= '0' when s_reg = "1001" else
                   '1';
```

First Button use

- Process to start stopwatches

```
p_prepinac: process(prepinac)
begin
                if falling_edge(prepinac) then
                        s_pom <= s_next;
        end if;
        end process;
```

- Updating register value

```
setiny_o <= setiny_i when( prepinac ='0') else
                                        '0';

  s_next <= '0' when (s_pom = '1') else
                                        '1';
```

Reset with second button

- We used asynchronous reset.

```
p_bcd_cnt: process(reset, clk_i)
begin
        if reset = '0' then
                s_reg <= (others => '0');
        elsif rising_edge(clk_i) then
                s_reg <= s_next;
        end if;
end process p_bcd_cnt;
```

- We used reset for all 4 bcd_cnt

```
reset => btn_i(0)
```

Counting almost to infinity with stopwatches

- Turning on one LED after each 99,99s cycle.
- Depends on usable LEDs
- Usable in counting up to high numbers with an accuracy of hundredths of a second.

Results

- Seven-segment displays are counting up to 99,99.
- Value on display goes back to 00,00 after overflow 99,99.
- Value on display is reset by the reset button.
- Problem with start button(only stop button was working properly)=>the clk_i didn´t started counting after pressing a button or second state on switcher
- Gained great experience during working on our project.

Thanks for your attention and good luck!