

Übung 10, Aufgabe 2

Reaktionszeit-Spiel fuer zwei Personen

Simon Offenberger S2410306027@fhooe.at

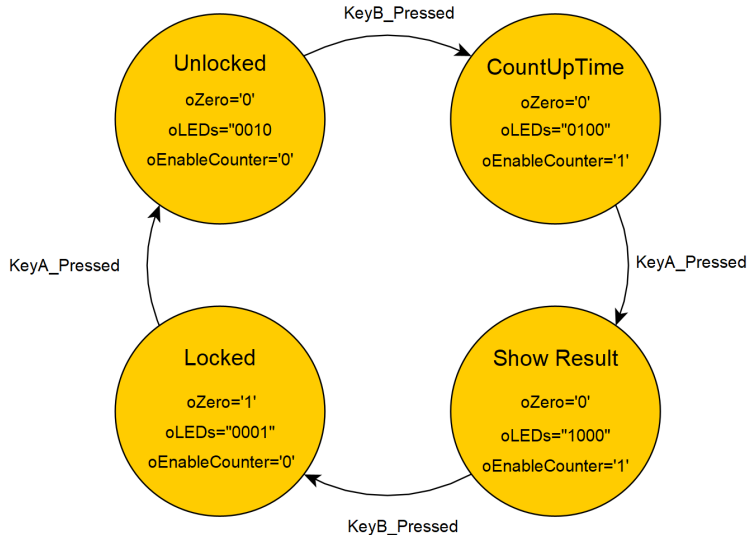
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FH Hagenberg

Agenda

- Decoupling - Spannungsstabilisierung
- GPIO - Schutzbeschaltung
- IR-Emitter
- Spannungsversorgung

Finite State Machine Moore



State Register

```
1  -- State Register
2  process (iClk, inResetAsync) is
3  begin
4      if (inResetAsync = not('1')) then
5          State <= Locked;
6      elsif (rising_edge(iClk)) then
7          if(iEnable = '0') then
8              State <= State; -- hold state when not enabled
9          else
10             State <= NextState;
11         end if;
12     end if;
13 end process;
```

Next State Logic

```
1  -- State Transition Process
2  NextStateLogic : process (State,iEnable,iA_Sync,iB_Sync) is
3  begin
4
5      NextState <= State;    -- default hold state
6      oLeds <= cLEDOFF;      -- default all leds off
7      oZero <= '0';          -- default zero off
8      oEnableCounter <= '0'; -- default counter disabled
9
10     case State is
11     when Locked =>
12         if(iA_Sync = '1') then
13             NextState <= Unlocked;
14         end if;
15         oZero <= '1';          -- reset counters
16         oLeds(cLED_LOCKED_INDEX) <= '1'; -- indicate locked
17                                     state
18     when Unlocked =>
19         if(iB_Sync = '1') then
20             NextState <= CountUpTime;
21         end if;
22         oLeds(cLED_UNLOCKED_INDEX) <= '1'; -- indicate locked
23                                     state
```

```
1  when CountUpTime =>
2      oEnableCounter <= '1'; -- enable counter
3      if(iA_Sync = '1') then
4          NextState <= ShowResult;
5      end if;
6      oLeds(cLED_COUNTUP_INDEX) <= '1'; -- indicate locked
7                                     state
8  when ShowResult =>
9      if(iB_Sync = '1') then
10         NextState <= Locked;
11     end if;
12     oLeds(cLED_SHOWRESULT_INDEX) <= '1'; -- indicate locked
13                                     state
14  when others =>
15     NextState <= cStateAllOff;
16  end case;
17
18 end process;
```

Fragen?