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-- Company:  
-- Engineer:  
--  
-- Create Date: 21.03.2023 07:27:34  
-- Design Name:  
-- Module Name: rubicTB - structural  
-- Project Name:  
-- Target Devices:  
-- Tool Versions:  
-- Description:  
--  
-- Dependencies:  
--  
-- Revision:  
-- Revision 0.01 - File Created  
-- Additional Comments:  
--  
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```

```
library IEEE;  
use IEEE.STD_LOGIC_1164.ALL;  
use ieee.NUMERIC_STD.ALL;  
use ieee.std_logic_unsigned.all;  
use std.env.finish;
```

```
entity rubicTB is  
-- Port ( );  
end rubicTB;
```

architecture structural of rubicTB is

```
constant dw: integer:=2;
```

```
constant ds: integer:=2;
```

```
constant dcs: integer:=3;
```

```
constant dms:integer:=1;
```

```
signal A,B,C,D,E,F:std_logic_vector(dw downto 0);
```

```
signal
```

```
ss111,ss112,ss113,ss121,ss122,ss123,ss131,ss132,ss133:std_logic_vector(dcs downto 0);
```

```
signal
```

```
ss211,ss212,ss213,ss221,ss222,ss223,ss231,ss232,ss233:std_logic_vector(dcs downto 0);
```

```
signal
```

```
ss311,ss312,ss313,ss321,ss322,ss323,ss331,ss332,ss333:std_logic_vector(dcs downto 0);
```

```
signal
```

```
ss411,ss412,ss413,ss421,ss422,ss423,ss431,ss432,ss433:std_logic_vector(dcs downto 0);
```

```
signal
```

```
ss511,ss512,ss513,ss521,ss522,ss523,ss531,ss532,ss533:std_logic_vector(dcs downto 0);
```

```
signal
```

```
ss611,ss612,ss613,ss621,ss622,ss623,ss631,ss632,ss633:std_logic_vector(dcs downto 0);
```

```
signal
```

```
SM121,SM122,SM123,SM131,SM132,SM133:std_logic_vector(dms downto 0);
```

```
signal
```

```
SM221,SM222,SM223,SM231,SM232,SM233:std_logic_vector(dms downto 0);
```

```
signal
```

```
SM321,SM322,SM323,SM331,SM332,SM333:std_logic_vector
```

```

(dms downto 0);
signal
SM421, SM422, SM423, SM431, SM432, SM433: std_logic_vector
(dms downto 0);
signal
SM521, SM522, SM523, SM531, SM532, SM533: std_logic_vector
(dms downto 0);
signal
SM621, SM622, SM623, SM631, SM632, SM633: std_logic_vector
(dms downto 0);
signal CU_631, CU_632, CU_633: std_logic_vector(dS
downto 0);
begin

RTB: entity work.Rubic
generic map(dw=>dw, ds=>ds, dcs=>dcs, dms=>dms)
port map(
    A=>A, B=>B, C=>C, D=>D, E=>E, F=>F,

ss111=>SS111, ss112=>SS112, ss113=>SS113, ss121=>SS121,
ss122=>SS122, ss123=>SS123, ss131=>SS131, ss132=>SS132,
ss133=>SS133,

ss211=>SS211, ss212=>SS212, ss213=>SS213, ss221=>SS221,
ss222=>SS222, ss223=>SS223, ss231=>SS231, ss232=>SS232,
ss233=>SS233,

ss311=>SS311, ss312=>SS312, ss313=>SS313, ss321=>SS321,
ss322=>SS322, ss323=>SS323, ss331=>SS331, ss332=>SS332,
ss333=>SS333,

ss411=>SS411, ss412=>SS412, ss413=>SS413, ss421=>SS421,
ss422=>SS422, ss423=>SS423, ss431=>SS431, ss432=>SS432,

```

```
ss433=>SS433,

ss511=>SS511, ss512=>SS512, ss513=>SS513, ss521=>SS521,
ss522=>SS522, ss523=>SS523, ss531=>SS531, ss532=>SS532,
ss533=>SS533,

ss611=>SS611, ss612=>SS612, ss613=>SS613, ss621=>SS621,
ss622=>SS622, ss623=>SS623, ss631=>SS631, ss632=>SS632,
ss633=>SS633,

SM121=>SM121, SM122=>SM122, SM123=>SM123, SM131=>SM131,
SM132=>SM132, SM133=>SM133,

SM221=>SM221, SM222=>SM222, SM223=>SM223, SM231=>SM231,
SM232=>SM232, SM233=>SM233,

SM321=>SM321, SM322=>SM322, SM323=>SM323, SM331=>SM331,
SM332=>SM332, SM333=>SM333,

SM421=>SM421, SM422=>SM422, SM423=>SM423, SM431=>SM431,
SM432=>SM432, SM433=>SM433,

SM521=>SM521, SM522=>SM522, SM523=>SM523, SM531=>SM531,
SM532=>SM532, SM533=>SM533,

SM621=>SM621, SM622=>SM622, SM623=>SM623, SM631=>SM631,
SM632=>SM632, SM633=>SM633,
        CU_631=>CU_631, CU_632=>CU_632, CU_633=>CU_633);

stim: process

BEGIN
```

```
A<="010";B<="011";C<="010";D<="011";E<="010";F<="011"
ss111<="0010";ss112<="0000";ss113<="0111";ss121<="00
01";ss122<="1001";ss123<="1010";ss131<="1100";ss132<
="1011";ss133<="1100";
ss211<="0010";ss212<="0000";ss213<="0111";ss221<="11
00";ss222<="1001";ss223<="0101";ss231<="0110";ss232<
="0100";ss233<="0011";
ss311<="0010";ss312<="0000";ss313<="0111";ss321<="11
01";ss322<="1010";ss323<="1001";ss331<="1111";ss332<
="1110";ss333<="1011";
ss411<="0010";ss412<="0000";ss413<="0111";ss421<="00
11";ss422<="1001";ss423<="0101";ss431<="0110";ss432<
="0111";ss433<="1000";
ss511<="0010";ss512<="0000";ss513<="0111";ss521<="10
10";ss522<="1100";ss523<="0000";ss531<="1010";ss532<
="1101";ss533<="1001";
ss611<="0010";ss612<="0000";ss613<="0111";ss621<="11
00";ss622<="1010";ss623<="1001";ss631<="1100";ss632<
="1000";ss633<="0011";
SM121<="00";SM122<="00";SM123<="00";SM131<="00";SM13
2<="00";SM133<="00";
SM221<="00";SM222<="00";SM223<="00";SM231<="00";SM23
2<="00";SM233<="00";
SM321<="00";SM322<="00";SM323<="00";SM331<="00";SM33
2<="00";SM333<="01";
SM421<="00";SM422<="00";SM423<="00";SM431<="00";SM43
2<="00";SM433<="00";
SM521<="00";SM522<="00";SM523<="00";SM531<="00";SM53
2<="00";SM533<="00";
SM621<="00";SM622<="00";SM623<="00";SM631<="01";SM63
2<="10";SM633<="11";
    WAIT for 100ns;
```

```
        FINISH;  
END PROCESS stim;  
end structural;
```