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library IEEE;
use IEEE.STD_LOGIC_1164.ALL;

entity RAM_slice_16_bit is
    Port ( D_in : in  STD_LOGIC;
          D_out : out STD_LOGIC;
          Bit_sel : in  STD_LOGIC;
          Row_sel : in  STD_LOGIC_VECTOR (15 downto 0);
          RW : in  STD_LOGIC);
end RAM_slice_16_bit;

architecture Behavioral of RAM_slice_16_bit is

--RAM cell
    COMPONENT RAM_cell
    PORT(
        S : IN std_logic;
        B : IN std_logic;
        not_B : IN std_logic;
        C : OUT std_logic;
        not_C : OUT std_logic
    );
    END COMPONENT;

--read logic
    COMPONENT RAM_read_logic
    PORT(
        C : IN std_logic_vector(15 downto 0);
        notC : IN std_logic_vector(15 downto 0);
        Bit_sel : IN std_logic;
        D_out : OUT std_logic
    );
    END COMPONENT;

--write logic
    COMPONENT RAM_write_logic
    PORT(
        RW : IN std_logic;
        Bit_sel : IN std_logic;
        D : IN std_logic;
        B : OUT std_logic;
        notB : OUT std_logic
    );
    END COMPONENT;

--signals
    signal B, notB : STD_LOGIC;
    signal C, notC : STD_LOGIC_VECTOR(15 downto 0);

begin
--port maps
    --read logic
    Inst_RAM_read_logic: RAM_read_logic PORT MAP(
        C => C,
        notC => notC,
        Bit_sel => Bit_sel,
        D_out => D_out
    );

    --write logic
    Inst_RAM_write_logic: RAM_write_logic PORT MAP(
        RW => RW,
        Bit_sel => Bit_sel,
        D => D_in,
        B => B,
        notB => notB
    );

    --RAM cell 0
    RAM_cell_00: RAM_cell PORT MAP(
        S => Row_sel(0),
        B => B,
        not_B => notB,
        C => C(0),
        not_C => notC(0)
    );

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--RAM cell 1
RAM_cell_01: RAM_cell PORT MAP(
    S => Row_sel(1),
    B => B,
    not_B => notB,
    C => C(1),
    not_C => notC(1)
);

--RAM cell 2
RAM_cell_02: RAM_cell PORT MAP(
    S => Row_sel(2),
    B => B,
    not_B => notB,
    C => C(2),
    not_C => notC(2)
);

--RAM cell 3
RAM_cell_03: RAM_cell PORT MAP(
    S => Row_sel(3),
    B => B,
    not_B => notB,
    C => C(3),
    not_C => notC(3)
);

--RAM cell 4
RAM_cell_04: RAM_cell PORT MAP(
    S => Row_sel(4),
    B => B,
    not_B => notB,
    C => C(4),
    not_C => notC(4)
);

--RAM cell 5
RAM_cell_05: RAM_cell PORT MAP(
    S => Row_sel(5),
    B => B,
    not_B => notB,
    C => C(5),
    not_C => notC(5)
);

--RAM cell 6
RAM_cell_06: RAM_cell PORT MAP(
    S => Row_sel(6),
    B => B,
    not_B => notB,
    C => C(6),
    not_C => notC(6)
);

--RAM cell 7
RAM_cell_07: RAM_cell PORT MAP(
    S => Row_sel(7),
    B => B,
    not_B => notB,
    C => C(7),
    not_C => notC(7)
);

--RAM cell 8
RAM_cell_08: RAM_cell PORT MAP(
    S => Row_sel(8),
    B => B,
    not_B => notB,
    C => C(8),
    not_C => notC(8)
);

--RAM cell 9
RAM_cell_09: RAM_cell PORT MAP(
    S => Row_sel(9),
    B => B,
    not_B => notB,

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        C => C(9),
        not_C => notC(9)
    );

--RAM cell 10
RAM_cell_10: RAM_cell PORT MAP(
    S => Row_sel(10),
    B => B,
    not_B => notB,
    C => C(10),
    not_C => notC(10)
);

--RAM cell 11
RAM_cell_11: RAM_cell PORT MAP(
    S => Row_sel(11),
    B => B,
    not_B => notB,
    C => C(11),
    not_C => notC(11)
);

--RAM cell 12
RAM_cell_12: RAM_cell PORT MAP(
    S => Row_sel(12),
    B => B,
    not_B => notB,
    C => C(12),
    not_C => notC(12)
);

--RAM cell 13
RAM_cell_13: RAM_cell PORT MAP(
    S => Row_sel(13),
    B => B,
    not_B => notB,
    C => C(13),
    not_C => notC(13)
);

--RAM cell 14
RAM_cell_14: RAM_cell PORT MAP(
    S => Row_sel(14),
    B => B,
    not_B => notB,
    C => C(14),
    not_C => notC(14)
);

--RAM cell 15
RAM_cell_15: RAM_cell PORT MAP(
    S => Row_sel(15),
    B => B,
    not_B => notB,
    C => C(15),
    not_C => notC(15)
);

end Behavioral;
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