

VHDL Basics

- VHDL – Selection
 - `when-else`
 - Choose a value when a certain situation exists

```
result_signal <= result_value when decision_signal = decision_value else  
result_value when decision_signal = decision_value else  
result_value when decision_signal = decision_value else  
result_value;
```

Limitation: Only one result signal

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Exhaustive List

```
outA <= "1000" when inA = "00" else  
       "0100" when inA = "01" else  
       "0010" when inA = "10" else  
       "0010" when inA = "11" else  
       "0001";
```

Partial List

```
outA <= "1000" when inA = "00" else  
       "0100" when inA = "01" else  
       "0001";
```

Partially Common Result

```
outA <= "1000" when inA = "00" else  
       "0100" when inA = "01" else  
       "0010" when inA = ("10" or "11") else  
       "0001";
```

Complex Selection

```
outA <= "1000" when (inA or inB) = "00" else  
       "0100" when (inA or inB) = "01" else  
       "0010" when (inA or inB) = "10" else  
       "0001";
```

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```
-----  
--  
-- when_else.vhdl  
--  
-- created 7/5/2018  
-- tj  
--  
-- rev 0  
-----  
--  
-- when-else example  
--  
-----  
--  
-- Inputs: inA, inB, inC  
-- Outputs: outV, outW, outX, outY, outZ  
--  
-----  
library ieee;  
use ieee.std_logic_1164.all;  
  
entity when_else is  
    port (  
        inC:   in std_logic_vector(3 downto 0);  
        outV:  out std_logic_vector(3 downto 0)  
    );  
end entity;
```

architecture behavioral of when_else is

begin

```
    outV <=  "0001" when inC = "0000" else  
            "0010" when inC = "0001" else  
            "0011" when inC = "0010" else  
            "0100" when inC = "0011" else  
            "0101" when inC = "0100" else  
            "0110" when inC = "0101" else  
            "0111" when inC = "0110" else  
            "1000" when inC = "0111" else  
            "1001" when inC = "1000" else  
            "0000";
```

end behavioral;

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