

decoder.vhd

```
-----  
-- Name: Roger Grayson  
-- Date: Feb 6, 2003  
-- Pupr: 5:32 decoder for register file  
-----
```

```
library IEEE;  
use IEEE.std_logic_1164.all;  
entity dec is  
  
    port(    WReg: in std_logic_vector(4 downto 0);  
           WE: in std_logic;  
           DecOut: out std_logic_vector(31 downto 0));  
end entity dec;
```

```
architecture behavior of dec is
```

```
begin
```

```
    process(WE,WReg)
```

```
    begin
```

```
        if (WE='0') then DecOut <= (others => '0');
```

```
        else
```

```
            case WReg is
```

```
                when "00000" => DecOut <= "00000000000000000000000000000001";
```

```
                when "00001" => DecOut <= "00000000000000000000000000000010";
```

```
                when "00010" => DecOut <= "000000000000000000000000000000100";
```

```
                when "00011" => DecOut <= "0000000000000000000000000000001000";
```

```
                when "00100" => DecOut <= "0000000000000000000000000000010000";
```

```
                when "00101" => DecOut <= "00000000000000000000000000000100000";
```

```
                when "00110" => DecOut <= "000000000000000000000000000001000000";
```

```
                when "00111" => DecOut <= "0000000000000000000000000000010000000";
```

```
                when "01000" => DecOut <= "0000000000000000000000000000100000000";
```

```
                when "01001" => DecOut <= "00000000000000000000000000001000000000";
```

```
                when "01010" => DecOut <= "000000000000000000000000000010000000000";
```

```
                when "01011" => DecOut <= "0000000000000000000000000000100000000000";
```

```
                when "01100" => DecOut <= "00000000000000000000000000001000000000000";
```

```
                when "01101" => DecOut <= "000000000000000000000000000010000000000000";
```

```
                when "01110" => DecOut <= "0000000000000000000000000000100000000000000";
```

```
                when "01111" => DecOut <= "00000000000000000000000000001000000000000000";
```

```
                when "10000" => DecOut <= "000000000000000000000000000010000000000000000";
```

```
                when "10001" => DecOut <= "000000000000000000000000000010000000000000000";
```

```
                when "10010" => DecOut <= "000000000000000000000000000010000000000000000";
```

```
                when "10011" => DecOut <= "0000000000000000000000000000100000000000000000";
```

```
                when "10100" => DecOut <= "00000000000000000000000000001000000000000000000";
```

```
                when "10101" => DecOut <= "000000000000000000000000000010000000000000000000";
```

```
                when "10110" => DecOut <= "000000000010000000000000000000000000000000000000";
```

```
                when "10111" => DecOut <= "0000000001000000000000000000000000000000000000000";
```

```
                when "11000" => DecOut <= "00000000100000000000000000000000000000000000000000";
```

```
                when "11001" => DecOut <= "000000010000000000000000000000000000000000000000000";
```

```
                when "11010" => DecOut <= "0000001000000000000000000000000000000000000000000000";
```

```
                when "11011" => DecOut <= "00000100000000000000000000000000000000000000000000000";
```

```
                when "11100" => DecOut <= "0001000000000000000000000000000000000000000000000000000";
```

```
                when "11101" => DecOut <= "00100000000000000000000000000000000000000000000000000000";
```

```
                when "11110" => DecOut <= "010000000000000000000000000000000000000000000000000000000";
```

```
        when "11111" => DecOut <= "10000000000000000000000000000000";
        when others => DecOut <= "00000000000000000000000000000000";
    end case;
end if;
end process;
end behavior;
```