```
entity XXX is
  port (Clock : in  Std_logic;
  Reset : in  Std_logic;
  Enable: in  Std_logic;
  Load  : in  Std_logic;
  Mode  : in  Std_logic;
  Data  : in  Std_logic_vector(7 downto 0);
  X     : out Std_logic_vector(7 downto 0));
end;
```

Enable	Load	Mode	X
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

TASK
Fill in what X is based on the input signals (in the table)

How many FF's are created here?

What type of circuit is this / What does it do?

```
Architecture function_and_select of XXX is
  constant zero_byte: Unsigned(7 downto 0) := "00000000";
  signal Q          : Unsigned(7 downto 0);
  signal ELM        : std_logic_vector(2 downto 0);
  function dec_count(input: Unsigned) return Unsigned is
    constant decade_max : Unsigned(3 downto 0) := "1001";
    constant zero_nibble: Unsigned(3 downto 0) := "0000";
    variable output     : unsigned(input'range);
  begin
    output :=
      input + 1                                when input(3 downto 0) /= decade_max else
      (input(7 downto 4) + 1) & zero_nibble when input(7 downto 4) /= decade_max else
      zero_byte;
    return output;
  end function dec_count;
begin
  ELM <= (Enable & Load & Mode);
  with ELM select Q <=
    dec_count(unsigned(X))  when "011",
    unsigned(X) + 1         when "010",
    unsigned(Data)          when "000" | "001",
    unsigned(X)             when others;
  X <= std_logic_vector(zero_byte) when not reset else std_logic_vector(Q) when rising_edge(Clock);
end;
```