Embedded app of the day....

~~Quad Rotor~~

Oven Controller →

Value $(-1)^S \times (1 + F \times 2^{-23}) \times 2^{(E - 127)}$

Where   S = Sign (+ or −, meaning 0 or 1)

E = Exponent 8 bits ⇐

⤶ base (bias)

F = Mantissa 23 bit actual value

range 0 to $2^{24} - 1$ range   0 to $2^{23} - 1$
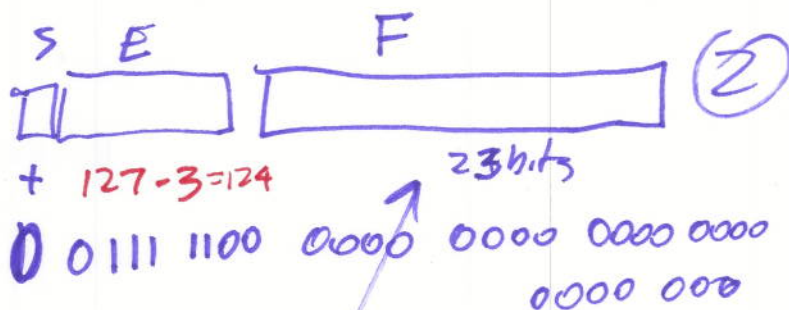   0 16,777,216   0 to   8,388,607

$1111 = 15_{10}$

$1111.1 = 15.5_{10}$

$1111.01 = 15.25_{10}$

$1111.001 = 15.125_{10}$

$0.001 = 0.125_{10}$

$0.001_2 = 1.000_2 \times 2^{\circled{3}}$

$1111.001_2 = 1.111001_2 \times 2^{\circled{3}}$

0.001_2 $\xrightarrow[\text{Single Precision}]{\text{32-bit FP}}$

S   E   F   ②

$+$ $127-3=124$ 23 bits

0 $0111\ 1100$ $0000\ 0000\ 0000\ 0000$
                                    $0000\ 000$

① $\underline{1}.000 \times 2^{-3}$

Assumed to be one

$-0.125_{10} = 1.000_2 \times 2^{-3} = 1\ 01111100\ 000 \longrightarrow$
                                    binary FP
                                    IEEE 754

$15.125_{10} = 1111.001_2 = ① \underline{1}.111001_2 \times 2^3$

Assumed to be 1

S   E   F

□   E   23 bits

$+$ $127+3=130$

0 $1000\ 0010$ $1110\ 0100\ 0000 \cdots \dashrightarrow$
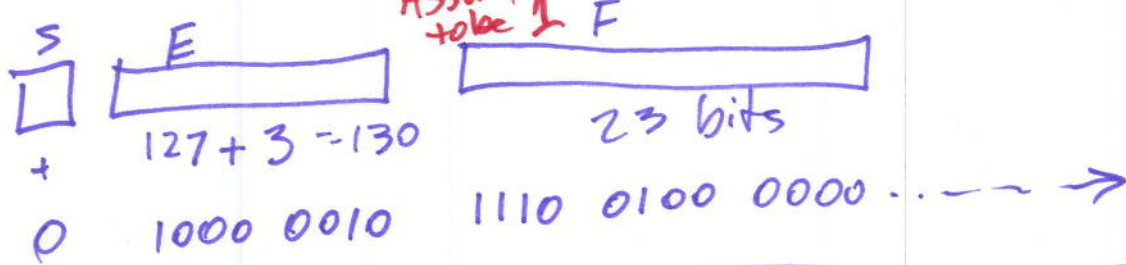
$-64.625_{10} \longrightarrow$ FP Single Precision
                            IEEE 754
                            binary

$-\ 1000000.101_2 =$

$-\ ①.000000\ 101 \times 2^6$

Assume to be 1

S   E   F

□ $127+6=133$

1 $1000\ 0101$ $0000\ 0010\ 1000 \ldots\ldots$
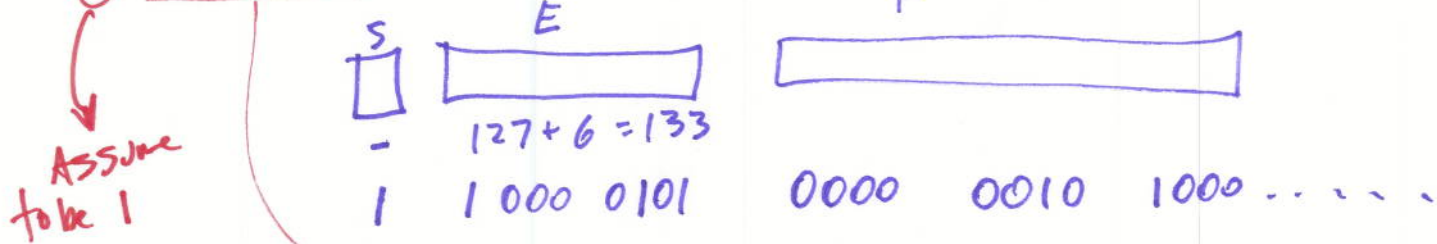
Clocks

External Bus Clock
BCLK $\longrightarrow$ 100 MHz

SDRAM Clock
~~SDRAM~~ SDCLK $\longrightarrow$ 50 MHz

Serial Clock $\longrightarrow$ Set this
AD Clock $\longrightarrow$ Set this

Pipe line
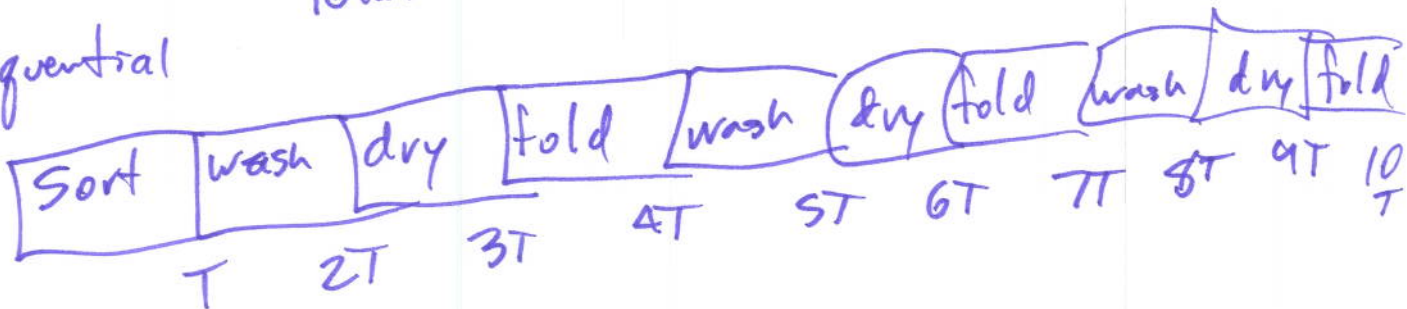
Laundry
sort
washer
dryer
~~fold~~ fold
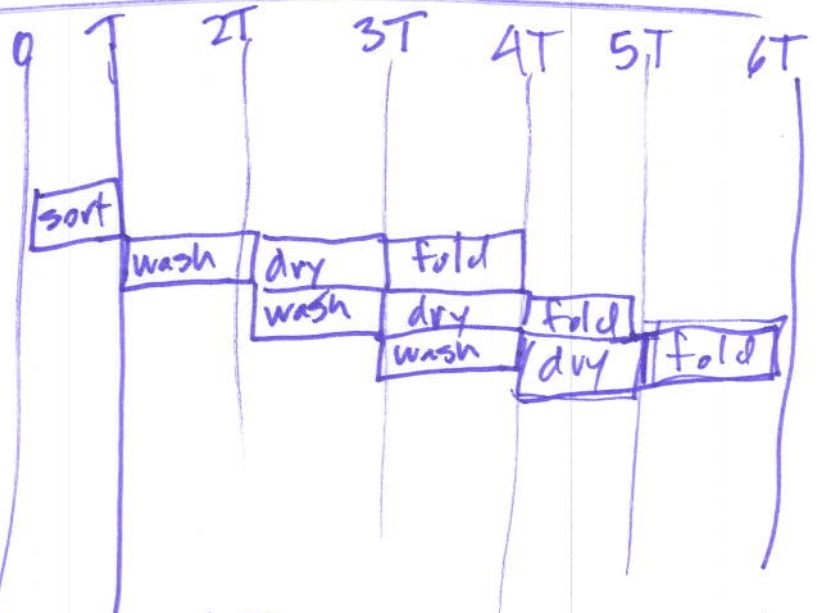
Total Time = 6T

Sequential

Switch (x) {

    Case 3: ⸻ ;
             break;

    Case 4: ⸻ ;
             break;

    Otherwise: ⸻ ;

}

) Put the Case where is true the highest % of time first
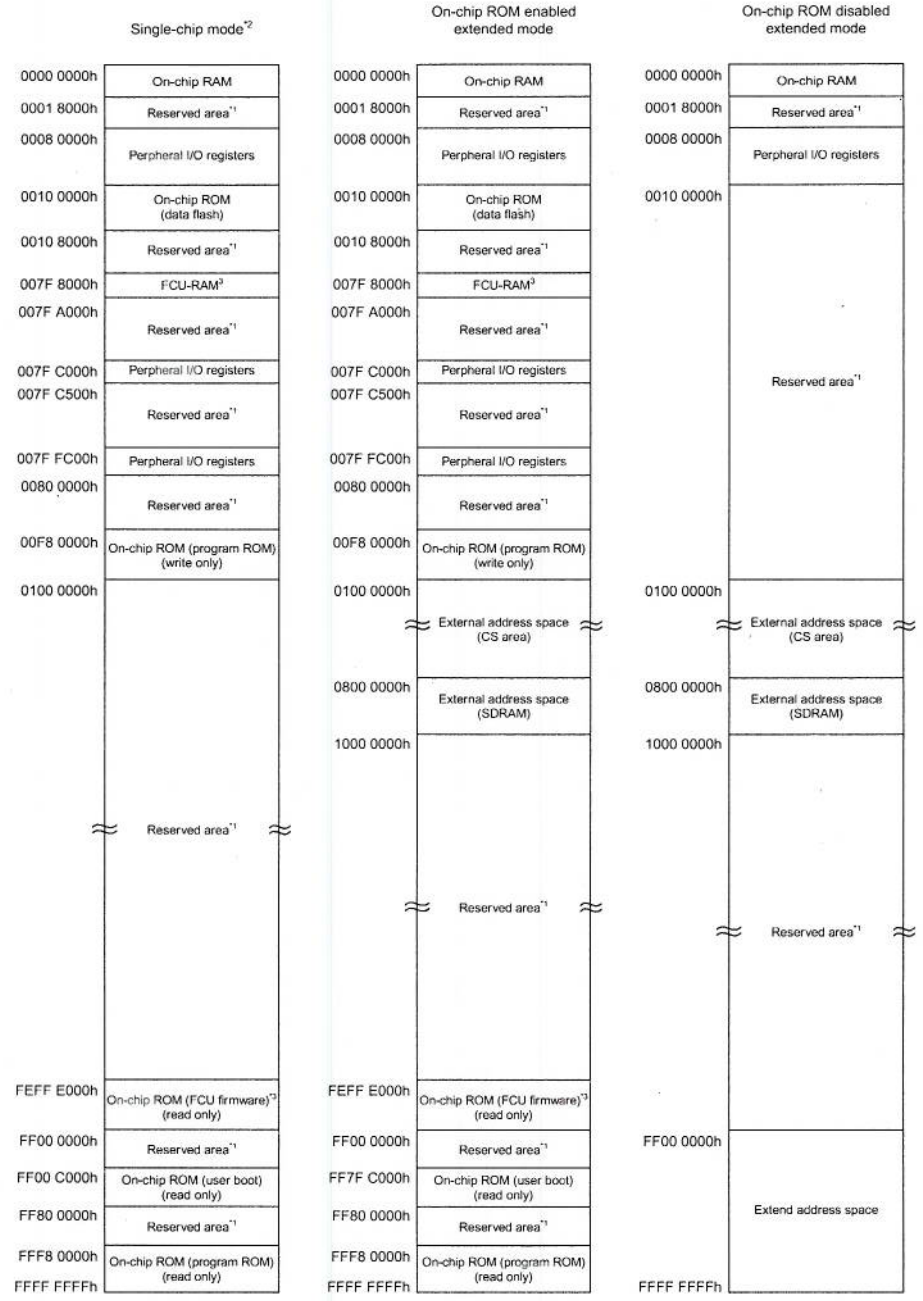
ECGR 4101/5101   Lecture 8

Ⓢ

Figure 3.31 Memory map in each operating mode. Source: *Hardware Manual,* Figure 4.1, page 4–1.