

## ① Unsigned Addition

$$\begin{array}{r}
 93_{10} \quad \begin{array}{ccccccc} & 1 & 1 & 1 & 1 & & \\ 0 & 1 & 0 & 1 & 1 & 1 & 0 \end{array} 1_2 \quad 5D_H \\
 + 122_{10} \quad + \begin{array}{ccccccc} & 0 & 1 & 1 & 1 & 1 & 0 \end{array} 1_2 \quad + 7A_H \\
 \hline
 215_{10} \quad \begin{array}{ccccccc} & 1 & 1 & 0 & 1 & 0 & 1 \end{array} 1_2 \quad D7_H
 \end{array}$$

## ② Signed Subtraction

$$\begin{array}{r}
 B3_H \quad \begin{array}{ccccccc} & 1 & 0 & 1 & 1 & 0 & 0 \end{array} 1_2 \quad \begin{array}{ccccccc} & 1 & 0 & 1 & 1 & 0 & 0 \end{array} 1_2 \\
 - E8_H - (11101000_2) \quad + \begin{array}{ccccccc} & 0 & 0 & 0 & 1 & 1 & 0 & 0 \end{array} 0_2 \\
 \hline
 CB_H \quad \begin{array}{ccccccc} & 1 & 1 & 0 & 0 & 1 & 0 & 1 \end{array} 1_2
 \end{array}$$

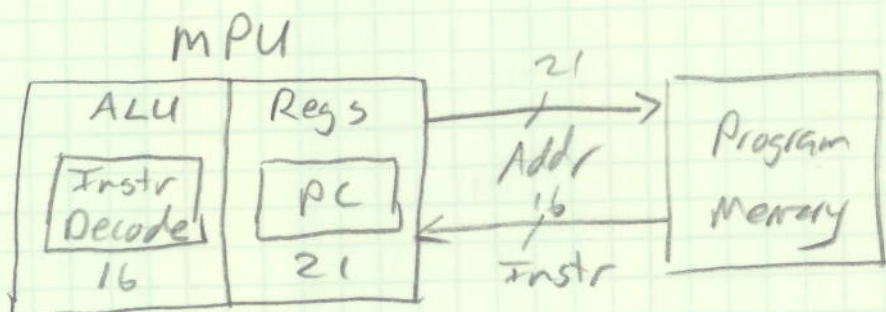
Verify

$$\begin{aligned}
 B3_H &= -(01001101_2) = -(4D_H) = -77_{10} \\
 -E8_H &= 00011000_2 = +18_H = +24_{10} \\
 CB_H &= -(00110101) = -35_H = -53_{10} \checkmark
 \end{aligned}$$

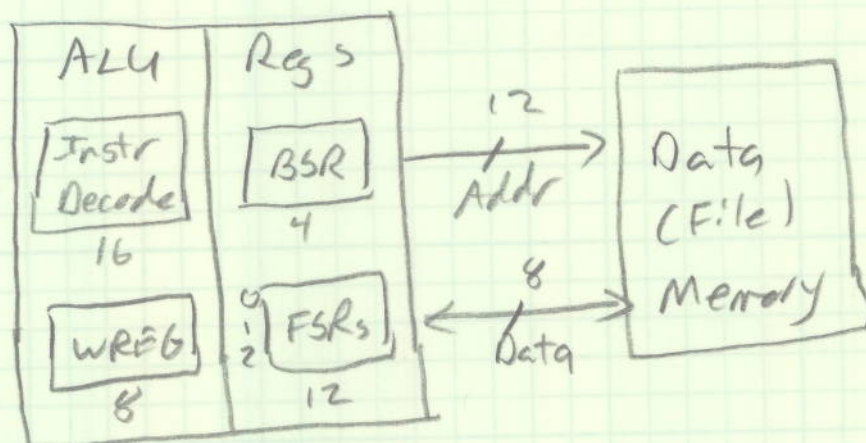
$$③ \text{ 22-bit Address } \Rightarrow 2^{22} = 2^2 \cdot 2^{20} = \underline{\underline{4 \text{ MB}}}$$

$$256K = 2^8 \cdot 2^{10} = 2^{18} \Rightarrow \underline{\underline{18\text{-bit Address}}}$$

(4)



(5)



(6). SFRs are the internal registers used for I/O and support devices

• Address range is  $F80_H$  to  $FFF_H$  is the last bank of Data Memory.