

2022150221 何泽锋

1. 1)  $P_1: \frac{3\text{GHz}}{1.5}$      $P_2: \frac{2.5\text{GHz}}{1.0}$      $P_3: \frac{4\text{GHz}}{2.2}$

$\therefore P_2 > P_1 > P_3$ ,  $P_2$  处理器性能最高.

2) 时钟周期数:  $P_1: 3 \times 10^{10}$      $P_2: 2.5 \times 10^{10}$      $P_3: 4 \times 10^{10}$

指令数:  $P_1: 2 \times 10^{10}$      $P_2: 2.5 \times 10^{10}$      $P_3: 1.82 \times 10^{10}$

3) CPU 运行时间 =  $\frac{\text{指令数} \times \text{CPI}}{\text{时钟频率}}$

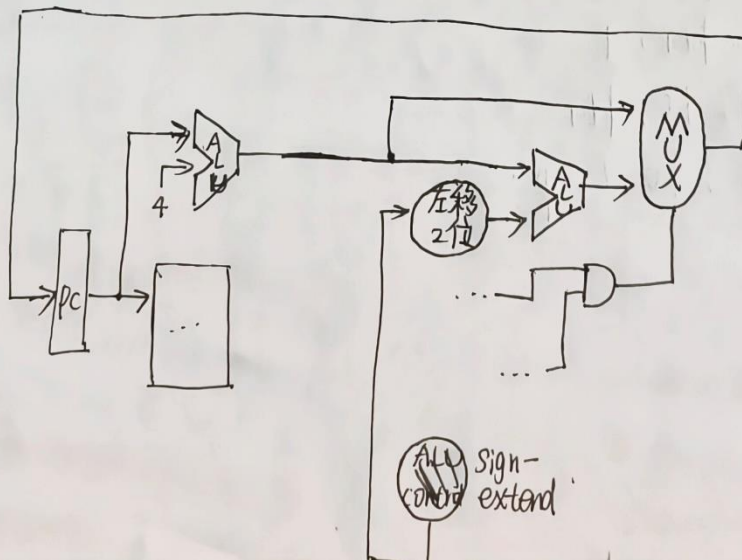
$\therefore t = \frac{I \times \text{CPI}}{f}$

$\frac{t_1}{t_2} = \frac{0.7}{1} = \frac{\frac{I \times 1.2 \text{CPI}}{f_1}}{\frac{I \times 1.2 \text{CPI}}{f_2}} = \frac{1.2 f_2}{f_1}$

$\therefore f_1 = \frac{1.2 f_2}{0.7}$

代入可得  $P_1: 5.14\text{GHz}$   
 $P_2: 4.29\text{GHz}$   
 $P_3: 6.86\text{GHz}$

2.



3. ~~01000~~ ~~01001~~  
 register 1 01001 (9)  
 register 2 10010 (18)  
 data 2 20

4.

	R-format	lw	sw	beq
op 5	0	1	1	0
op 4	0	0	0	0
op 3	0	0	1	0
op 2	0	0	0	1
op 1	0	1	1	0
op 0	0	1	1	0
RegDst	1	0	X	X
ALUSrc	0	1	1	0
MemtoReg	0	1	X	X
RegWrite	1	1	0	0
MemRead	0	1	0	0
MemWrite	0	0	1	0

5. int i=0;  
 for (i=0; i<100; i++){  
   result += MemArray[i];  
 }.

6. add \$t2, \$0, \$0  
 Loop: addi \$t2, \$t2, 2  
       addi \$t1, \$t1, -1  
       slt \$t3, \$0, \$t1  
       bne \$t3, \$0, Loop.