**1.3.1**

**CPU Time = (Instruction Count \* CPI) / Clock Rate**

**perf = 1/CPU Time**

* + 1. **1.33 x 10**9
    2. **1.5 x 109**
    3. **1.2 x 109**

**1.3.4**

IPC- Number of instructions / (CPU Time \* Clock rate)

IPC = 1/CPI

IPCP1 = 1.428

IPCP2 = 2.000

**1.4.1**

P2 (Faster) - Calculate number of instructions

- Calculate time

* + 1. 18.65
    2. 10 x 10-4

**1.4.4**

675 nanoseconds (675 x 10-9 sec)

500 \* 1

stores 50 \* 5

loads 100 \* 5

branches 50 \* 2

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1350 x 10-9

**1.10.2**

**\*\* Uses equation 8 \*\***

**2560 1280\*4 256\*2**

**---- + ------- + -------- = 4096 microseconds**

**2 GHz 2 GHz 2 GHz 4096 x 10-9 seconds**

**2GHz = 2x109 For 2 processors: 4096 / 2**

**1.14.1**

**perf = 1/CPU time**

**106 instructions**

* + - * 1. 0.3125 x 10-3
        2. **0.25 x 10-3**

**P2 is faster by performance**

**1.14.3**

**MIPS= Clock Rate / CPI \* 106 *p. 53***

**P2 is faster by performance**

**1.15.1**

**7 seconds**

**--------- = 3.5% 35 - .2(35) = DO?SOMETHING?INSANE?**

**200**

**2.1.1**

**add f, g, h**

**add f, f, i**

**add f, f, g**

**2.1.4**

**f = g + h;**

**2.4.1**

**add $s0, $s1, $s2 #$s0**

**lw $s1, 16(s7) #comment**

**add $so, $so, $s1 #comment**

**2.4.3**

**4 registers**

**2.5.4**

**Hexidecimal → Decimal**

**0x12345678 → 305,419,896**

**2.6.1**

**f = -g + h + B[1]; f = $s0 / g = $s1**

**h = $s2 / i = $s3**

**sub $s0, $s2, $s1 #j = $s4**

**lw $s2, 4($s7) #A = $s6**

**add $s0, $s0, $s2 #B = $s7**

**2.6.4**

**f = f + g**

**f = i + h**

**f = i + h**

**f = 2i + h**

**2.6.6**

| type | opcode | rs | rt | rd | immediate |
| --- | --- | --- | --- | --- | --- |
| R | 0 | 16 | 17 | 16 | -- |
| R | 0 | 19 | 18 | 16 | -- |
| R | 0 | 16 | 19 | 16 | -- |

**2.7.1**

**BINARY → DECIMAL**

**A. 10101101000100000000000000000010 → 2, 903, 506, 946**

**2.7.3**

**ad100002**

**2.7.5 & 2.7.6**