Connor Osborne

CS2810 Homework 2

1.5

a.

P2 has a higher performance with 2.5 x 10^9

b.

P1: cycles = 30 x 10^9

Instructions = 20 x 10^9

P2: cycles = 25 x 10^9

Instructions = 25 x 10^9

P3: cycles = 40 x 10^9

Instructions = 18.18 x 10^9

c. need a 71% increase in clock rate

1.6

P2 is faster

1. CPI for P1 = 2.6

CPI for P2 = 2

1. P1= 2.6 x 10^6

P2 = 2 x 10^6

1.8

1.8.1

Pentium 4 Prescott: 16nF

Core i5 Ivy Bridge: 14.52nF

1.8.2

Pentium 4 Prescott: %of static power = 10%, ratio = .11

Core i5 Ivy Bridge: % of static power42.86%, ratio = .75

1.8.3

Pentium 4 Prescott: 1.18V

Core i5 Ivy Bridge: 0.48V

1.10

1.10.1

Wafer 1 yield: 0.959

Wafer 2 yield: 0.909

1.10.2

Cost per die for wafer 1: 0.149

Cost per die for wafer 2: 0.165

1.10.3

Wafer 1: Die area = 1.9125 cm^2, Yield = 0.957

Wafer 2: Die area = 2.8559 cm^2, Yield = 0.905

1.10.4

Old version: 0.0426 defects/cm^2

New version: 0.0259 defects/cm^2

2.1

sub $t0, $s2,5

add $s0, $s1, $t0

2.2

f = g + h + i

2.3

sub $s5, $s3, $s4

sll $s5, $s5, 2

add $t0, $s6, $s5

lw $t0, 0($t0)

sw $t0, 32($s7)

2.4

B[g x 4] = A[(f x 4) + 4]