

## Chapter 4

4.7

4.7.1

700ps

4.7.2

950ps

4.7.3

905ps

4.7.4

705ps

4.7.5

700ps

4.7.6

950ps

4.16

4.16.1

350 ps. and 1250 ps.

4.16.2

1750 ps. and 1250 ps.

4.16.3

ID and 300 ps.

4.16.4

35%

4.16.5

65%

4.22

4.22.1

**sw** \$s5, 12(\$s3) IF ID EX ME WB

**lw** \$s5, 8(\$s3) IF ID EX ME WB

**sub** \$s4, \$s2, \$s1 IF ID EX ME WB

**bez** \$s4, label \*\*\* \* IF ID EX ME WB

**add** \$s2, \$s0, \$s1 IF ID EX ME WB

**sub** \$s2, \$s6, \$s1 IF ID EX ME WB

4.27

4.27.1

```
add $s3, $s1, $s0
nop
nop
lw $s2, 4($s3)
lw $s1, 0($s4)
nop
or $s2, $s3, $s2
nop
nop
sw $s2, 0($s3)
```

4.28

4.28.1

The CPI increases from 1 to 1.4125.

4.28.2

The CPI increases from 1 to 1.3375.

4.28.3

The CPI increases from 1 to 1.1125.

4.28.4

The speedup is approximately 1.019.

4.28.5

The “speedup” is 0.91.

4.28.6

The predictor is 25% accurate on the remaining branches.

4.29

4.29.1

Always Taken=60%

Always not-taken=40%

4.29.2

25%

4.29.3

60%