Christopher Martin, Jennifer Wolfe, Geoffrey Corey
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CS 472 HW 5

Chapter 9 Homework Questions

(9.2) **Why do computers use cache memory?**

To increase performance.

(9.3)

Temporal Locality - addresses that are accessed over and over again within a short time span.
Spacial Locality - addresses that are clustered within the same region of memory.

(9.4)

(9.5)

t_m = 70ns, t_c = 7ns, h = 0.9 S = 5.3

t_m = 60ns, t_c = 3ns, h = 0.8 S = 6.9

t_m = 60ns, t_c = 3ns, h = 0.8 S= 4.2

t_m = 60ns, t_c = 3ns, h = 0.97 S = 7.2

(9.6)

t_m = 60ns, t_c = 3ns, S = 1.1 h = 0.09

t_m = 60ns, t_c = 3ns, S = 2.0 h = 0.52

t_m = 60ns, t_c = 3ns, S = 5.0 h = 0.84

t_m = 60ns, t_c = 3ns, S = 15.0 h = 0.98

(9.8) **Calculate the maximum speed-up ratio you could expect to see as h approaches 100%.**

(9.11) **In a direct mapped cache memory system, what is the meaning of the following terms: Word, Line, Set.**

Word: 16-bit or 32-bit, Line: made up of individual words, Set: Units of lines.

(9.12)

(9.17)

(9.22)

(9.23)

(9.26)

(9.28)

(9.35)

(9.41)

(9.42)

(9.43)

(9.45) **A compute runs an instruction set with the with characteristics in a table. What is the average number of cycles per instruction?**

(9.46)

(9.57)