CPSC 418	Advanced Computer Architecture	Spring 1996

Homework 6: Due 27 Feb

Problem 1 (3 Points) **Segmentation difficulties**

What are the most significant disadvantages to segmented memory systems and what causes these disadvantages?

Problem 2 (3 Points) **Physical address calculation**

Use a picture and (words and/or pseudo-code) to describe how segmented memory systems translate virtual addresses to physical addresses.

Problem 3 (2 Points) **Resource requirements**

What hardware resources and software functionality are required in a segmented memory system?

Problem 4 (3 Points) **Brainiac vs Speed-demon**

4(a) (1 Points) How can a "Brainiac" running at one-third the clock speed of a "Speed-demon" achieve similar performance?

4(b) (2 Points) Is the Intel P6 (Pentium Pro) a Speed Demon or a Brainiac? *Justify your answer.*

Problem 5 (8 Points) **AXP-21164 / Power2 comparison**

5(a) (4 Points) List four significant *instruction set architecture* differences between the DEC Alpha and IBM Power2.

5(b) (2 Points) Describe one effect that the ISA differences have on the micro-architectures of the AXP-21164 and RS/6000; be sure to explain why the ISA has this effect.

5(c) (2 Points) Describe one effect that the ISA differences have on compilers for the AXP-21164 and RS/6000, be sure to explain why the ISA has this effect.

Problem 6 (1 Points)

How much time did you spend total on the assignment and on each of these problems? Which problems were useful or useless? How well did the lectures and text book prepare you for this homework? Which concepts needed better explanation?