Tutorial Week 5

8.2 Consider a system in which a program can be separated into two parts: code and data. The CPU knows whether it wants an instruction (instruction fetch) or data (data fetch or store). Therefore, two base–limit register pairs are provided: one for instructions and one for data. The instruction base–limit register pair is automatically read-only, so programs can be shared among different users.

Discuss the advantages and disadvantages of this scheme.

8.4 Consider a logical address space of 64 pages of 1024 words each, mapped onto a physical memory of 32 frames.

(a) How many bits are there in the logical address?

(b) How many bits are there in the physical address?

9.8 Consider the following page reference string:

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.

How many page faults would occur for the following replacement algorithms, assuming one, two, three, four, five, six, or seven frames? Remember all frames are initially empty, so your first unique pages will all cost one fault each.

(a) LRU replacement

(b) FIFO replacement

(c) Optimal replacement

The table on the next page may be useful – use one copy per algorithm

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.