MP2 Bonus Report

b09902004 資工二 郭懷元

1. Pros and Cons of Demand Paging

- Lower memory utilization. Unused allocated spaces never take up memory space.
- No external fragmentation. Paging allows noncontiguous physical address to be used.
- Higher / more disk IO for demand paging.
- Works well when physical memory isn't large due to lower memory utilization.
- Sharing page is easy.
- Overhead due to interrupts and memory access time is a lot higher, because page faults happen more frequently.

2. Effective Memory Access Time Analysis

Question 1

Assuming that TLB uses indices to all k levels together as index and frame number as value.

$$\begin{aligned}\text{EMAT} = \quad & P(\text{TLB access time} + \text{memory access time}) \\ & + (1-P)(\text{TLB access time} + (k+1)\text{memory access time})\end{aligned}$$

Where P is TLB hit ratio.

Question 2

$$\begin{aligned}0.8(20+x) + 0.2(20+4\times x) &< 180 \\ x &< 100\end{aligned}$$

Less than 100 nanoseconds