FIT9137 Applied Week 3

Topics:

- Introduction to computer architecture, operating systems main functionalities: memory management, process management, file management

Covered Learning Outcomes:

- Explain the three major functions of an operating system (OS), namely, process management, memory management, and file management;

Instructions:

- One of the main purposes of an applied session is to build the learning community, create connections and include the learners. The other goal is to give and receive feedback from your peers and or your tutors.
- Form groups of 2 students (peers) to work through the exercises. If met a problem, try to solve it by asking direct questions to your peer. If the issue was not solved by peers, ask your tutor. If did not get a chance to solve the problem during your applied session with your peer or tutor, jump into one of many consultation hours and ask any of the tutors to help you. Please visit the "Teaching Team and Unit Resources" tile in the FIT9137 Moodle site.

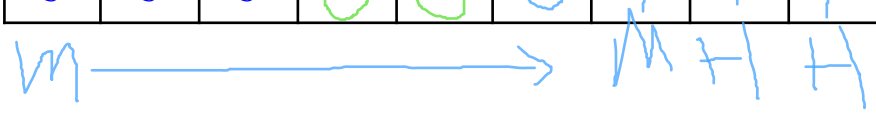
1 Page Replacement Algorithms

In operating systems, we say that a **hard fault** occurs when a running program accesses a memory page that is mapped into the virtual address space, but not loaded in physical memory.

1.1 FIFO

In this task assume you have 3 slots in your memory. Consider a sequence of pages written on top of the below table. Find the number of hard faults if one uses FIFO algorithm to replace pages into memory. We filled the first 3 columns to give initiate the process for you.

3	2	1	0	3	2	4	3	2	1	0	4
		1									
	2	2									
3	3	3									



1.2 LRU

In this task assume you have 3 slots in your memory. Consider a sequence of pages written on top of the below table. Find the number of hard faults if one uses LRU algorithm to replace pages into memory. We filled the first 3 columns to give initiate the process for you.

3	2	1	0	3	2	4	3	2	1	0	4
		1									
	2	2									
3	3	3									

1.3 Increase the number of memory slots

In this task, let us assume we have 4 slots in your memory. Repeat tasks 1.1 and 1.2 and count the number of hard faults. Compare the results and note any counterintuitive outcome. Do a little bit of research on **Bélády's anomaly.**