

8404121 PROCESSOR DESIGN

Exercise based on the software issues lecture

7. Table below represents two linked lists in memory. The header is in address 2000 (hex) and it contains header information of the **command queue** (address 2000) and **free queue** (address 2008). Data records are 4 words (16 bytes) long, aligned to 4-word boundaries (2010, 2020, etc.), and they contain forward (FLINK) and backward (BLINK) links in addition to 8 bytes of data. Links are relative according to the start address of the corresponding record (or header) address. All the numbers are hexadecimal.
- Construct the links for both lists.
 - Remove the first record of the command queue and change the necessary links. What would be the necessary steps in the program to accomplish this?
 - After completing the task in b), place the removed record to the last position in the free queue. What would be the necessary steps in the program to accomplish this?

Free queue		Command queue		
0000 0018	0000 0048	0000 0030	0000 0010	2000
xxxx xxxx	xxxx xxxx	FFFF FFF0	0000 0030	2010
xxxx xxxx	xxxx xxxx	0000 0030	FFFF FFE8	2020
xxxx xxxx	xxxx xxxx	0000 0010	FFFF FFD0	2030
xxxx xxxx	xxxx xxxx	FFFF FFD0	FFFF FFF0	2040
xxxx xxxx	xxxx xxxx	FFFF FFB8	FFFF FFD0	2050
“useful data”		BLINKs	FLINKs	