Worksheet 08 - Memory &File

1. A paged virtual memory has the following characteristics:

   - The virtual address size is 32 bits.
   - The page size is 1024 words.
   - Each word is 1 integer.
   - Each page table entry needs 4 integers.

Solution:

Page size= ___1024__ words

Page size requires ___10__bit for offset (w).

Bits for virtual address = bits for page number +bits for offset

Number of bits required for page number is ____1034____

Page table (PT) can address __16___pages.

Size of page Table= Number of pages that PT can address * size of PT entry.

Size of page table= _64__

2. A process in a paged system accesses the following virtual addresses: 10,104, 73, 309, 185, 245, 434, 458,364

   a. Derive the corresponding reference string if the page size is 100 words, 200 words, and 300 words.

   Use the example given below to answer the rest.
   For address 245

   When page size is 100, reference string is 245/100=**2**
   When page size is 200, reference string is 245/200=**1**
   When page size is 300, reference string is 245/300=**0**

Page size	Reference String								
	10	104	73	309	185	245	434	458	364
100	0	1	0	3	1	2	4	4	3
200	0	0	0	1	0	1	2	2	1
300	0	0	0	1	0	0	1	1	1

3. Physical memory consists of 4-page frames, initially all empty. The following reference string is processed:
   0 1 4 0 2 3 0 1 0 2 3 4 2 3

a. Show which pages are resident under the optimal page replacement algorithm. Indicate when page faults happen.

NO IDEA

a. Show which pages are resident under the FIFO page replacement algorithm. Indicate when page faults happen.

NO IDEA

b. Show which pages are resident under the LRU page replacement algorithm. Indicate when page faults happen.

NO IDEA

4. A portion of the FAT has the following contents:

index	.. .	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	...
Index	.. .	14	—	25	26	27	28	30	35	16	—	—	40	42	18	17	29	...

The FCB of file f1 contains 22 as the first file block.

a. List all blocks belonging to file f1.

22 contains 30

30 contains 17

17 contains NULL where is stops

5. A file system uses a bitmap to keep track of free disk space. One bit represents a 512-byte block.
The disk contains 3 files, A, B, C, with the respective sizes of 1040, 700, 2650 bytes. Later, file B is deleted.

a. Show the bitmap before and after the deletion of file B.

1 bit = 512 byte block.

File B has 700 bytes. 700/512 = 1.36 bits.

file A 1040/512 = 2.03 bits

file c 2650/512 = 5.17 bits

total = 8.56 bits before deletion

after deletion 8.56 - 1.36 = 7.2 bits or 3,386 bit