Operating Systems   Homework 6.

Due Date 17/05/2019

**1-** Assume empty partitions (starting from left to right) in memory are 5k, 2k, 50k, 2k, 1k, 15k.   The memory requests (ordered from left to right) are 1k, 5k, 2k, 12k, 1k, 3k.  Write the empty portions of the memory after allocating the requests with a) Best Fit, b) Next Fit, c) First Fit.

**2-** Consider a simple paging system with 32 bit physical addressing space, 2 kb page size and 24 bit logical addressing space.

a. What is the maximum page number in each process?

b. How many bytes are in a frame?

c. How many bits in the physical address specify the frame number?

d. How many entries are in the page table?

e. How many bits are in each page table entry?

f. How many bytes require for keeping the entire page table?

g. How many bits are required for offset addressing in each page?

h. How many frames are in the memory?

**3-** Using the same system described in question 2, write the binary translation of the logical address 0001010010111011 under the following assumptions and explain your answer:

A. a paging system with a 2 kb byte page size, where in the page table the value of index i is i+2. (the value of index 0 is 2, the value of index 1 is 3 and so on)

B. a segmentation system with a 3KB segment size, using a segment table in which the base of segment i is 4096*i. (for example the base of segment 2 is 8192)

**4-** (Bonus +10) The Fibonacci sequence is defined as follows:   $F_0 = 0$,   $F_1 = 1$,   $F_{n+2} = F_{n+1} + F_n$.

a. Could this sequence be used to establish a buddy system? how?

b. What would be the advantage of this system over the binary buddy system?