1. A memory manager for a variable-sized partition strategy has a free list of blocks of size 600, 1000, 2200, 1600, and 1050 bytes.
2. What block will be selected to honor a request for 1603 bytes using the best-fit policy?
3. What block will be selected to honor a request for 949 bytes using the best-fit policy?
4. What block will be selected to honor a request for 1603 bytes using the worst-fit policy?
5. What block will be selected to honor a request for 349 bytes using the worst-fit policy?
6. Assume the free list is ordered as the blocks are listed in the problem statement. What block will be selected to honor a request for 1603 bytes using the first-fit policy?
7. Assume the free list is ordered as the blocks are listed in the problem statement. What block will be selected to honor a request for 1049 bytes using the first-fit policy?
8. Consider a swapping system in which memory consists of the following hole sizes in

memory order: 10K, 4K, 20K, 15K, and 9K.

Which hole is taken for successive segment requests of: (a) 8K (b) 12K (c) 10K

for first fit, best fit, and worst fit.

3. Consider a swapping system in which memory consists of 500K

as shown below.

+---+-----+------+--------+--------+-----+--+

|xxx| P3 | xxxx | P5 | xxxxxx | P7 |xx|

+---+-----+------+--------+--------+-----+--+

0 50 160 240 320 420 480 500

Note that P3, P5, and P7 are processes in memory. Assume that process P3 was just swapped into memory. Consider each of the four swapping algorithms discussed in class: first fit, next fit, best fit and worst fit, Complete the table showing where each of the processes will be loaded.

Assume that new processes arrive in the order P8, P9, P10, and are of size 50K, 70K, and 45K, respectively.

If a process won't fit, write "out of memory" in the appropriate slot, then indicate if compaction could be used to correct the problem.

4. Consider a logical address space of 64 pages of 1024 words each, mapped onto a physical memory of 32 frames.

a. How many bits are there in the logical address?

b. How many bits are there in the physical address?

5. Given five memory partitions of 100 KB, 500 KB, 200 KB, 300 KB, and 600 KB (in order), how would each of the first-fit, best-fit, and worst-fit algorithms place processes of 212 KB, 417 KB, 112 KB, and 426 KB (in order)?Which algorithm makes the most efficient use of memory?

6. A CPU generates 32-bit virtual addresses. The page size is 4 KB. The processor has a translation look-aside buffer (TLB) which can hold a total of 128 page table entries and is 4-way set associative. The minimum size of the TLB tag is \_\_**15 bits**\_\_\_\_\_\_\_\_

7. Consider a logical address space of 8 pages; each page is 2048 byte long, mapped onto a physical memory of 64 frames.

1. What are the sizes of the logical and physical spaces?
2. How many bits are there in the logical address and how many bits are there in the physical address?
3. A 6284 bytes program is to be loaded in some of the available frames= {10, 8, 40, 25, 3, 15, 56, 18, 12, 35}. Show the contents of the program’s PMT.
4. What is the size of the internal fragment?
5. Convert the following logical addresses 2249, 5245 and 10512 to physical addresses.

8. Consider a logical address space of 8 pages; each page is 2048 byte long, mapped onto a physical memory of 64 frames.

1. What are the sizes of the logical and physical spaces?
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4. What is the size of the internal fragment?
5. Convert the following logical addresses 2249, 5245 and 10512 to physical addresses.
6. Assume a page size of 1KB, the logical address space is 8KB and the physical address space is 16KB. Answer the following questions:
   1. What is the highest degree of parallelism?
   2. What is the length in bits of the physical address field?
   3. What is the length in bits of the logical address field?
   4. What is the length of the Page Table?
7. Assume that the page size is 128 bytes; the current program size is 635 bytes and the physical space 2048 bytes. Before the program is loaded the free frame list is {10, 7, 2, 9, 12, 4, 8, 14}. Answer the following questions after loading the above program in main memory:
   1. What is the internal fragment size?
   2. What is the physical address of 128?
   3. What is the physical address of 635?
   4. What is the logical address of the 2-D physical address <10,120>?