HW8 8.1、8.4、8.6

8.1 Explain the difference between internal and external fragmentation.

Internal fragmentation is the area occupied by a process but cannot be used by the process. This space is unusable by the system until the process release the space.

External fragmentation exists when total free memory is enough for the new process but it's not contiguous and can't satisfy the request.   Storage is fragmented into small holes.

8.4 Most system allow a program to allocate more memory to its address space during execution. Allocation of data in the heap segments of programs is an example of such allocated memory. What is required to support dynamic memory allocation in the following schemes?

a. Contiguous memory allocation:

might require relocation of the entire program since there is not enough space for the program to grow its allocated memory space.

b. Pure segmentation:

might also require relocation of the segment that needs to be extended since there is not enough space for the segment to grow its allocated memory space.

c. Pure paging:

incremental allocation of new pages is possible in this scheme without requiring relocation of the program's address space.

8.6 What is the purpose of paging the page tables?

In certain situations the page tables could become large enough that by paging the page tables, one could simplify the memory allocation problem (by ensuring that everything is allocated as fixed-size pages as opposed to variable-sized chunks) and also enable the swapping of portions of page table that are not currently used.