1. {6 marks} Consider a simple paging system using 12-bit addresses, and the page size is 512 bytes.
   a. How many bits are used for page number, and how many bits are used for offset? Briefly explain how you derive the results.
   b. Compute the logical address of the relative address 700 and 1700, respectively, and briefly explain how you derive the results.
   c. Consider the following process page table, compute the physical address of the relative address 700 and 1700, respectively, and briefly explain how you derive the results.

0	2
1	3
2	6
3	7
4	8

Process Page Table

2. {5 marks} Consider a simple segmentation system that has the following segment table

Starting Address	Length (bytes)
660	248
1752	422
222	200
996	600
1600	150

For each of the following logical address (segment number, offset), determine the physical address or indicate if a segment fault occurs:
   a. 0, 160
   b. 2, 100
   c. 1, 480
   d. 4, 120
   e. 3, 700

3. {9 marks} Consider the typical situation in a multiprogramming environment, in which the OS maintains a queue of requests for each I/O device. If we assume the disk head is initially located at track 75 for a disk with 200 tracks (numbered from 0 to 199). The requested tracks, in order received by the disk scheduler, are 175, 48, 140, 60, 95, 28, 39, and 80.
   a. Using the SSTF scheduling, give the sequence of track access and compute the total number of tracks traversed by the disk arm.
   b. Using the SCAN scheduling with the LOOK refinement, give the sequence of track access and compute the total number of tracks traversed by the disk arm. Assume that the disk arm moves in the direction of decreasing track number at first.
   c. Using the C-SCAN scheduling with the C-LOOK refinement, give the sequence of track access and compute the total number of tracks traversed by the disk arm. Assume that the disk arm moves in the direction of decreasing track number only.

Submission:

- You must submit your answers as a single Word or PDF file named assignment-ID through Blackboard community by the due date, where ID is your student number. Late Submission will not be accepted.
- Your submission must contain a cover page with your name, student number, and section number.
- You must do the assignment individually.
- You may submit your work multiple times, but only the LAST submission before the due will be graded.