Homework #6 – answers

1. (20 points)
    a. SSTF scheduling, the movement of the disk head will follow the sequence: (42)->40->37->27->15->67->90. So the total moving distance is 2+3+10+12+52+23 = 102.
    b. For the SCAN scheduling, the disk head will move (42)->67->90->(99)->40->37->27->15. The total moving distance is 25+23+9+59+3+10+12 = 141.
2. (40 points) If the block size is 1KB, then one block can store 1KB/4B = 256 pointers.
    a. The maximum file size means all the direct pointers, single indirect and double indirect pointers will be used to the maximum content. So it will support 8 (directed blocks) + 256 (single indirect blocks) + 256 * 256 (double indirect blocks) data blocks. In the meanwhile, we can consider 1+256 blocks are used as the overhead (storing the indices).
    b. 1 if N is less than or equal to 8, 2 if N is between 9 and 256+8, 3 if N is between 265 and 8+256+256*256.
    c. For a file size of 1025, it will use two data blocks. So the space used for this files is two data blocks + i-node size
    d. For a file size of 64KB, it will one block for the single indirect pointer, plus the 64 data blocks. So altogether it is 65 data blocks + i-node size.

3. (15 points: 5 points for each) For contiguous allocation, N=1; for linked allocation, N=10; for indexed allocation, N=2