Homework 4

1.

   a)

     SSTF – This algorithm aims to pick the request closest to the current position on the disk as possible. This minimizes seek time and takes rotational delay into consideration.

     SCAN - This algorithm moves in one direction and selects the request closest to the current position, then reverses direction when it reaches the end.

     C-SCAN – This algorithm is the same as SCAN but when it reaches the end it doesn't reverse direction, instead it wraps back around to the beginning and continues in the same direction.

   b)

     hand drawn

2.

     RAID-0:   C. Failure of one disk causes loss of data
     RAID-1:   A. Wastes disk capacity
     RAID-4:   D. Parity disk is performance bottleneck
     RAID-5:   B. Complicated calculation of data and parity location

3.

     hand drawn

4.

   a)

     The largest supported file is found by the following expression:
     $(12 \times 8KB) + (2048 \times 8KB) + (2048 \times 2048 \times 8KB) + (2048 \times 2048 \times 2048 \times 8KB)$

   b)

     Root Directory (1) – Reading content of root directory to find i-node of /a

     I-Node (1) – Reading the i-node structure of file /a to access file's block pointers

     Single Indirect Block (1) – Reading the access pointer to block 14

     Block 14 (1) – Reading the content of block 14 of the file /a

     = 4 disk reads