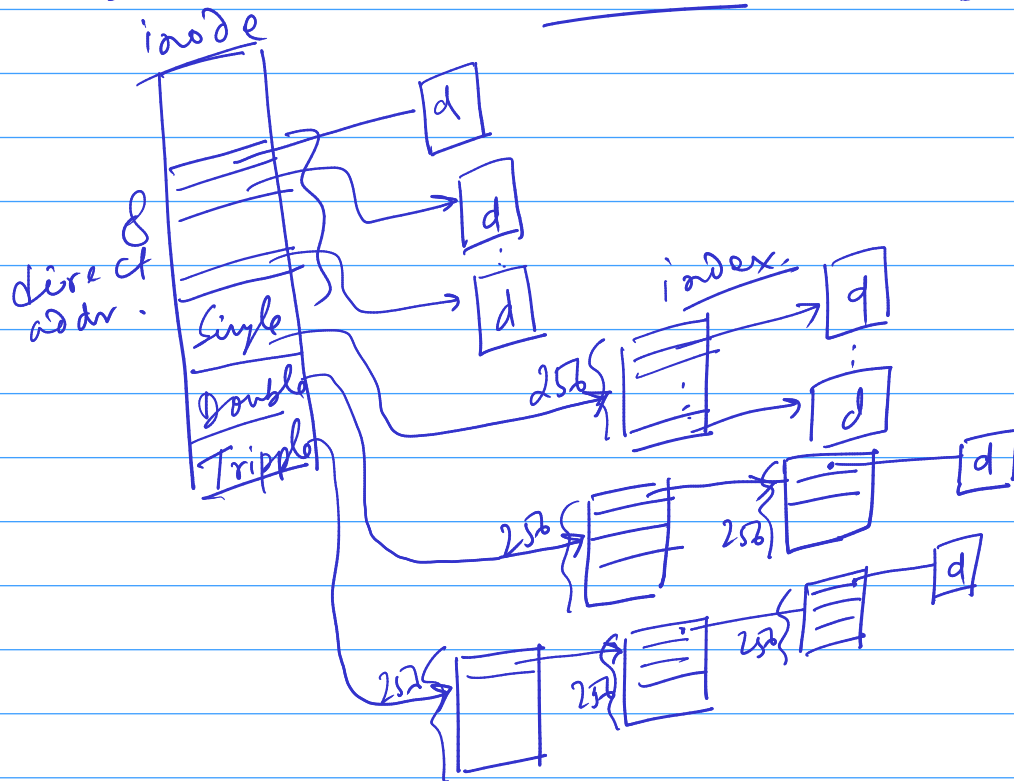


- e. In a particular Unix OS, each data block is of size 4096 bytes, each i-node has 8 direct data block addresses and three additional addresses: one for single indirect block, one for double indirect block and one for triple indirect block. Also each block can contain addresses for 256 blocks. What is the approximate maximum size of a file?

$$\text{Data Block} = 4096 \text{ B} = 2^{12} \text{ B}$$



Direct Addr. = 8 Data Block.

Single Indirect = 256 " "

Double " = 256 × 256 " "

Tripple " = 256 × 256 × 256 " ',

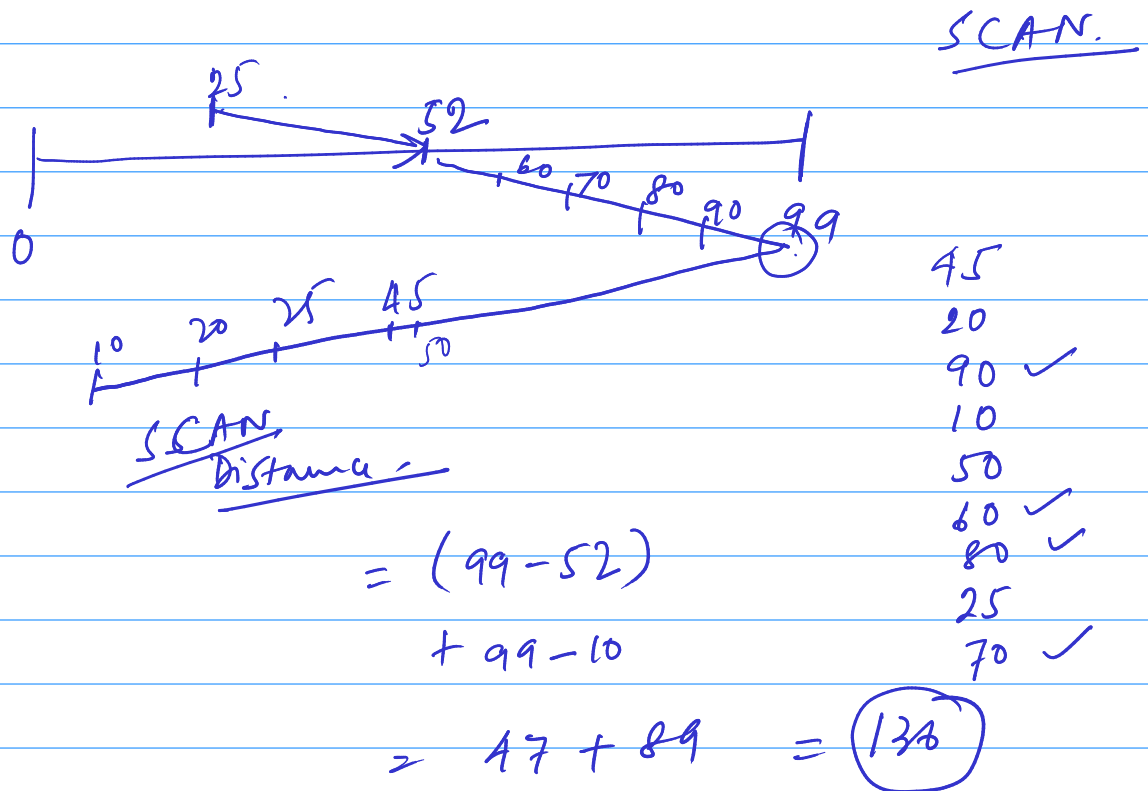
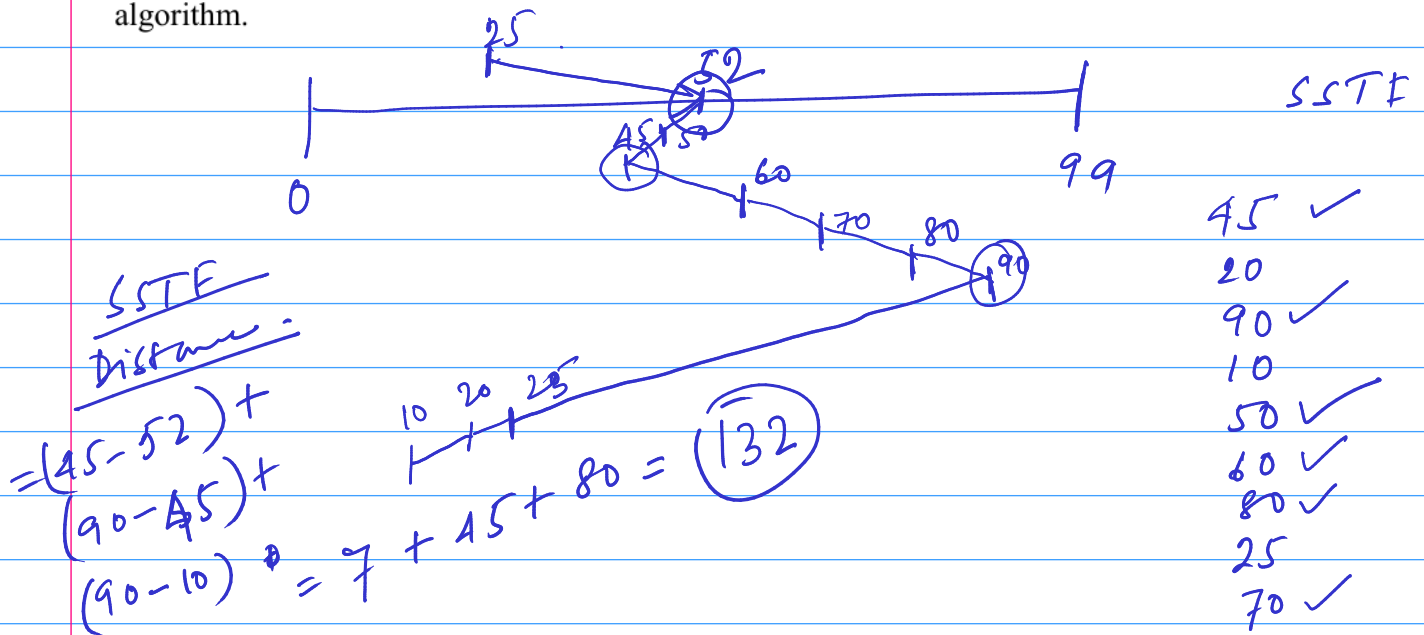
$$\text{Max. File Size} = \left(8 + 256 + 256 \times 256 + 256 \times 256 \times 256 \right) \times 2^{12} \text{ B}$$

256
Blocks

$$= \left(2^3 + 2^8 + 2^{16} + 2^{24} \right) \times 2^{12} \text{ B}$$

$$\approx 2^{36} \text{ B} = 64 \text{ GB}$$

Suppose the following disk request sequence (track numbers) for a disk with 100 tracks is given: 45, 20, 90, 10, 50, 60, 80, 25, 70. Assume that present position of the R/W head is on track 52 and the previous request was for track no 25. Determine the additional distance (in terms of number of tracks) that will be traversed by the R/W head when the Shortest Seek Time First (SSTF) algorithm is used compared to the SCAN (Elevator) algorithm.



A disk pack has 16 surfaces, 256 tracks per surface and 64 sectors per track. Size of each sector is 512 bytes. Determine the size of the disk pack. Also determine the number of bits required to address each cylinder and each sector.

$$\begin{aligned}S &= \text{no. of surfaces} = 16 = 2^4 \\t &= \text{no. of tracks/surface} = 256 = 2^8 \\c &= \text{no. of sectors/track} = 64 = 2^6 \\ \text{Size of disk} &= S \times t \times c \quad \text{sectors} \\&= 2^4 \times 2^8 \times 2^6 \quad \text{sector} \\&= 2^{18} \text{ sectors} \\&= 2^{18} \times 2^9 \text{ B} \\&= 2^{27} \text{ B} = 128 \text{ MB}\end{aligned}$$

$$\begin{aligned}\text{Total no. of sectors} &= 2^{18} \Rightarrow 18 \text{ bits to addr. each sector.} \\ \text{Total no. of cylinder} &= 2^8 \Rightarrow 8 \text{ bits to addr. each cylinder}\end{aligned}$$