

analysis:

Read original data: 10,000 I/Os
write runs : 1000 I/Os
Read runs : 1000 -
Fetch all tuples: 100,000 I/Os
write sorted data : 10000 -

122,000 I/Os

2a)

$$R = 122,000 \text{ tp}$$

$$\text{Blocks: } 8192 - 80 = \underline{8112 \text{ bt/BK}}$$

$$\text{records: } x+y+z + \text{header} \Rightarrow 40+160+120+32$$

$$\left[\frac{8112}{352} \text{ bt/BK} \right] \text{ bt/rd} = \underline{\frac{23 \text{ rd}}{1 \text{ BK}}}$$

$$\text{Files BLOCK} = \left\lceil \frac{122,000 \text{ tp}}{23 \text{ tp/BK}} \right\rceil = \underline{\lceil 5217.37 \text{ BK}}$$

$$= \underline{\lceil 5218 \text{ BK} \rceil}$$

a) Min Memory: $n(n-1) \geq 5218$

$$n^2 - n \geq 5218 \mid n^2 - n - 5218 \geq 0$$

$$n^2 - n - 5218 \geq 0$$

$$\begin{array}{rcl} 72 \times 72 & = & 5184 \\ 72 \times 73 & = & 5256 \\ 72 \times 71 & = & 5112 \end{array}$$

$$\underline{n = 72}$$

b) $I/O_S = 4 \times 15218 = 20,872$

c) $B_r +$
 $Total = 2B_r + 2BK + T$

$$BK = BK_{PP} = 7$$

$$\text{pointers} = 10 + 40 = 48 \text{ bt/KPP}$$

$$BK_{PP} : \left\lfloor \frac{8112 \text{ bt}}{48 \text{ bt/KPP}} \right\rfloor = 169 \text{ KPP/BK}$$

$$\therefore \text{total Br file} : \left[\frac{120,000 \text{ KPP}}{169 \text{ KPP/BK}} \right] = 711 \text{ BR}$$

$$\text{Blocks for KPP} = \underline{711 \text{ BR}}$$

a) 711 I/O to store all KPP

1. read Block file and : 5184 I/O

2. read write chunk to memory = 711 I/O

3. read write to matte in sublist = 711 I/O

4. Read the sorted sublists of key-pointer-pairs from disk: 5184 I/O's

5. retrieve pointer to file = 120,000 I/O

6. write to disk = 5184 I/O

$$= 10,388 + 1482 + 120,000 = 131,790 \text{ I/O}$$