

Q3)

ORDERS (order #, order date #, product, quantity, price-per-unit)

data blocks: 1000 } total rows: 50000

blocking factor: 50

distinct product: 200

distinct price-per-unit: 100.

PK: order #

indexed: product

indexed: price-per-unit

fanout: 10

leaf level index price-per-unit: 30

leaf level index order #: 200.

3-1) the system will traverse horizontally at leaf level of product index.

$$\text{best case} = \frac{50000}{200 \times 50} = 5$$

$$\text{worst case} = \frac{50000}{200} = 250$$

$$\text{avg} = \frac{250+5}{2} = 127.5 \text{ read blocks}$$

3-2) the system will traverse horizontally at leaf level of product index.

$$\therefore \text{total read blocks} = 200 \text{ (distinct values)}$$

3-3) the system will traverse horizontally at leaf level of price-per-unit index.

$$\therefore \text{total read blocks} = 30$$

3-4) the system traverse horizontally at leaf level of order # index.

$$\therefore \text{total read blocks} = 200$$

3-5) it involves an 'or' operator and the condition 'order # = 12345' cannot be satisfied using primary key index. Hence, the system will perform a full-table scan, and the total read blocks will be 1000.

3-6) as there are no 'where' clause in the query, it implies that all rows are needed. The system will perform a horizontal scan at leaf level using the primary key index.

\therefore total read blocks = 200 ~~4~~