

Task 3

Each manufacturer manufactures many disk-drives, and the manufacturer assigns each disk-drive a serial number. The serial number is unique within a manufacturer, but not across all other manufacturers. The manufacturer registers the model of the disk-drive it produces to the intellectual property Office of Singapore (IPOS) so that the model of the disk drive is protected and cannot be used by other manufacturer. The disk-drives are manufactured by batch, and all the disk-drives manufactured in a batch are of the same model, and all the disk- drives of the same model have the same capacity. A distributor collaborates with many manufacturers to help the manufacturers to distribute the disk-drives the distributor receives to retailers. A distributor creates a relational table DISK_DRIVE to store the information/attributes of the disk drive it distributes to retailers as follows:

DISK_DRIVE(serialNum, manufacturer, model, batch, capacity, retailer)

Each tuple in the relation DISK_DRIVE contains information about a disk drive with a unique serialNum, made by a manufacturer, with a particular model number, released in a certain batch, which has a certain storage capacity and is sold by a certain retailer. For example, the tuple Disk_drive('1978649', 'Western-Digital', 'A2235X', '765234', 500, 'CompSingapore') specifies that WesternDigital made a disk drive with a serial number 1978649 and a model number A2235X, released in batch 765234; it is 500GB and is sold by CompSingapore.

Write each of the following statements as a function dependency:

- i. The manufacturer and serial number uniquely identify the drive.
- ii. A model number is registered by a manufacturer and hence cannot be used by another manufacturer.
- iii. All disk drives in a particular batch are the same model.
- iv. All disk drives of a certain model of a particular manufacturer have exactly the same capacity.

Ans i)

manufacturer, serialNum \rightarrow serialNum, manufacturer, model, batch, capacity, retailer

Ans ii)

manufacturer, model \rightarrow manufacturer

Ans iii)

batch \rightarrow model

Ans iv)

manufacturer, model \rightarrow capacity