MIS 301 RELATIONAL DATABASE MANAGEMENT SYSTEM

DATABASE MANAGEMENT SYSTEM

Models of Database Architecture

LECTURE 4&5

RELATIONAL DATA MODEL

- Data stored in two dimensional tabular structures
- Different tables are connected with the help of attributes drawing values from a common domain
- Queries are symmetrical
- Insertion and deletion are less complicated
- One to one relationship exists.

HIERARCHICAL DATA MODEL

- Inverted tree model

- Example: In a sales order processing system, a customer may have many invoices raised to him and each invoice may have different data elements. Thus, the root level of data is customer, the second level is invoice and the last level is line items such as invoice number, date, product, quantity, etc.

- The lower levels are owned by higher level data elements, and elements at the same level have no linkage at all.

- Asymmetry exists in queries. the query such as what products are purchased by which customer, in the above example, shall be difficult to carry out in the hierarchical structure.The query as to which customer purchased which product would be convenient.

- One to many relationship leads to asymmetry.

- Subordinates not linked to a superior may lead to data loss
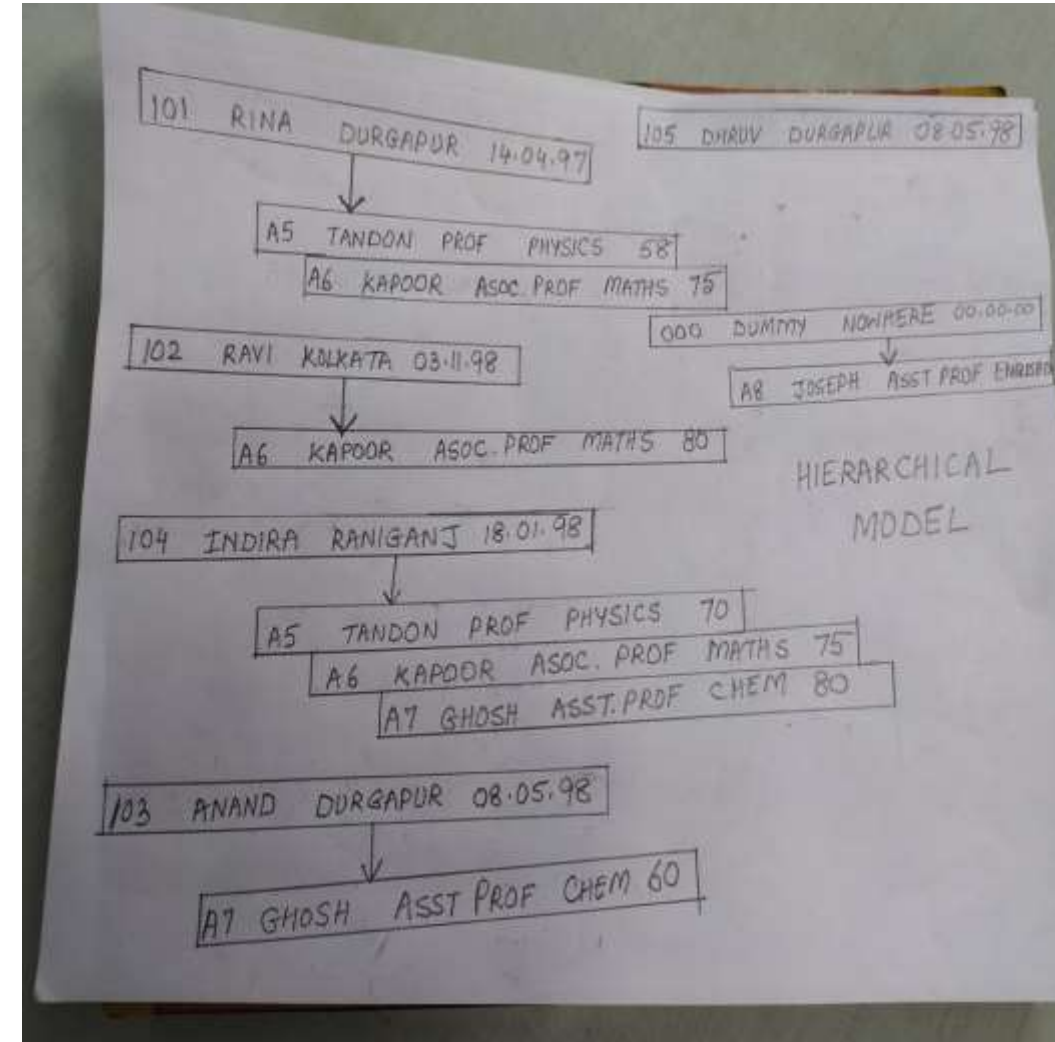
NETWORK DATA MODEL

- This is an extension of the Hierarchical model. In this model data is organized more like a graph, and are allowed to have more than one parent node.

- Queries are symmetrical

- Relationships are complicated but symmetrical

- Unlike the relational model, too many links exist.

- Many to many relationship leads to symmetry.
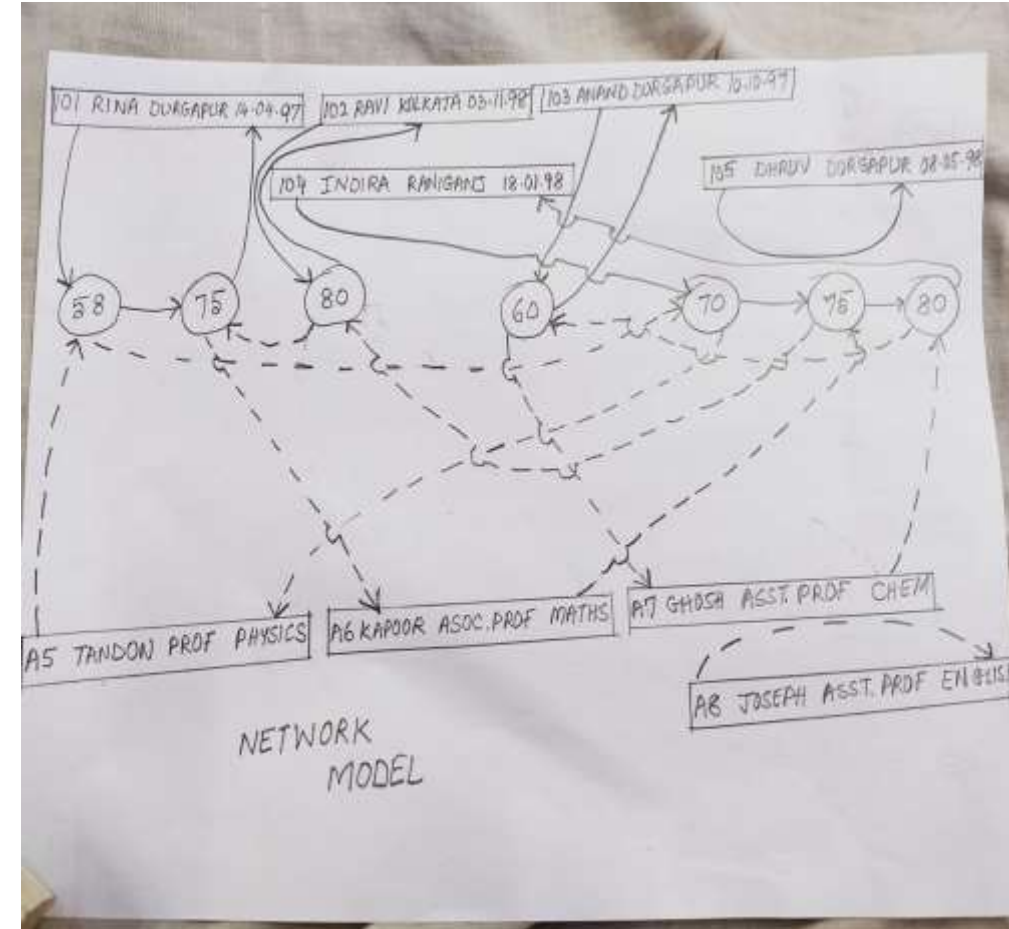
COMPARATIVE STUDY OF THE DATA MODELS

Hierarchical Data Model	Network Data Model	Relational Data Model
1. Relationship between records is of the parent child type.	1. Relationship between records is expressed in the form of pointers or links.	1.Relationship between records is represented by a relation that contains a key for each record involved in the relationship.
2. Many to many relationship cannot be expressed in this model	2. Many to many relationship can also be implemented in this model	2. Many to many relationship can be easily implemented.
3. It is a simple, straightforward and natural method of implementing record relationships.	3. Record relationship implementation is quite complex due to the use of pointers.	3. Relationship implementation is very easy through the use of a key or composite key field.
4. This type of model is useful only when there is some hierarchical character in the database.	4. Network model is useful for representing such records which have many to many relationships.	4. Relational model is useful for representing most of the real world objects and relationships among them.
5. Searching for a record is very difficult since one can retrieve a child only after going through its parent record.	5. Searching for a record is easy since there are multiple access paths to a data element.	5. A unique, indexed key field is used to search for a data element.
6. In Hierarchical model record relations are physical.	6.In Network model record relations are physical.	6. Relational model does not maintain physical connection among records, data is organized logically in the form of rows and columns and stored in table.
7. During updation or deletion process, chances of data inconsistency is involved.	7. No problem of inconsistency exists in Network model.	7. Data integrity maintaining methods like Normalization process are adopted for consistency.

- TILL WE MEET AGAIN IN THE NEXT CLASS……….