TASK_1

a)
• Initial phase -- characterize fully the data needs of the prospective database users.

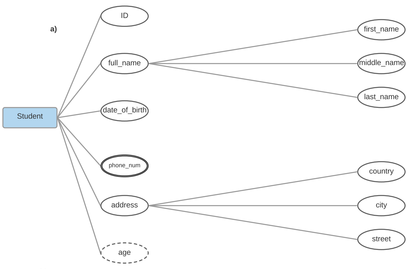
• Second phase -- choosing a data model • Applying the concepts of the chosen data model
  • Translating these requirements into a conceptual schema of the database.
  • A fully developed conceptual schema indicates the functional requirements of the enterprise.
  • Describe the kinds of operations (or transactions) that will be performed on the data.

• Final Phase -- Moving from an abstract data model to the implementation of the database
  • Logical Design – Deciding on the database schema.
    • Database design requires that we find a "good" collection of relation schemas.
    • Business decision – What attributes should we record in the database?
    • Computer Science decision – What relation schemas should we have and how should the attributes be distributed among the various relation schemas?
  • Physical Design – Deciding on the physical layout of the database

b)
Entity Relationship Model:
• Models an enterprise as a collection of entities and relationships
  • Entity: a "thing" or "object" in the enterprise that is distinguishable from other objects: described by a set of atributes
  • Relationship: an association among several entities
• Represented diagrammatically by an entity-relationship diagram

TASK_2

a)



b)

TASK_3

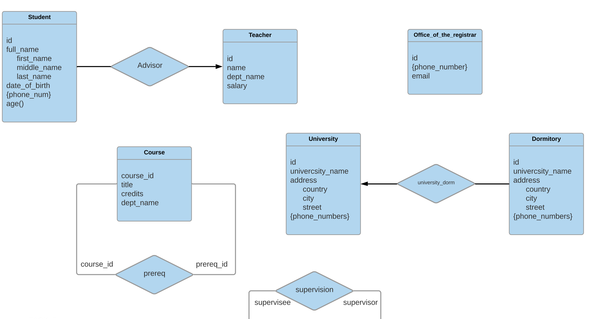
• One-to-one relationship between an instructor and a student:
  • A student is associated with at most one instructor via the relationship advisor
  • A student is associated with at most one department via stud_dept

• one-to-many relationship between an instructor and a student:
  • an instructor is associated with several (including 0) students via advisor
  • a student is associated with at most one instructor via advisor

• In a many-to-one relationship between an instructor and a student:
  • an instructor is associated with at most one student via advisor
  • and a student is associated with several (including 0) instructors via advisor

  • An instructor is associated with several (possibly 0) students via advisor
  • A student is associated with several (possibly 0) instructors via advisor

TASK_4



TASK_5