

## Project Phase - 3

### Corrections :

1. In the "Staff" entity type, "Name" attribute is changed from multi-valued to 3 attributes, "First Name", "Middle Name", "Last Name".
2. In "Centre" entity type, attributes "City", "State", "PIN Code" are removed.
3. In the "Education Details" entity type, add an attribute "10th or 12th".
4. In "Parent/Guardian" weak entity type, "Name" partial key attribute is changed from multi-valued to 3 partial key attributes, "First Name", "Middle Name", "Last Name".
5. In "Parent/Guardian" weak entity type, "Qualifications" attribute is changed from multi-valued to trivial.
6. In the "Students" entity type, "Name" attribute is changed from multi-valued to 3 attributes, "First Name", "Middle Name", "Last Name".
7. In the "Students" entity type, "Address" attribute is changed from composite to multi-valued.

### Mapping ER to relational model :

1. Created separate tables for each strong entity type, weak entity type, trivial relationships, identifying relationships.
2. Each table of an entity type consists of its attributes and their domain values.
3. Each table of a relationship consists of the primary/partial keys of the related entities.
4. Entities are related by the foreign key concept.
5. As "Students" entity type has a multivalued attribute "Address", it is separated from the entity table and a separate table is created named "Address\_Student", which has "Application\_Number" from "Students" entity and "Address".

### Relational model to 1NF :

The relational model is already in the first normal form (1NF), as it only has atomic values, that is without multivalued and composite attributes.

### Relational model to 2NF :

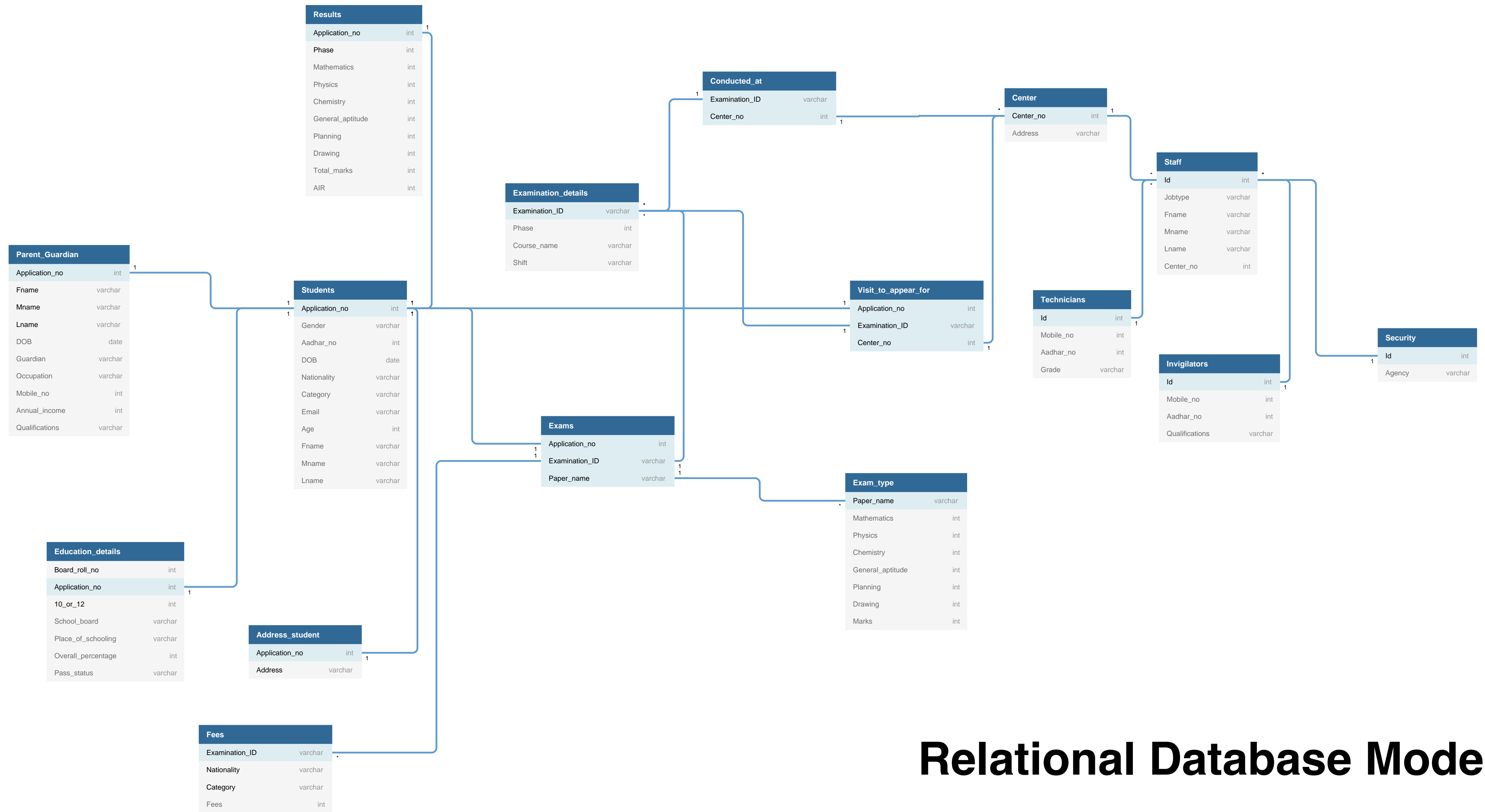
The relational model is already in the second normal form (2NF), as every non-prime attribute is fully functionally dependent on the primary key.

## Relational model to 3NF :

There is an attribute "Age" in the "Students" entity type, which is transitively dependent on "Application\_Number".

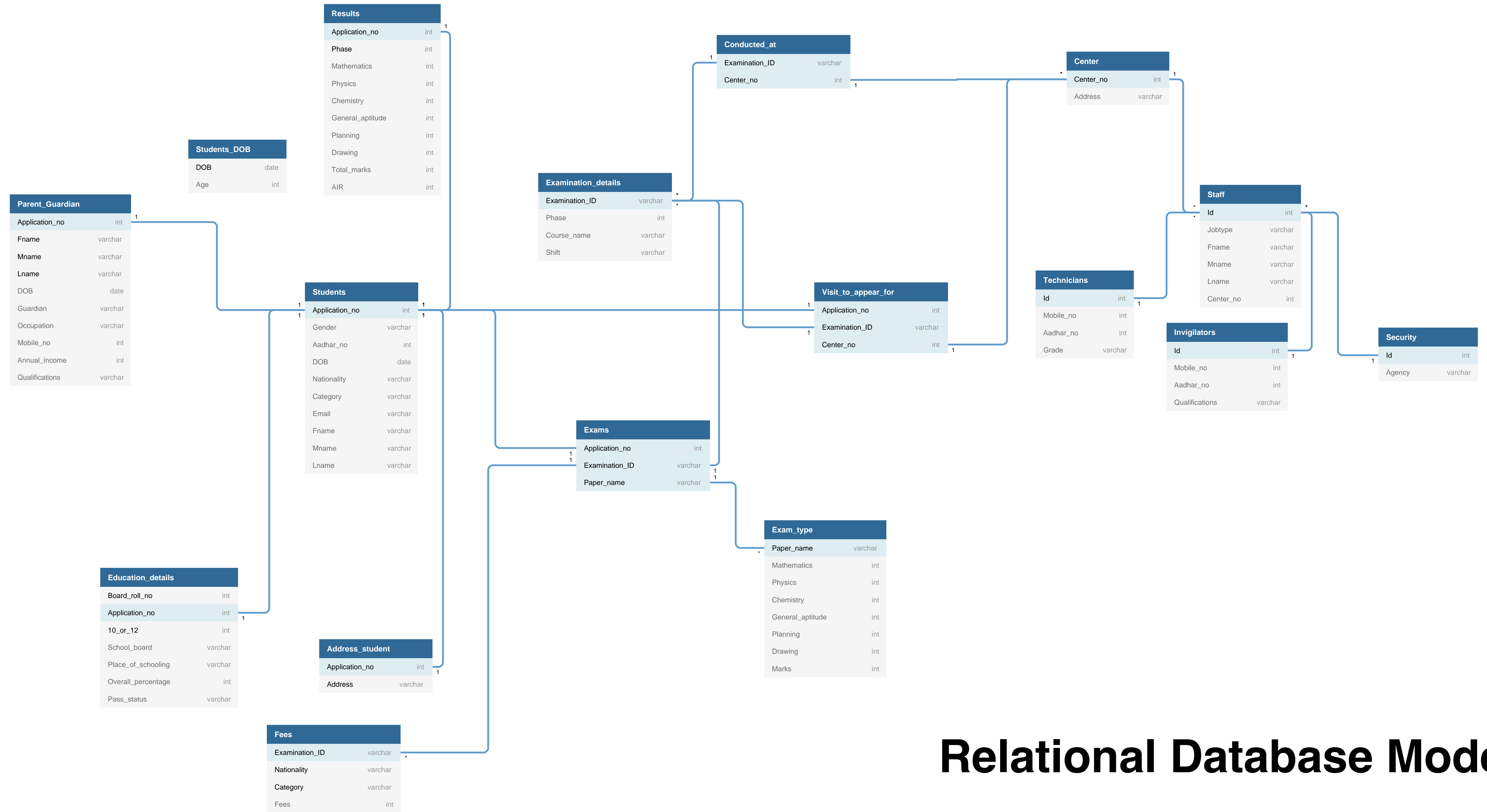
"Application\_Number"      =>      "Date\_of\_Birth(DOB)"  
"Date\_of\_Birth(DOB)"      =>      "Age"

In order to remove the transitive dependency, we create a new table named "Student\_DOB", which consists of "DOB" and "Age" and remove the attribute "Age" from "Students" entity.



Relational Database Model

Normalised to 2NF



# Relational Database Model

Normalised to 3NF