

Project Phase - 3

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We first derived the Relational Schema from the previously done ER diagram.

1NF

To convert it to 1NF, we just created new relations for multivalued attributes.

2NF

To convert the schema to the 2nd Normal Form, we had to handle cases where subsets of the primary key uniquely identified non-prime attributes.

For example, in Project_Field, the Field attribute can be uniquely identified with the Field_Id alone.

This is because each field (Like 'Robotics', 'Quantum Computing', etc.) can be uniquely identified from its own Field_Id.

Similarly, Courses_Offered has also been handled. Courses_Offered has been changed to Institute_Offers, and the Courses table now relates the Course_Id to the Course. Similarly, Contains_Department has also been handled.

3NF

To convert the schema from 2nd Normal Form to 3rd Normal Form, we need to check for transitive dependencies.

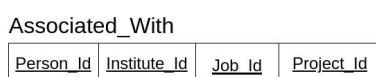
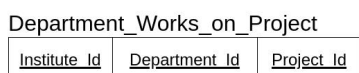
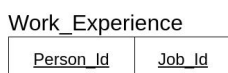
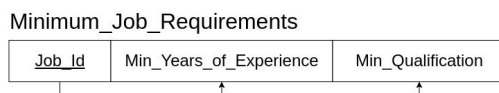
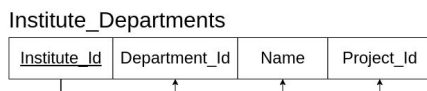
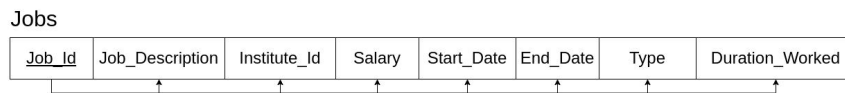
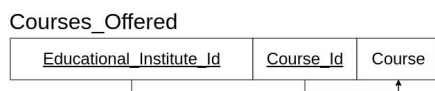
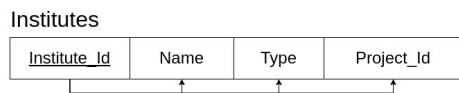
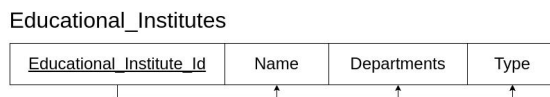
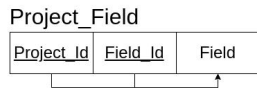
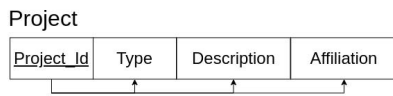
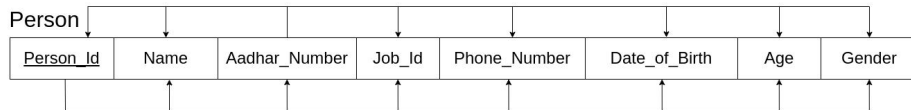
We have constructed the schema in such a way that such dependencies do not exist, therefore our schema in 2nd Normal Form is also in 3rd Normal Form.

Key Notes

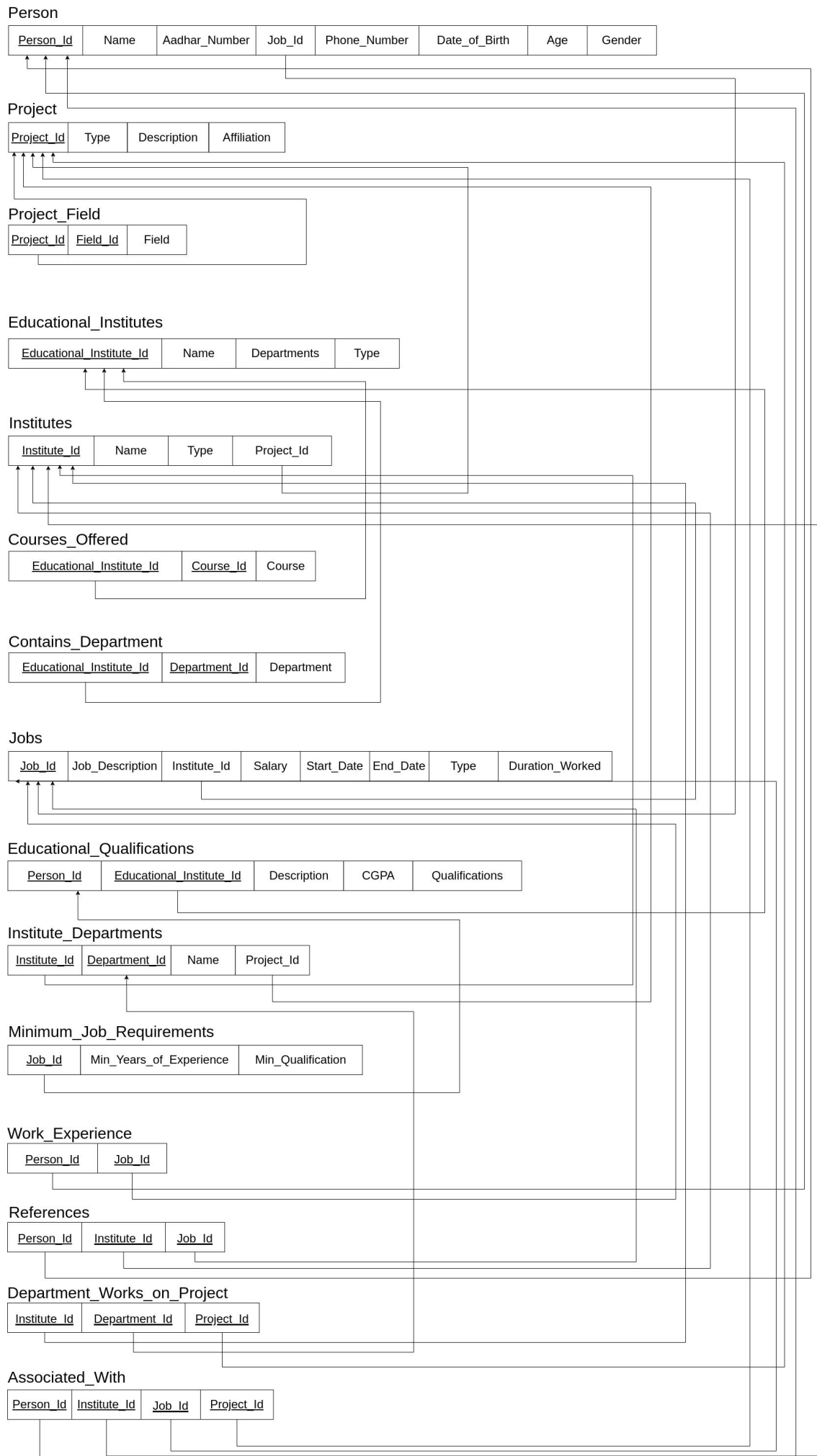
- Changed affiliation to affiliation_institute_id which is a foreign key that refers to the institute id in Institute
- For the relation Point of contact, since it is a *recursive relation*, we can directly denote it in the Person Table, by adding a new column to Person (by the name of PoC_Id)
- For the Offers relation, one job is offered by one institute, so we can represent this by adding one column to Jobs, by the name of Institute_Id, which refers to Institute.
- To handle the Work_Experience relation, we need to create a separate table, because it is an N:M relation, as multiple jobs can be taken by multiple people at different points in time.
- The Studied_In relation is already encompassed by the Educational_Qualifications entity.

Functional Dependency Diagram

After converting to 1 NF

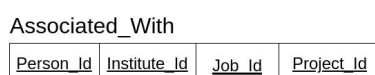
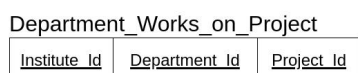
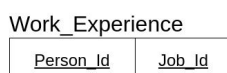
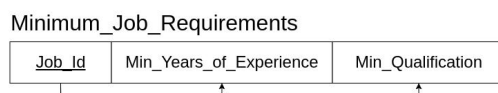
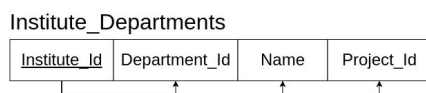
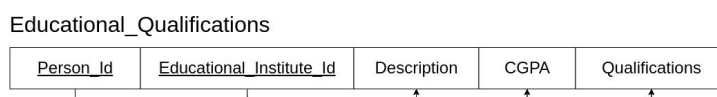
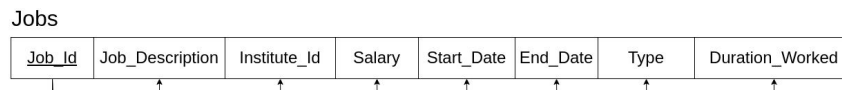
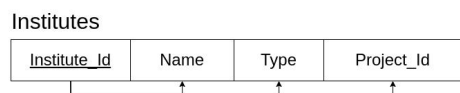
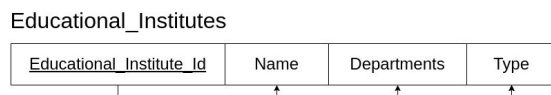
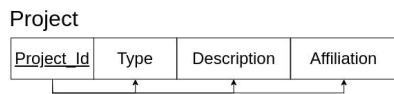
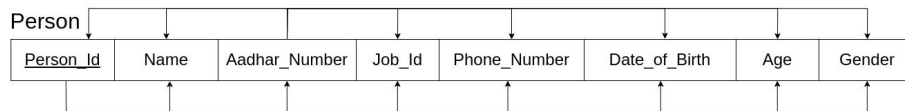


Entity Relationship Diagram After converting to 1 NF

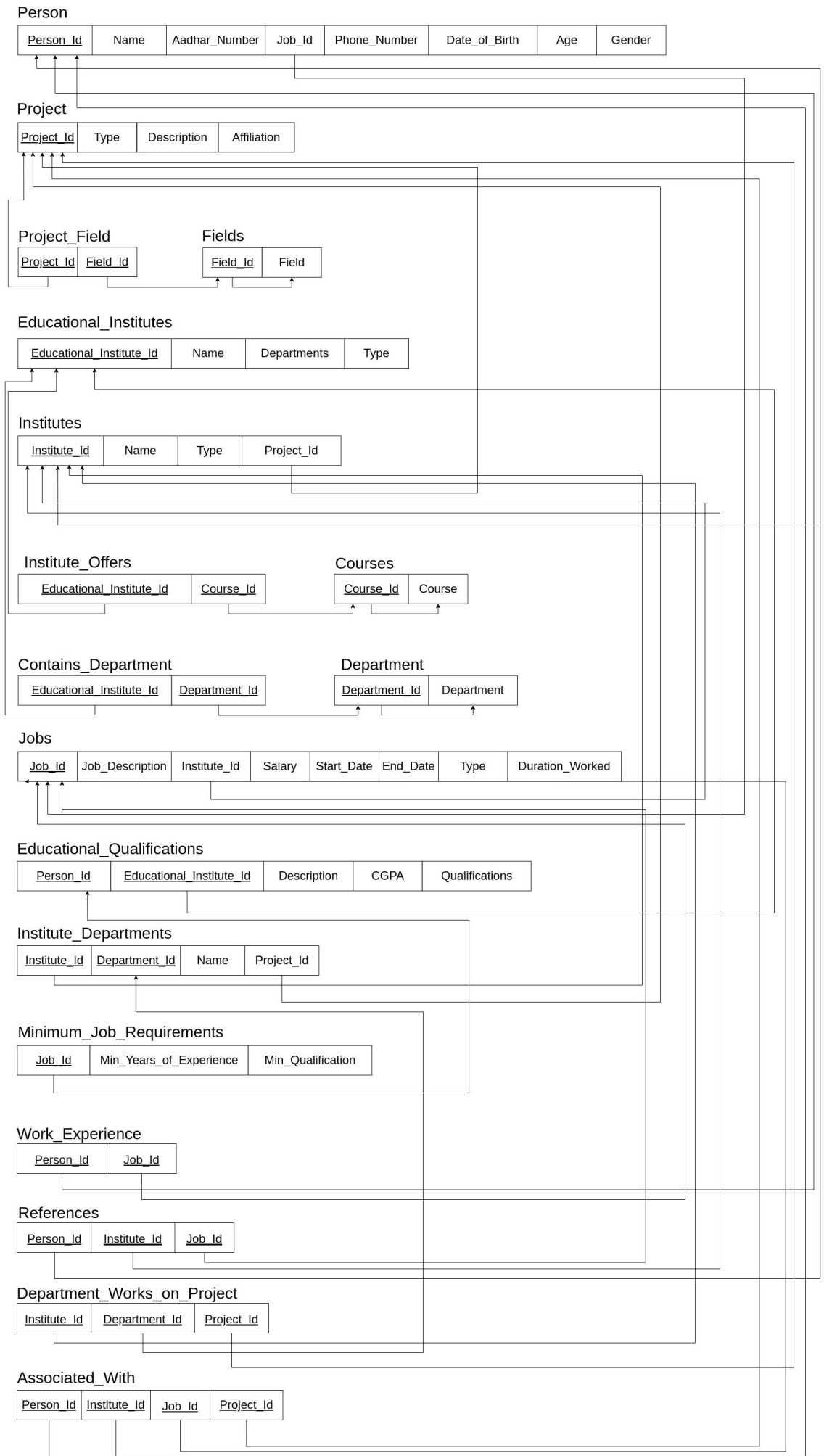


Functional Dependency Diagram

After converting to 3 NF



Entity Relationship Diagram After converting to 3 NF



To View all the Diagrams drawn and interact with them, please refer to the links below -

- Functional Dependency Diagram after converting to 1 NF:
https://drive.google.com/file/d/1SSKaZECPaL-KIYLfR3_h9bcQdqdKBGgL/view?usp=share_link
- Entity Relationship Diagram after converting to 1 NF:
https://drive.google.com/file/d/1SSKaZECPaL-KIYLfR3_h9bcQdqdKBGgL/view?usp=sharing
- Entity Relationship Diagram after converting to 3 NF:
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- Functional Dependency Diagram after converting to 3 NF:
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