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1. ER to Relational Model

- a. Specialization of staff is mentioned by using bool attributes (is manager/operator/maintainer) in relation STAFF.
- b. Managed by and Working at relations in ER model are merged and replaced by Works at in STAFF.
- c. Generally, tickets are of type adult, child, old age. It is redundant to maintain available rides separately for every ticket. So, we introduced an attribute called Type for ticket and bool attributes (For\_adult/child/old) are used for every ride to mention which type of visitors are eligible for it.
- d. Multivalued attributes (phone numbers), M: N relations (visited attractions) are converted into separate relations. Composite attributes of an entity type are listed as set of simple attributes.

2. 1NF

- a. Multivalued attributes were handled in previous step. So, all the attributes are atomic and thus it is in 1NF.

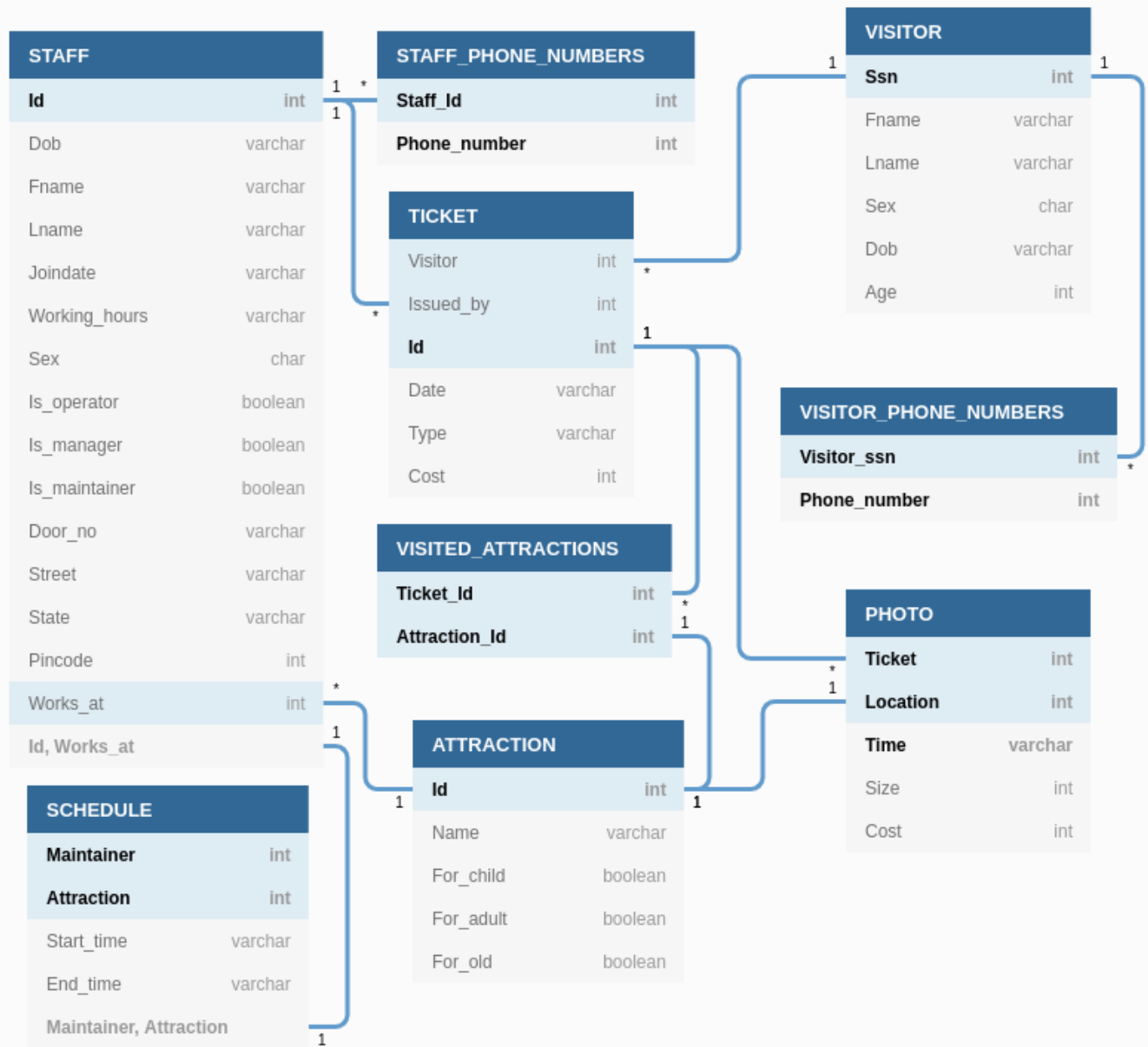
3. 2NF

- a. There is no partial dependency with respect to primary key and non-prime attributes in relations which have primary key as multiple attributes. So, it is in 2NF.

4. 3NF

- a. In relation VISITOR, Age transitively depends on the primary key Ssn through Date of birth. Therefore, a new relation is setup with primary key Date of birth and Age as normal attribute.
- b. In relation TICKET, Cost (of ticket) transitively depends on primary key Id through Type (of ticket). Therefore, a new relation is setup with primary key Type and Cost as normal attribute.

## ER to Relational,1NF,2NF



### 3NF

