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# Normalization Step-by-Step Sample

Relational Databases Basics



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We have to store the following data:

- employee full name (surname, middle name, given name);
- employee position;
- employee department;
- department phones;
- if a corporate car should be available for an employee;
- names and birthdates of all employee's children.

## 0NF (zero normal form)

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# 1NF (first normal form), atomizing attributes, step 1

## Natural PK

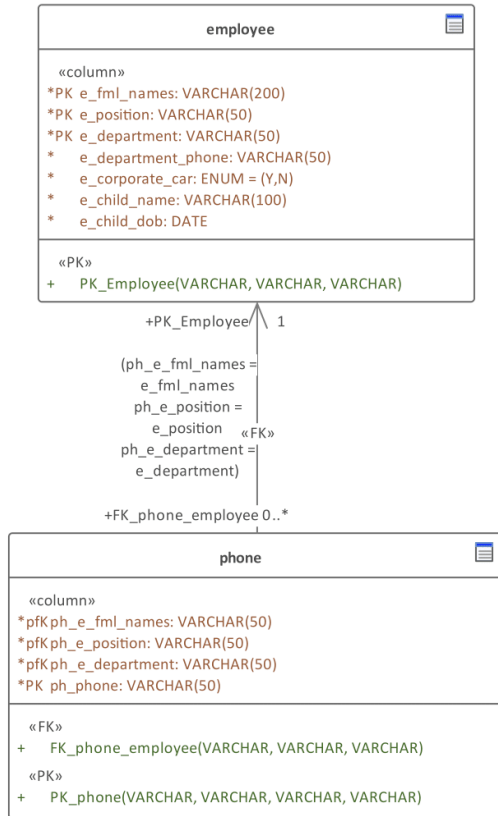
employee	
«column»	
*PK	e_fml_names: VARCHAR(200)
*PK	e_position: VARCHAR(50)
*PK	e_department: VARCHAR(50)
*	e_department_phone: VARCHAR(50)
*	e_corporate_car: ENUM = (Y,N)
*	e_child_name: VARCHAR(100)
*	e_child_dob: DATE
«PK»	
+	PK_Employee(VARCHAR, VARCHAR, VARCHAR)

## Surrogate PK

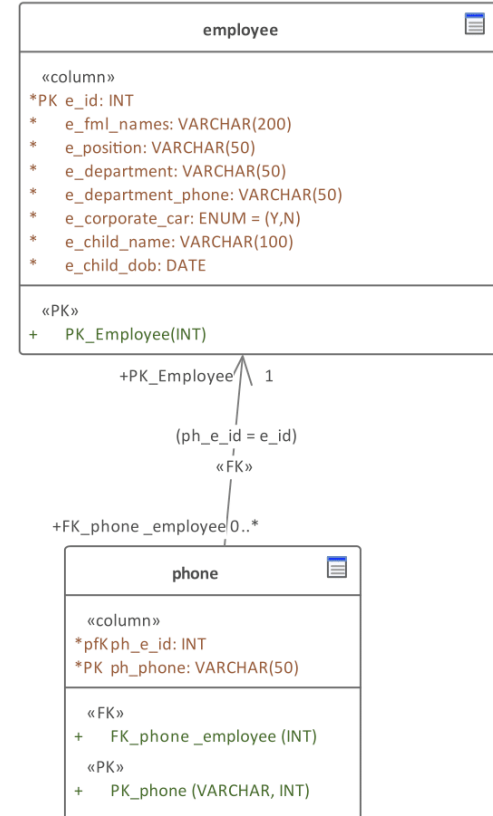
employee	
«column»	
*PK	e_id: INT
*	e_fml_names: VARCHAR(200)
*	e_position: VARCHAR(50)
*	e_department: VARCHAR(50)
*	e_department_phone: VARCHAR(50)
*	e_corporate_car: ENUM = (Y,N)
*	e_child_name: VARCHAR(100)
*	e_child_dob: DATE
«PK»	
+	PK_Employee(INT)

# 1NF (first normal form), atomizing attributes, step 2

## Natural PK

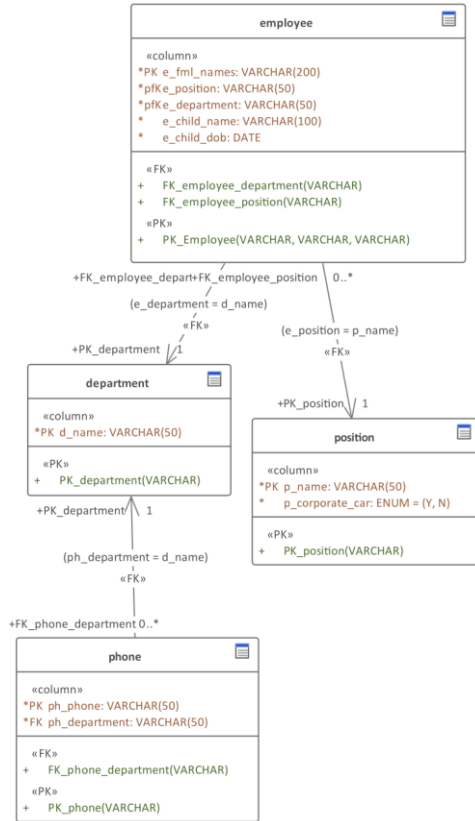


## Surrogate PK

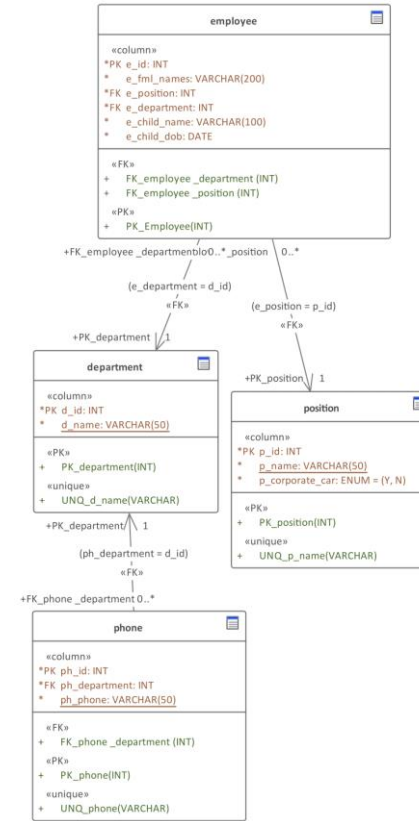


# 2NF (second normal form), eliminating partial dependencies

## Natural PK

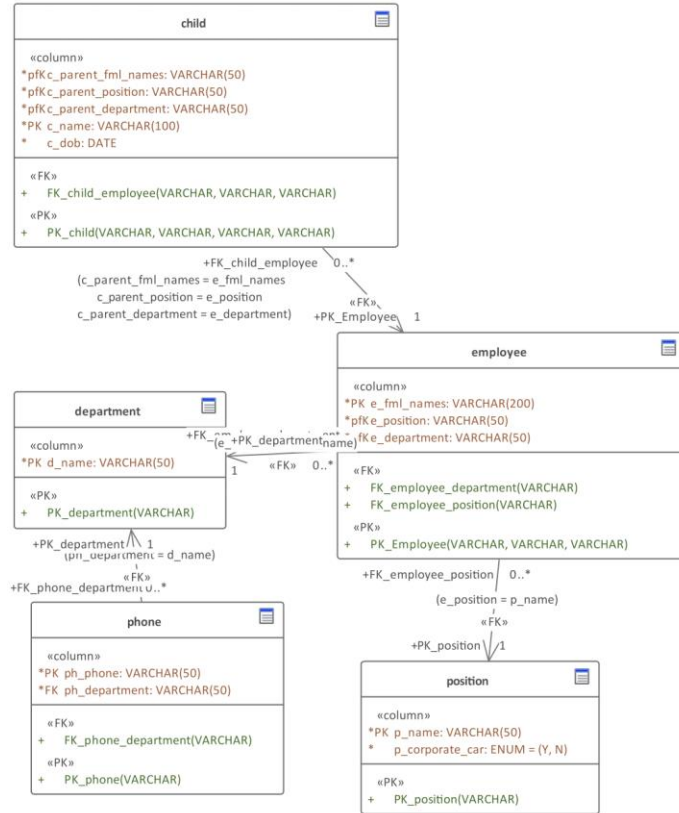


## Surrogate PK

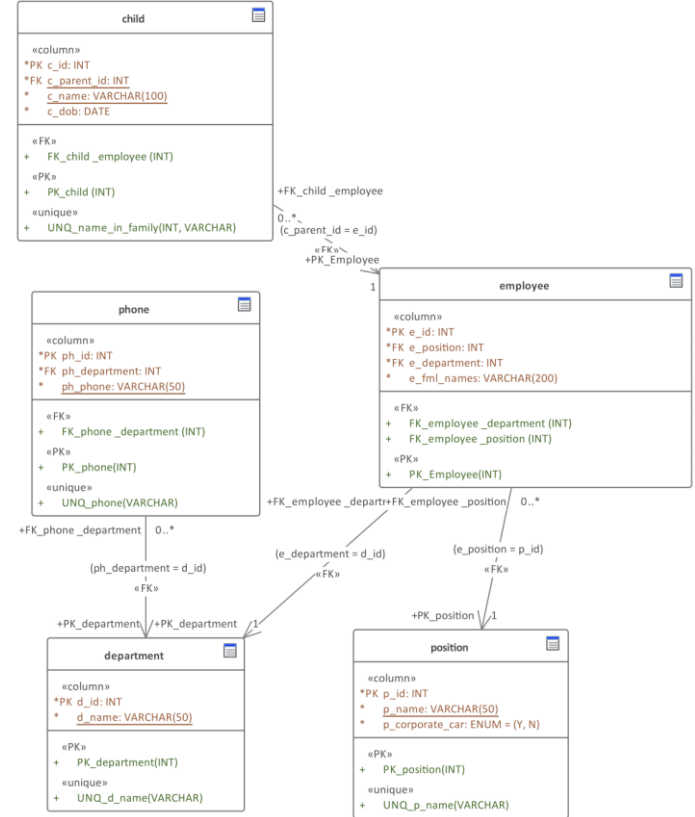


# 3NF (third normal form), eliminating transitional dependencies

## Natural PK



## Surrogate PK



P.S.

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Further normalization for this particular database is both unnecessary and impossible.



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