CS-360

Project Report

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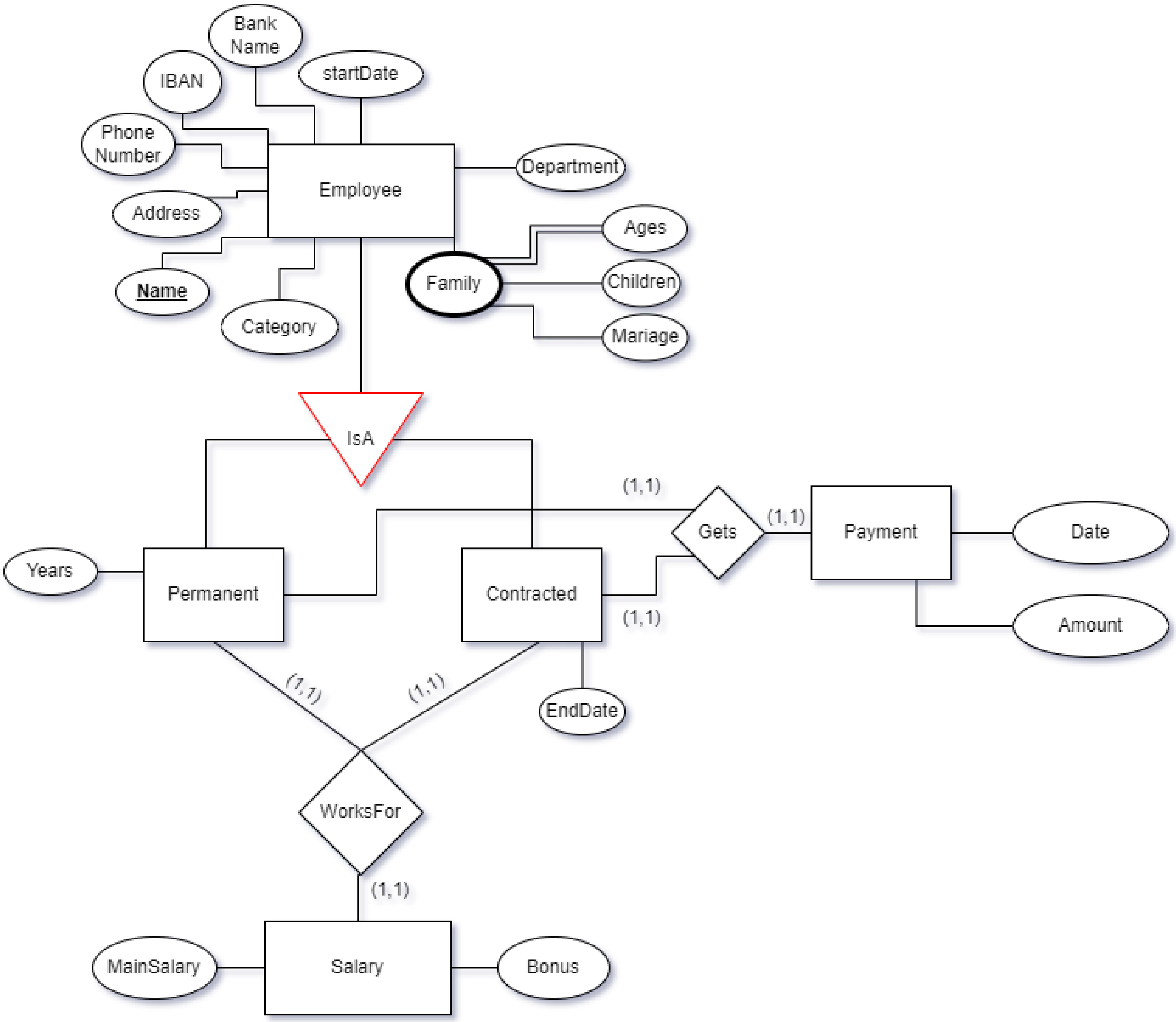
Content.

ER Diagram.


Bank Name
IBAN
startDate
Phone Number
Employee
Department
Address
Ages
Name
Family
Children
Category
Mariage
IsA
(1,1)
Gets
(1,1)
Payment
Date
Years
Permanent
Contracted
(1,1)
Amount
(1,1)
(1,1)
EndDate
WorksFor
(1,1)
MainSalary
Salary
Bonus

Entities (Names,Types,Keys,Cardinalities).

Permanent:

Name (String)

Address (String)

Phone Number (String)

IBAN (String)

BankName (String)

StartDate (DATE:SQL)

SalaryID (uint32)

Department (String)

Children (SMALLINT:SQL unsigned)

Mariage (Bool)

Category (BIT:SQL)

Years(TINYINT:SQL unsigned)

Contracted:

Name (String)

Address (String)

Phone Number (String)

IBAN (String)

BankName (String)

StartDate (DATE:SQL)

SalaryID (uint32)

Department (String)

Children (SMALLINT:SQL unsigned)

Mariage (Bool)

Category (BIT:SQL)

EndDate(DATE:SQL)

Ages:

Name (String)

Age (ENUM:SQL)

Salary:

Name (String)

Bonus (uint32)

MainSalary (uint32)

Payment:

Name (String)

Date (DATE:SQL)

Amount (uint32)

ENTITY	**PRIMARY KEY**
Permanent	Name
Contracted	Name
Ages	Name (foreign key from permanent or contracted)
Salary	Name (foreign key from permanent or contracted)
Payment	Name (foreign key from permanent or contracted)

* We divided Employee Entity in 2 Entities **Permanent** and **Contracted** so we can lower the cost of searching in the DB.

Entity(Cardinality)	**Relation**	**(Cardinality)Entity**
Permanent(1,1)	Gets	(1,1)Payment
Permanent(1,1)	WorksFor	(1,1)Salary
Contracted(1,1)	Gets	(1,1)Payment
Contracted(1,1)	WorksFor	(1,1)Salary

* We use Min,Max orientation. Also every Cardinality is set to 1,1 because each employee name can exist to one payment and salary and Each payment or salary relates to only one employee.

Relational Model.

Permanent

Name	Address	Phone Number	IBAN	Bank Name	Start Date	SalaryID	Department	Children	Mariage	Category	Years

Contracted

Name	Address	Phone Number	IBAN	Bank Name	Start Date	SalaryID	Department	Children	Mariage	Category	EndDate

Ages

Name	Age

Salary

Name	Bonus	MainSalary

Payment

Name	Date	Amount

Keys & Functional Dependencies.

Permanent:

Name **->** Address,Phone,Number,IBAN,BankName,StartDate,SalaryID,Department, Children,Mariage,Category,Years

Contracted:

Name **->** Address,Phone,Number,IBAN,BankName,StartDate,SalaryID,Department, Children,Mariage,Category,EndDate

Ages:

Name **->** Age

Salary:

Name **->** Bonus,MainSalary

Payment:

Name **->** Date,Amount

3NF Without Data Loss.

For a Relation to be in 1NF it needs to:

- Attributes have to be atomic. ✅

  In our Model every Relation is in 1NF.

For a Relation to be in 2NF it needs to:

- Relation needs to be in 1NF. ✅
- Relation's Functional Dependencies can't be in the form: non-primary(key) **->** primary key. ✅

  In our Model every Relation is in 2NF.

For a Relation to be in 3NF it needs to:

- Relation needs to be in 2NF. ✅
- No Transitive Dependencies in Relation. ✅
- Relation's Functional Dependencies can't be in the form: non-primary(key) **->** non-primary(key). ✅

  In our Model every Relation is in 3NF.

Testing & Screenshots.

Comments.