
CS-360



Project Report

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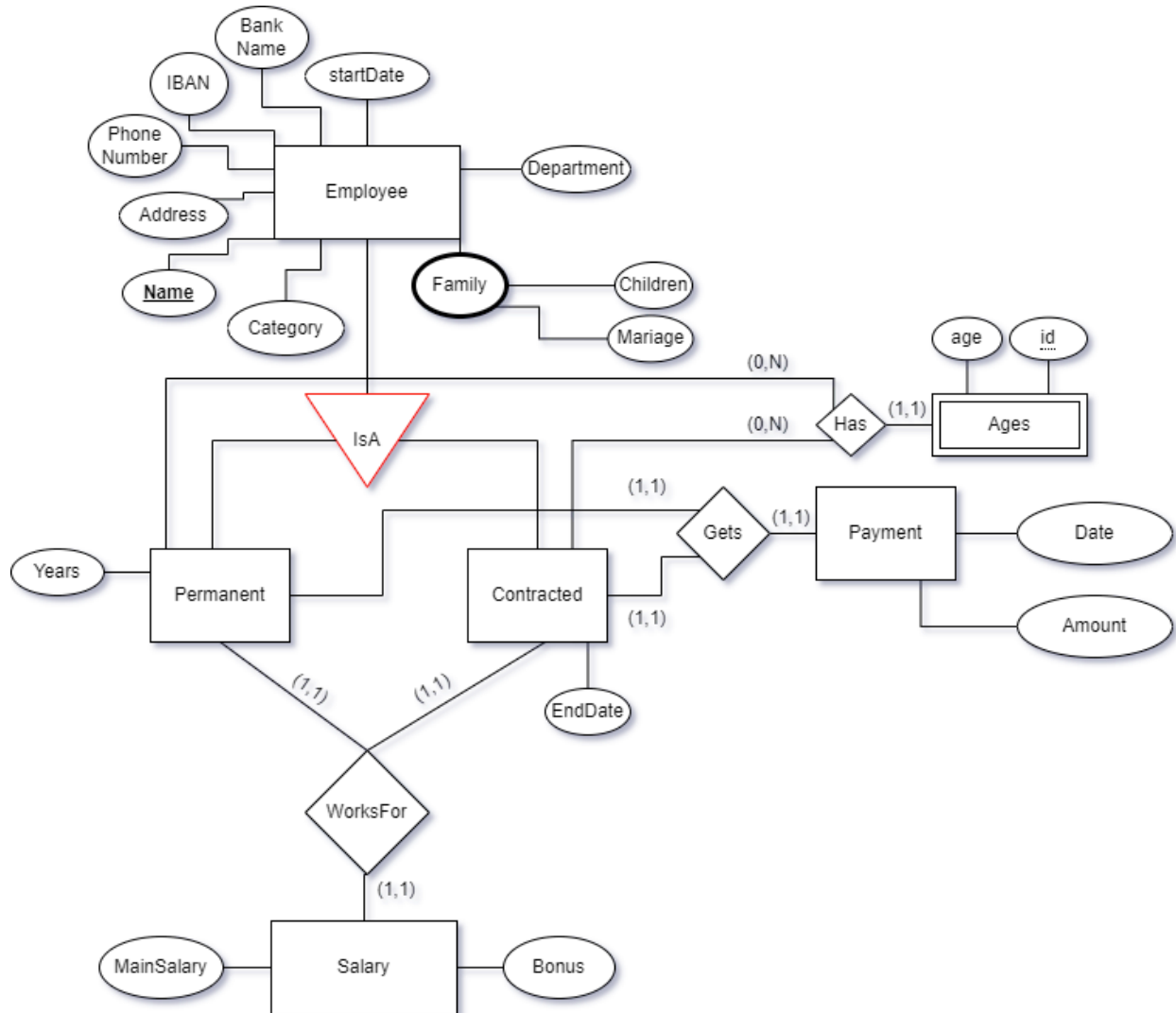
Theodoros Pontzouktzidis

Alexandros Markodimitrakis

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ER Diagram.



Entities (Names,Types,Keys,Cardinalities).

Permanent:

Name (VARCHAR)
Address (VARCHAR)
Phone Number (VARCHAR)
IBAN (VARCHAR)
BankName (VARCHAR)
StartDate (DATE)
Department (VARCHAR)
Children (INTEGER)
Mariage (BIT)
Category (BIT)
Years(INTEGER)

Contracted:

Name (VARCHAR)
Address (VARCHAR)
Phone Number (VARCHAR)
IBAN (VARCHAR)
BankName (VARCHAR)
StartDate (DATE)
Department (VARCHAR)
Children (INTEGER)
Mariage (BIT)
Category (BIT)
EndDate(DATE)

Ages:Name (VARCHAR)

Age (INTEGER)

Salary:Name (VARCHAR)

Bonus (INTEGER)

MainSalary (INTEGER)


Payment:Name (VARCHAR)

Date (DATE)

Amount (INTEGER)

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
Employee()	Has	(1,1)Ages

* 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

<u>Name</u>	Address	Phone Number	IBAN	Bank Name	Start Date	Department	Children	Mariage	Category	Years
-------------	---------	--------------	------	-----------	------------	------------	----------	---------	----------	-------

Contracted

<u>Name</u>	Address	Phone Number	IBAN	Bank Name	Start Date	Department	Children	Mariage	Category	EndDate
-------------	---------	--------------	------	-----------	------------	------------	----------	---------	----------	---------

Ages

<u>Name</u>	Age
-------------	-----

Salary

<u>Name</u>	Bonus	MainSalary
-------------	-------	------------

Payment

<u>Name</u>	Date	Amount
-------------	------	--------

**partial key*

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,id -> 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.

SQL Create-Insert Tables.

Create:

```
CREATE DATABASE IF NOT EXISTS salary_db;
```

```
CREATE TABLE permanent(  
    name VARCHAR(255) PRIMARY KEY,  
    address VARCHAR(255),  
    phone_number VARCHAR(255),  
    iban VARCHAR(255),  
    bank_name VARCHAR(255),  
    start_date DATE,  
    department VARCHAR(255),  
    children INTEGER,  
    married BIT,  
    category BIT,  
    years INTEGER);
```

```
CREATE TABLE contracted(  
    name VARCHAR(255) PRIMARY KEY,  
    address VARCHAR(255),  
    phone_number VARCHAR(255),  
    iban VARCHAR(255),  
    bank_name VARCHAR(255),  
    start_date DATE,  
    department VARCHAR(255),  
    children INTEGER,  
    married BIT,  
    category BIT,
```

end_date DATE);

```
CREATE TABLE ages(  
    name VARCHAR(255) PRIMARY KEY,  
    age INTEGER,  
    CONSTRAINT FK_1 FOREIGN KEY (name) REFERENCES permanent(name),  
    CONSTRAINT FK_2 FOREIGN KEY (name) REFERENCES contracted(name));
```


```
CREATE TABLE salary(  
    name VARCHAR(255),  
    main_salary DOUBLE,  
    bonus DOUBLE,  
    CONSTRAINT FK_3 FOREIGN KEY (name) REFERENCES permanent(name),  
    CONSTRAINT FK_4 FOREIGN KEY (name) REFERENCES contracted(name));
```

```
CREATE TABLE payment (  
    name VARCHAR(255),  
    date DATE,  
    amount DOUBLE,  
    CONSTRAINT FK_1 FOREIGN KEY (name) REFERENCES permanent(name),  
    CONSTRAINT FK_2 FOREIGN KEY (name) REFERENCES contracted(name));
```

Insert Examples:

```
INSERT INTO permanent(name, address, phone_number, iban, bank_name, start_date,  
department, children, married, category, years)SELECT 'Alexandros  
Markodimitrakis','Fourtounatou 6','6981073112','GR2701121149381872825494513','Piraeus  
Bank','2022-05-23','Programming',4,1,1,12 WHERE NOT EXISTS (SELECT 1 FROM contracted  
WHERE name = 'Alexandros Markodimitrakis');
```

```
INSERT INTO permanent(name, address, phone_number, iban, bank_name, start_date,  
department, children, married, category, years) SELECT 'Konstantinos Vlachos','Ioannou  
Papakyriakou 2','6987654343','GR390817493816192387569304','Alpha  
Bank','2022-12-01','Support',0,1,0,10 WHERE NOT EXISTS (SELECT 1 FROM contracted  
WHERE name = 'Konstantinos Vlachos');
```



```
INSERT INTO permanent(name, address, phone_number, iban, bank_name, start_date,
department, children, married, category, years) SELECT 'Eleni Papadopoulou','Ermou
22','6980987654','GR39011211193818728254444','Eurobank','2022-06-15','Marketing',0,0,1,
8 WHERE NOT EXISTS (SELECT 1 FROM contracted WHERE name = 'Eleni Papadopoulou');
```

```
INSERT INTO permanent(name, address, phone_number, iban, bank_name, start_date,
department, children, married, category, years) SELECT 'Andreas Karatzas','Vassileos
Pavlou 12','6987654321','GR32011211493818728254111','National Bank of
Greece','2022-09-01','Human Resources',0,1,1,15 WHERE NOT EXISTS (SELECT 1 FROM
contracted WHERE name = 'Andreas Karatzas');
```

```
INSERT INTO permanent(name, address, phone_number, iban, bank_name, start_date,
department, children, married, category, years) SELECT 'Maria Tsakiri','Aristotelous
8','6981234567','GR35011211493818728254888','Proton Bank','2022-07-01','Sales',0,0,0,7
WHERE NOT EXISTS (SELECT 1 FROM contracted WHERE name = 'Maria Tsakiri');
```


```
INSERT INTO contracted(name, address, phone_number, iban, bank_name,
start_date,department, children, married, category, end_date) SELECT 'Theodoros
Pontzouktzidis','Theokritou 18','6906045239','GR4701121149381872825467513','Pancreta
Bank','2001-05-23','Mathematics',2,1,0,'2001-05-23' WHERE NOT EXISTS (SELECT 1 FROM
permanent WHERE name = 'Theodoros Pontzouktzidis');
```

```
INSERT INTO contracted(name, address, phone_number, iban, bank_name,
start_date,department, children, married, category, end_date) SELECT 'Eirini
Kostopoulou','Odos Athinas 45','6907451298','GR22011211493818728254456','Piraeus
Bank','2002-06-15','Finance',0,0,1,'2002-06-15' WHERE NOT EXISTS (SELECT 1 FROM
permanent WHERE name = 'Eirini Kostopoulou');
```

```
INSERT INTO contracted(name, address, phone_number, iban, bank_name,
start_date,department, children, married, category, end_date)SELECT 'Giorgos
Markakis','Iroon Politechniou 12','6905678923','GR31011211493818728254987','Alpha
Bank','2003-01-01','Engineering',0,1,0,'2003-01-01' WHERE NOT EXISTS (SELECT 1 FROM
permanent WHERE name = 'Giorgos Markakis');
```

```
INSERT INTO contracted(name, address, phone_number, iban, bank_name,
start_date,department, children, married, category, end_date)SELECT 'Katerina
Samara','Aristotelous 8','6908236547','GR25011211493818728254123','National Bank of
Greece','2001-07-01','Research',0,0,1,'2001-07-01' WHERE NOT EXISTS (SELECT 1 FROM
permanent WHERE name = 'Katerina Samara');
```

```
INSERT INTO contracted(name, address, phone_number, iban, bank_name,
start_date,department, children, married, category, end_date)SELECT 'Dimitrios
Alexakis','Kifisias
```



```
12','6905678901','GR36011211493818728254000','Eurobank','2002-03-01','Design',0,1,0,'20
02-03-01' WHERE NOT EXISTS (SELECT 1 FROM permanent WHERE name = 'Dimitrios
Alexakis');
```

```
INSERT INTO ages(name, age)VALUES('Alexandros Markodimitrakis',23);
```

```
INSERT INTO ages(name, age)VALUES('Alexandros Markodimitrakis',18);
```

```
INSERT INTO ages(name, age)VALUES('Alexandros Markodimitrakis',16);
```

```
INSERT INTO ages(name, age)VALUES('Alexandros Markodimitrakis',12);
```

```
INSERT INTO ages(name, age)VALUES('Theodoros Pontzouktzidis',25);
```

```
INSERT INTO ages(name, age)VALUES('Theodoros Pontzouktzidis',17);
```

```
INSERT INTO salary(name,main_salary,bonus) VALUES('Alexandros
Markodimitrakis',280.0,15.0);
```

```
INSERT INTO salary(name,main_salary,bonus) VALUES('Theodoros
Pontzouktzidis',30000.0,4000.0);
```

```
INSERT INTO salary(name,main_salary,bonus) VALUES('Eirini
Kostopoulou',23000.0,2000.0);
```

```
INSERT INTO salary(name,main_salary,bonus) VALUES('Giorgos Markakis',32000.0,3500.0);
```

```
INSERT INTO salary(name,main_salary,bonus) VALUES('Katerina Samara',25000.0,1500.0);
```

```
INSERT INTO payment(name,date,amount) VALUES('Alexandros
Markodimitrakis','2022-05-31',295.0);
```

```
INSERT INTO payment(name,date,amount) VALUES('Theodoros
Pontzouktzidis','2001-05-31',34000.0);
```

```
INSERT INTO payment(name,date,amount) VALUES('Eirini
Kostopoulou','2022-05-31',25300.0);
```

```
INSERT INTO payment(name,date,amount) VALUES('Giorgos
Markakis','2022-05-31',34500.0);
```

```
INSERT INTO payment(name,date,amount) VALUES('Katerina
Samara','2022-05-31',26500.0);
```

SQL Queries.

Query 1: Payroll by category of staff

SQL Query 1:

```
SELECT * FROM payment WHERE name IN (SELECT name FROM permanent
WHERE category =0);
```

Foreach payment (**IN** JAVA)

```
SELECT * FROM salary WHERE name = res);
```

Print results of above SQL query

```
SELECT * FROM payment WHERE name IN (SELECT name FROM permanent
WHERE category =1);
```

Foreach payment (**IN** JAVA)

```
SELECT * FROM salary WHERE name = res);
```

Print results of above SQL query

```
SELECT * FROM payment WHERE name IN (SELECT name FROM contracted WHERE
category =0);
```

Foreach payment (**IN** JAVA)

```
SELECT * FROM salary WHERE name = res);
```

Print results of above SQL query

```
SELECT * FROM payment WHERE name IN (SELECT name FROM contracted WHERE
category =1);
```

Foreach payment (**IN** JAVA)

```
SELECT * FROM salary WHERE name = res);
```

Print results of above SQL query

(res is each name from each entry.)

Query 2: Maximum, minimum and average salary by category of staff

SQL Queries 2:

Minimum:

```
SELECT MIN(main_salary+bonus) FROM salary WHERE name IN (SELECT name FROM permanent WHERE category=0);
```

```
SELECT MIN(main_salary+bonus) FROM salary WHERE name IN (SELECT name FROM permanent WHERE category=1);
```

```
SELECT MIN(main_salary+bonus) FROM salary WHERE name IN (SELECT name FROM contracted WHERE category=0);
```

```
SELECT MIN(main_salary+bonus) FROM salary WHERE name IN (SELECT name FROM contracted WHERE category=1);
```

Maximum:

```
SELECT MAX(main_salary+bonus) FROM salary WHERE name IN (SELECT name FROM permanent WHERE category=0);
```


```
SELECT MAX(main_salary+bonus) FROM salary WHERE name IN (SELECT name FROM permanent WHERE category=1);
```

```
SELECT MAX(main_salary+bonus) FROM salary WHERE name IN (SELECT name FROM contracted WHERE category=0);
```

```
SELECT MAX(main_salary+bonus) FROM salary WHERE name IN (SELECT name FROM contracted WHERE category=1);
```

Average:

```
SELECT AVG(main_salary+bonus) FROM salary WHERE name IN (SELECT name FROM permanent WHERE category=0);
```



```
SELECT AVG(main_salary+bonus) FROM salary WHERE name IN (SELECT name FROM permanent WHERE category=1);
```

```
SELECT AVG(main_salary+bonus) FROM salary WHERE name IN (SELECT name FROM contracted WHERE category=0);
```

```
SELECT AVG(main_salary+bonus) FROM salary WHERE name IN (SELECT name FROM contracted WHERE category=1);
```

Query 3: Data and payroll of a specific staff member

SQL Queries 3:

```
SELECT * FROM permanent WHERE name = res;
```

If above query doesn't select anything we proceed to do a select in contracted table

```
SELECT * FROM contracted WHERE name = res;
```

```
SELECT * FROM salary WHERE name = res;
```

Query 4: Total payroll by category of staff

SQL Queries 4:

```
SELECT SUM(main_salary+bonus) FROM salary WHERE name IN (SELECT name FROM permanent WHERE category=0);
```

```
SELECT SUM(main_salary+bonus) FROM salary WHERE name IN (SELECT name FROM permanent WHERE category=1);
```

```
SELECT SUM(main_salary+bonus) FROM salary WHERE name IN (SELECT name FROM contracted WHERE category=0);
```

```
SELECT SUM(main_salary+bonus) FROM salary WHERE name IN (SELECT name FROM contracted WHERE category=1);
```


Testing & Screenshots.

Add Permanent:

[add permanent](#) [add contract](#) [edit user](#) [Edit Main Salary](#) [Payments](#) [Questions](#) [Fire or Retire](#)

New Permanent

*Name

*Address

*Phone Number

*iban

*Bank Name

*Start date

*Department

*Children


*Children Ages

*Married
Yes ☒ No ☐

*Category
Administrative ☐ Educational ☒

*Years

[Add](#)



Success

Employee added successfully!

[OK](#)

Add Contracted:

[add permanent](#) [add contract](#) [edit user](#) [Edit Main Salary](#) [Payments](#) [Questions](#) [Fire or Retire](#)

New Contracted

*Name

*Address

*Phone Number

*iban

*Bank Name

*Start date

*End_date

*Department

*Children


*Children Ages

*Married
Yes ☐
No ☒

*Category
Administrative ☐
Educational ☒

*Main salary

[Add](#)



Success

Employee added successfully!

[OK](#)

Edit Employee:

[add permanent](#) [add contract](#) [edit user](#) [Edit Main Salary](#) [Payments](#) [Questions](#) [Fire or Retire](#)

Contract

Permanent

First Name

Georgios Mathioudakis

address

Michail Kalogirou 8

Phone

6980521212

IBAN

GR124165416515152

bank_name

National Bank

start_date

2005-05-04

Department

Physics

Children

3

ages

1,17,24

married

Married

married

Administrative

years

17

Make Payments/Show Payments/Salary statistics per Category/ Total Salary per Category:

[add permanent](#)
[add contract](#)
[edit user](#)
[Edit Main Salary](#)
[Payments](#)
[Questions](#)
[Fire or Retire](#)

Date of Payments

01/30/2023



[Make Payments](#)

[Show Payments](#)

[Salary Per Category](#)

[Total Salary Per Category](#)

Search employee...

Payments

Payments From Permanent Administrative Staff:

Payments From Permanent Educational Staff:

Name: Alexandros Markodimitrakis - Date: 2023-01-30 - Total: 3150.0€ - Main Salary: 2800.0€ - Bonus: 350.0€

Payments From Contracted Administrative Staff:

Name: Theodoros Pontzouktzidis - Date: 2023-01-30 - Total: 110000.0€ - Main Salary: 100000.0€ - Bonus: 10000.0€

Payments From Contracted Educational Staff:

Salary Per Category

Min Salary for Permanent Admins: 0€

Max Salary for Permanent Admins: 0€

Average Salary for Permanent Admins: 0€

Min Salary for Permanent Researchers: 2800€

Max Salary for Permanent Researchers: 2800€

Average Salary for Permanent Researchers: 2800€

Min Salary for Contracted Admins: 100000€

Max Salary for Contracted Admins: 100000€

Average Salary for Contracted Admins: 100000€

Min Salary for Contracted Researchers: 0€

Max Salary for Contracted Researchers: 0€

Average Salary for Contracted Researchers: 0€

Total Salary per Category

Total Salary for Permanent Admins: 0€

Total Salary for Permanent Researchers: 3150€

Total Salary for Contracted Admins: 110000€

Total Salary for Contracted Researchers: 0€

Change Salaries and Bonuses:

[add permanent](#)[add contract](#)[edit user](#)[Edit Main Salary](#)[Payments](#)[Fire or Retire](#)

Administrative Salary

[Change Salary](#)

Success

Educational Salary

[Change Salary](#)

Success

Search Bonus

[Change bonus](#)

Success

Library Bonus

[Change bonus](#)

Success

Show Employee Information/ Fire-retire employ

[add permanent](#)[add contract](#)[edit user](#)[Edit Main Salary](#)[Payments](#)[Fire or Retire](#)

Category	Value
contract	false
name	Alexandros Markodimitrakis
address	Fourtounatou 6
phone_number	6981073112
iban	GR2701121149381872825494513
bank_name	Piraeus Bank
start_date	2022-05-23
department	Programming
children	4
married	1
category	1
years	12

[Fire/Retire](#)

Comments.

Question "Average Increase" was not implemented (no time).