Department of Information Technology.

Data base mini project:

JUH system: Jordan University Hospital system.

Supervisor: Dr. Marwan Al-Tawil

Group members:

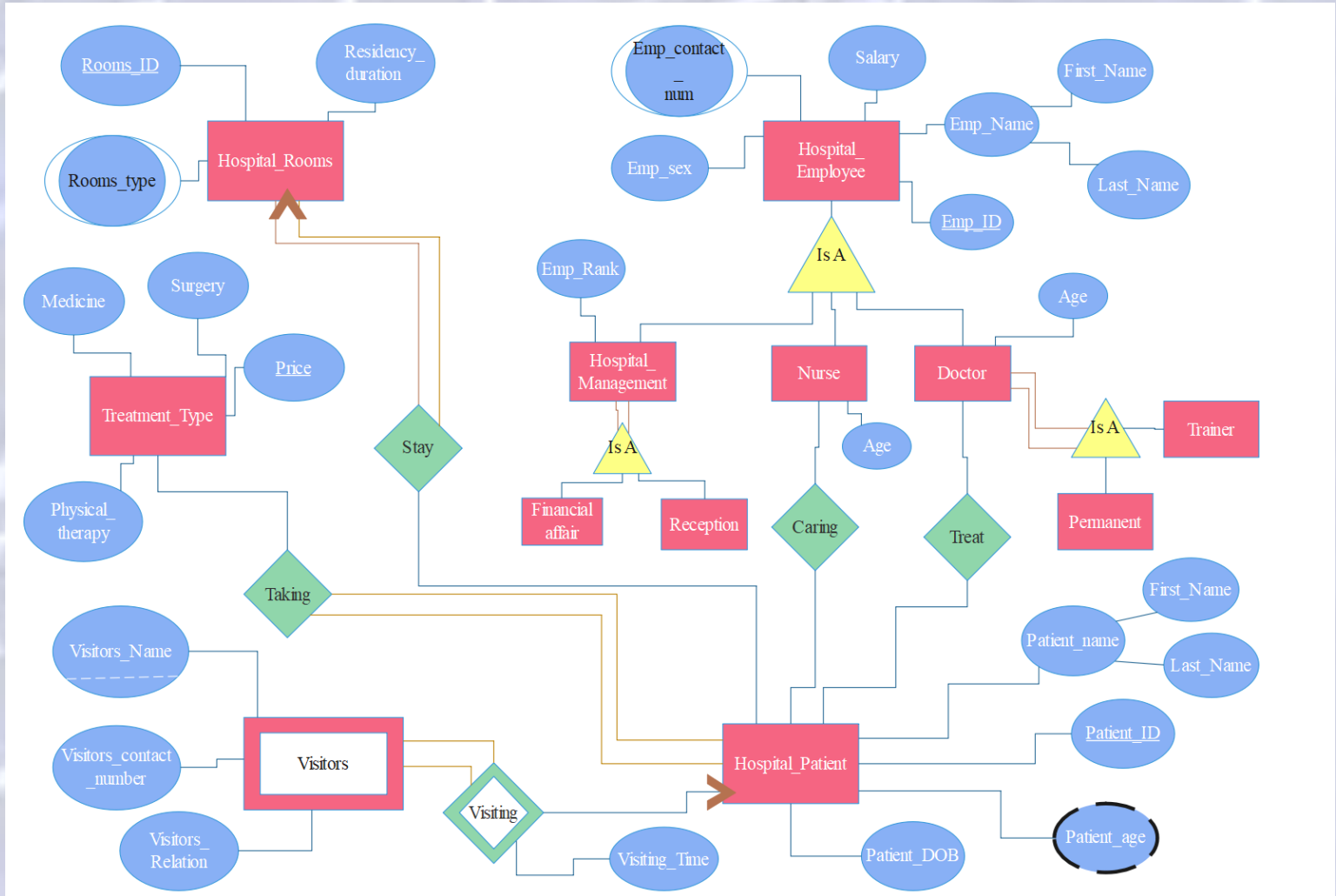| Student Name	Student ID
Tamara Maher El-Heet "Team Leader"	0186363
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➢ **Brief Description and Problem Definition:**

Our project is a database system that includes the overall management system of Jordan University Hospital, including their medical units, medical Departments, patients and staff info as well.

The reason of why we chose this problem is because of the importance of hospitals role in our lives, and because it is an interesting problem. People who will care about our mini project are the doctors, hospital management staff, and obviously the patients since this group of people will benefit from it.

➢ **Work planning:**

We made an online meeting using Microsoft teams in order to discuss about the whole project. We give our ideas and then we came up with the JUH system as a final topic to our project. We then divide the tasks and started on working as we planned.

ER-Diagram:

➢ ER-D Mapping:

Hospital_ Patient
(Patient -
ID(PK), First _Name ,Last _Name, Patient _DOB ,Rooms _ID(FK)).

Visitors
(Patient _ID(PK)(FK), Visitor _Name (PK), Visitors _contact _number, Visitors _Relation,
Visiting _Time).

Treatment _Type
(Price (PK), Surgery, Medicine, Physical _therapy).

Taking _Care (Patient-ID(PK), Price (PK)).

Hospital _Rooms (Rooms-ID(PK), Residency _duration).

Hospital _Rooms _Type (Rooms-ID (PK), Rooms-Type (PK)).

Hospital _Employee (Emp-ID(PK), First _Name, Last _Name, Salary ,Emp _sex).

Hospital _Employee _Emp _contact _num (Emp-ID(PK), Emp-contact -num(PK)).

Hospital _Management (<u>Emp -ID(PK)</u>, First _Name, Last _Name, Salary ,Emp _sex, Emp _Rank).

Financial _affair (<u>Emp -ID(PK)</u>, Emp _Rank, First _Name, Last _Name, Salary ,Emp _sex);

Reception (<u>Emp -ID(PK)</u>, Emp _Rank, First _Name, Last _Name, Salary ,Emp _sex);

Nurse (<u>Emp-ID(PK)</u>, First _Name, Last _Name, Salary ,Emp _sex, Age).

Doctor
(<u>Emp-ID(PK)</u>, First _Name, Last _Name, Salary ,Emp _sex, Age).

Trainer(<u>Emp-ID(PK)</u>, First _Name, Last _Name, Salary ,Emp _sex, Age);

Permanent (<u>Emp-ID(PK)</u>, First _Name, Last _Name, Salary ,Emp _sex, Age);

Caring _For (<u>Patient-ID(PK)</u>, <u>Emp-ID(PK)</u>).

Treating (<u>Patient-ID(PK)</u>, <u>Emp-ID(PK)</u>).

DDL statements:

```sql
create table Hospital_Rooms(
Rooms_ID char(8) not null,
Residency_duration varchar(11),
primary key (Rooms_ID) );

create table Hospital_Patient (
Patient_ID char(7) not null,
First_Name varchar(10),
Last_Name varchar(10),
Patient_DOB date,
Rooms_ID char(8),
primary key (Patient_ID),
foreign key (Rooms_ID) references Hospital_Rooms (Rooms_ID) );

create table Hospital_Rooms_Type (
Rooms_ID char(8) not null,
Rooms_Type varchar(20) not null,
primary key (Rooms_ID,Rooms_Type),
foreign key (Rooms_ID) references Hospital_Rooms (Rooms_ID) );

create table Treatment_Type(
Price numeric(8,2) not null,
Surgery varchar(15),
Medicine varchar(25),
Physical_therapy varchar(18),
primary key (Price) );

create table Taking_Care (
Patient_ID char(7) not null,
Price numeric(8,2) not null,
primary key (Patient_ID, Price),
foreign key (Patient_ID) references Hospital_Patient (Patient_ID),
foreign key (Price) references Treatment_Type (Price) );
```

```sql
create table Visitors(
Patient_ID char(7) not null,
Visitor_Name varchar(24) not null,
Visitors_contact_number char(11),
Visitors_Relation varchar(12),
Visiting_Time datetime,
primary key (Patient_ID,Visitor_Name),
foreign key (Patient_ID) references Hospital_Patient (Patient_ID) );

create table Hospital_Employee(
Emp_ID char(7) not null,
First_Name varchar(10),
Last_Name varchar(10),
Salary numeric(8,2),
Emp_sex varchar(7),
primary key (Emp_ID) );

create table Hospital_Employee_Emp_contact_num(
Emp_ID char(7) not null,
Emp_contact_num char(11) not null,
primary key (Emp_ID, Emp_contact_num),
foreign key (Emp_ID) references Hospital_Employee (Emp_ID) );

create table Hospital_Management(
Emp_ID char(7) not null,
First_Name varchar(10),
Last_Name varchar(10),
Salary numeric(8,2),
Emp_sex varchar(7),
Emp_Rank varchar(30),
primary key (Emp_ID) );

create table Financial_affair(
Emp_ID char(7) not null,
```

```sql
First_Name varchar(10),
Last_Name varchar(10),
Salary numeric(8,2),
Emp_sex varchar(7),
Emp_Rank varchar(30),
primary key (Emp_ID) );

create table Reception(
Emp_ID char(7) not null,
First_Name varchar(10),
Last_Name varchar(10),
Salary numeric(8,2),
Emp_sex varchar(7),
Emp_Rank varchar(30),
primary key (Emp_ID) );

create table Nurse(
Emp_ID char(7) not null,
First_Name varchar(10),
Last_Name varchar(10),
Salary numeric(8,2),
Emp_sex varchar(7),
Age char(3),
primary key (Emp_ID) );

create table Doctor (
Emp_ID char(7) not null,
First_Name varchar(10),
Last_Name varchar(10),
Salary numeric(8,2),
Emp_sex varchar(7),
Age char(3),
primary key (Emp_ID) );
```

```sql
create table Trainer(
Emp_ID char(7) not null,
First_Name varchar(10),
Last_Name varchar(10),
Salary numeric(8,2),
Emp_sex varchar(7),
Age char(3),
primary key (Emp_ID) );

create table Permanent(
Emp_ID char(7) not null,
First_Name varchar(10),
Last_Name varchar(10),
Salary numeric(8,2),
Emp_sex varchar(7),
Age char(3),
primary key (Emp_ID) );

create table Caring_For (
Patient_ID char(7) not null,
Emp_ID char(7) not null,
primary key (Patient_ID, Emp_ID),
foreign key (Patient_ID) references Hospital_Patient (Patient_ID),
foreign key (Emp_ID) references Hospital_Employee (Emp_ID) );

create table Treating (
Patient_ID char(7) not null,
Emp_ID char(7) not null,
primary key (Patient_ID, Emp_ID),
foreign key (Patient_ID) references Hospital_Patient (Patient_ID),
foreign key (Emp_ID) references Hospital_Employee (Emp_ID) );
```

➢ DML statements:

insert into Hospital_Rooms (Rooms_ID,Residency_duration) values ('120','24');

insert into Hospital_Rooms (Rooms_ID,Residency_duration) values ('121','12');

insert into Hospital_Patient (Patient_ID,First_Name,Last_Name,Patient_DOB,Rooms_ID) values ('100123','sara','khaled','2000-12-1','120');

insert into Hospital_Patient (Patient_ID,First_Name,Last_Name,Patient_DOB,Rooms_ID) values ('100124','tia','zaid','2018-7-9','121');

insert into Hospital_Rooms_Type (Rooms_ID ,Rooms_Type) values ('120','Suite');

insert into Hospital_Rooms_Type (Rooms_ID ,Rooms_Type) values ('121','Deluxe ');

insert into Treatment_Type (Price,Surgery,Medicine,Physical_therapy) values (1000.0,'pelvic fracture','LIRICA','YES');

insert into Treatment_Type (Price,Surgery,Medicine,Physical_therapy) values (50.5,'NO','VITAMIN C','NO');

insert into Taking_Care (Patient_ID,Price) values ('100123',1000.0);

insert into Taking_Care (Patient_ID,Price) values ('100124',50.5);

insert into Visitors
(Patient_ID,Visitor_Name,Visitors_contact_number,Visitors_Relation,Visiting_Time) values ('100123','Ali','0779362975','Brother','2020-12-12 1:36:14');

insert into Visitors
(Patient_ID,Visitor_Name,Visitors_contact_number,Visitors_Relation,Visiting_Time) values ('100124','Omar','0799332575','Brother','2020-12-12 1:40:58');

insert into
Hospital_Employee(Emp_ID,First_Name,Last_Name,Salary,Emp_sex) values ('200145','Sia','Ahmad',1000.0,'Female');

insert into
Hospital_Employee(Emp_ID,First_Name,Last_Name,Salary,Emp_sex) values ('200146','Saleh','Ahmad',250,'Male');

insert into
Hospital_Employee_Emp_contact_num(Emp_ID,Emp_contact_num) values ('200145','0779542876');

insert into
Hospital_Employee_Emp_contact_num(Emp_ID,Emp_contact_num) values ('200146','0795026765');

insert into Hospital_Management
(Emp_ID,First_Name,Last_Name,Salary,Emp_sex,Emp_Rank) values ('219076','Raed','khattab',1000,'Male','Hospital Administrator');

insert into Hospital_Management
(Emp_ID,First_Name,Last_Name,Salary,Emp_sex,Emp_Rank) values ('219077','Rawan','Ahmad',2000.5,'Female','Dean Of the Hospital');

```sql
insert into Financial_affair
(Emp_ID,First_Name,Last_Name,Salary,Emp_sex,Emp_Rank) values
('56758','Alia','Rakan',450.6,'Female','Tax Specialist');

insert into Financial_affair
(Emp_ID,First_Name,Last_Name,Salary,Emp_sex,Emp_Rank) values
('56759','Samer','suaad',500.0,'Male','Budget Manager');


insert into Reception
(Emp_ID,First_Name,Last_Name,Salary,Emp_sex,Emp_Rank) values
('6743','Sera','Ash',300.0,'Female','Reception trainer');

insert into Reception
(Emp_ID,First_Name,Last_Name,Salary,Emp_sex,Emp_Rank) values
('6744','Naya','Yanal',300.0,'Female','Regular Receptionist');


insert into Nurse (Emp_ID,First_Name,Last_Name,Salary,Emp_sex,Age)
values ('9876','Tara','Murad',500.0,'Female','26');

insert into Nurse (Emp_ID,First_Name,Last_Name,Salary,Emp_sex,Age)
values ('9875','Bayan','Murad',500.0,'Female','31');


insert into Doctor(Emp_ID,First_Name,Last_Name,Salary,Emp_sex,Age)
values ('3892','Natalie','Khaled',2000.0,'Female','34');

insert into Doctor(Emp_ID,First_Name,Last_Name,Salary,Emp_sex,Age)
values ('3872','Afnan','Ali',2000.4,'Female','36');


insert into Trainer(Emp_ID,First_Name,Last_Name,Salary,Emp_sex,Age)
values ('3872','Tamara','samer',800,'Female','25');

insert into Trainer(Emp_ID,First_Name,Last_Name,Salary,Emp_sex,Age)
values ('3862','Dana','ghazal',800,'Female','25');
```

insert into Permanent(Emp_ID,First_Name,Last_Name,Salary,Emp_sex,Age)
values ('3862','Rawan','ahamd',600,'Female','27');

insert into Permanent(Emp_ID,First_Name,Last_Name,Salary,Emp_sex,Age)
values ('3882','Zaid','khaled',600,'Male','27');

insert into Caring_For(Patient_ID,Emp_ID) values ('100123','200145');

insert into Caring_For(Patient_ID,Emp_ID) values ('100124','200146');

insert into Treating(Patient_ID,Emp_ID) values('100123','200145');

insert into Treating(Patient_ID,Emp_ID) values ('100124','200146')

➢ **SQL statement:**
select count (Patient_ID)
from Hospital_Patient;

select Visitors.Visitor_Name , Hospital_Patient.First_Name
from Visitors Inner Join Hospital_Patient
on Visitors.Patient_ID = Hospital_Patient.Patient_ID;

➢ **Conclusion and references:**

We were able to apply almost everything we learned in this course in our project and the results that we ended with were satisfying. Our project included many aspects such as the Hospital employees, doctors, departments and patients.

For the references:

We used the MySQL workbench 8.0 CE,Wondershare EdrawMax, Java and Eclipse IDE to get the work done, We also used

http://hospital.ju.edu.jo/medical/juhospital/Home.aspx to get the information that we used in building the whole project.

➢ **Tables of data:**

Select*from Hospital_Rooms;

Rooms_ID	Residency_duration
120	24
121	12

Select*from Hospital_Rooms_Type;

	Rooms_ID	Rooms_Type
▶	120	Suite
	121	Deluxe

Select*from Treatment_Type;

	Price	Surgery	Medicine	Physical_therapy
▶	50.50	NO	VITAMIN C	NO
	1000.00	pelvic fracture	LIRICA	YES

Select*from Hospital_Employee;

	Emp_ID	First_Name	Last_Name	Salary	Emp_sex
▶	200145	Sia	Ahmad	1000.00	Female
	200146	Saleh	Ahmad	250.00	Male

Select*from Financial_affair;

	Emp_ID	First_Name	Last_Name	Salary	Emp_sex	Emp_Rank
▶	56758	Alia	Rakan	450.60	Female	Tax Specialist
	56759	Samer	suaad	500.00	Male	Budget Manager

Select*from Nurse;

Emp_ID	First_Name	Last_Name	Salary	Emp_sex	Age
▶ 9875	Bayan	Murad	500.00	Female	31
9876	Tara	Murad	500.00	Female	26

Select*from Caring_For;

Patient_ID	Emp_ID
▶ 100123	200145
100124	200146

Select*from Treating;

Patient_ID	Emp_ID
▶ 100123	200145
100124	200146

Select*from Hospital_Patient;

Patient_ID	First_Name	Last_Name	Patient_DOB	Rooms_ID
▶ 100123	sara	khaled	2000-12-01	120
100124	tia	zaid	2018-07-09	121
* NULL	NULL	NULL	NULL	NULL

Select*from Taking_Care;

Patient_ID	Price
100124	50.50
100123	1000.00
NULL	NULL

Select*from Visitors;

Patient_ID	Visitor_Name	Visitors_contact_number	Visitors_Relation	Visiting_Time
100123	Ali	0779362975	Brother	2020-12-12 01:36:14
100124	Omar	0799332575	Brother	2020-12-12 01:40:58
NULL	NULL	NULL	NULL	NULL

Select*from Hospital_Employee_Emp_contact_num;

Emp_ID	Emp_contact_num
200145	0779542876
200146	0795026765
NULL	NULL

Select*from Hospital_Management;

Emp_ID	First_Name	Last_Name	Salary	Emp_sex	Emp_Rank
219076	Raed	khattab	1000.00	Male	Hospital Administrator
219077	Rawan	Ahmad	2000.50	Female	Dean Of the Hospital
NULL	NULL	NULL	NULL	NULL	NULL

Select*from Reception;

Emp_ID	First_Name	Last_Name	Salary	Emp_sex	Emp_Rank
6743	Sera	Ash	300.00	Female	Reception trainer
6744	Naya	Yanal	300.00	Female	Regular Receptionist
NULL	NULL	NULL	NULL	NULL	NULL

Select*from Doctor;

Emp_ID	First_Name	Last_Name	Salary	Emp_sex	Age
3872	Afnan	Ali	2000.40	Female	36
3892	Natalie	Khaled	2000.00	Female	34
NULL	NULL	NULL	NULL	NULL	NULL

Select*from Trainer;

Emp_ID	First_Name	Last_Name	Salary	Emp_sex	Age
3862	Dana	ghazal	800.00	Female	25
3872	Tamara	samer	800.00	Female	25
NULL	NULL	NULL	NULL	NULL	NULL

Select*from Permanent;

Emp_ID	First_Name	Last_Name	Salary	Emp_sex	Age
3862	Rawan	ahamd	600.00	Female	27
3882	Zaid	khaled	600.00	Male	27
NULL	NULL	NULL	NULL	NULL	NULL

➤ Linking to a programming language "Java" :

```java
MyMain.java        HospitalHandler.java ⊠
 1⊝ import java.io.EOFException;
 2  import java.io.IOException;
 3  import java.io.RandomAccessFile;
 4  import java.sql.Connection;
 5  import java.sql.DriverManager;
 6  import java.sql.ResultSet;
 7  import java.sql.SQLException;
 8  import java.sql.Statement;
 9
10  public class HospitalHandler {
11      String dbUrl = "jdbc:mysql://localhost:3306/sys";//Database URL
12      String dbClass = "com.mysql.jdbc.Driver";//JDBC driver name
13
14      Connection con;
15      Statement stat;
16      String query;
17
18⊝     public void connect(){
19          System.out.println("connect()...");
20          try {
21              Class.forName(dbClass).newInstance();
22              con = DriverManager.getConnection(dbUrl, "root",      ");        ← Our password
23              stat = con.createStatement();
24          } catch (SQLException e) {
25              e.printStackTrace();
26          } catch (Exception e) {
27              e.printStackTrace();
28          }
29      }
```

Sales DataBase

TimeKey
CustomerKey
ShipperKey
ProductKey
EmployeeKey
ItemFreight
ItemQuantity
ItemAll
Discount

```java
30
31⊖    public void disconnect() {
32         System.out.println("disconnect()...");
33         try {
34             if (!(con.isClosed())) {
35                 con.close();
36             }
37         } catch (Exception e) {
38             e.printStackTrace();
39         }
40     }
41
42⊖    public void ReadPatient() {
43         System.out.println("ReadPatient()... ");
44         String patients = "";
45         try {
46             connect();
47             query = "SELECT * FROM Hospital_Patient ";
48             ResultSet rs = stat.executeQuery(query);
49             while (rs.next()) {
50                 patients += rs.getObject(1).toString() + " ";
51                 patients += rs.getObject(2).toString() + " ";
52             }
53             System.out.println("rs.next()..."+rs.next());
54             System.out.println(patients);
55         }catch (Exception e) {
56             e.printStackTrace();
57         }
58         disconnect();
59     }
60
61⊖    public void insertPatient() {
```

```java
55          }catch (Exception e) {
56              e.printStackTrace();
57          }
58          disconnect();
59      }
60
61      public void insertPatient(){
62          System.out.println("insertPatient()...");
63          try{
64              connect();
65              query = "insert into patient values('100153','Hala','Sami','2000-12-1','120'
66              stat.executeUpdate(query);
67
68          }catch (Exception e) {
69              e.printStackTrace();
70          }
71      }
72
73      public void deletePatient(){
74          System.out.println("insertPatient()...");
75          try{
76              connect();
77              query = "delete from patient where Patient_ID = '100153'";
78              stat.executeUpdate(query);
79          }catch (Exception e) {
80              e.printStackTrace();
81          }
82      }
83
84  }
85
```

```java
MyMain.java ⊠    HospitalHandler.java
 1
 2   public class MyMain {
 3
 4⊖       public static void main(String[] args) {
 5           HospitalHandler ah = new HospitalHandler();
 6           ah.ReadPatient();
 7           ah.insertPatient();
 8           ah.deletePatient();
 9           ah.ReadPatient();
10
11       }
12
13   }
14
```