



**King Saud University**  
**College of Computer and Information Sciences**  
**Department of Information Technology**

**IT222: Database Principles**  
2<sup>nd</sup> Semester 1445 H



## **Ehsan Database**

### **Phase # 1**

Section #	NAME	ID
View Name: <i>Donor</i>		
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## Project Description:

*The proposed database application is an Online Donation Management System. The client for this system is Ehsan platform seeking to streamline and manage the donation process efficiently. The system will facilitate various activities, including accepting online donations, tracking donor information, and ensuring transparency and accountability in the donation process.*

## View Description:

*In this view, the donor is interested in managing donor information, tracking donation history. The focus is on maintaining a database of donors, their contact information, donation amounts, donation frequency, and any associated notes or preferences.*

## Data Requirements:

### 1. Entity: Donor

*Description: Stores information about donors, including donor ID (PK), name, email, phone number.*

*Relation: Donor donate to multiple institutions (one-to-many).*

### 2. Entity: Recipient

*Description: Records details of individuals or groups who are the recipients of donations, including recipient ID (PK), name, contact information.*

*Relation: Many recipients can be supported by multiple institutions (many-to-many).*

### 3. Entity: Institution

*Description: Stores information about institutions involved in the donation platform, including institution ID (PK), name, and contact information, Each donor must donate to either financial or non financial donation institution or both.*

*Relation: An institution can have multiple donors (one-to-many), And supports multiple recipients ( one-to-many).*

### 4. Entity: Financial donation institution.

*- Description: Represents a sub-entity of the Institution entity, specifically for financial donations.*

*- Attributes: donated amount and payment method*

*.*

### 5. Entity: non-financial donation institution.

*Description: Represents a sub-entity of the Institution entity, specifically for non-financial donations, such as clothes donation, food donations and blood donations etc.*

*attributes: institution type(clothes donation), and the donated item (dress).*

### 6. Relationship Attribute: Donation

*Description: Records details of each donation, including donation date, receipt.*

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*Relation: Occurs when there's a relation between a donor and an institution.*

### **Transaction Requirements:**

#### **Data Entry:**

- a) Enter details of a new donor such as (abc678910, Ahmed khalid, 123-456-789, Ahmed@email.com)*
- b) Enter donation details such as ('lmn456789', 'qwe654321', 2024-04-20, '987123654')*

#### **Data update/deletion:**

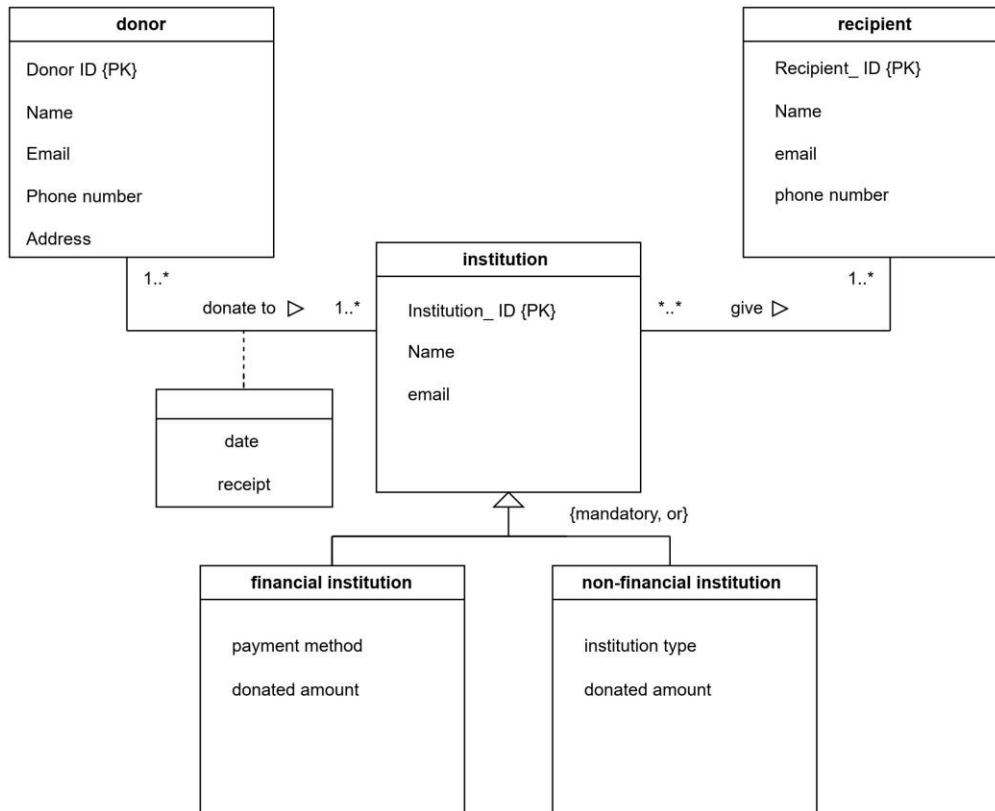
- a) Update/Delete Phone Number.*
- b) Update/Delete Email Address.*
- c) Update/Delete Payment Method.*

#### **Data Queries:**

- a) Retrieve all donations made by donors, including the donor's name, institution name, and donation date*
- b) Retrieve all recipients and the financial institutions supporting them*
- c) Retrieve the total donated amount to each financial institution*
- d) Retrieve all recipient information*
- e) Retrieve the total number of financial donation institutions*
- f) Retrieve all non-financial institutions and their supported items*
- g) Retrieve all donor information.*
- h) Display when the Last donation was at.*
- i) Display the type of recipients (Citizen/resident).*
- j) Identify the city of the institution.*

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**Global enhanced entity relationship diagram (EER):**



### **Relational Schema:**

*Map the Global EER to a relational schema and identify the Primary key and Foreign keys.*

**Donor : donor ID , name ,email ,phone number address**

**Primary key : donor ID**

**Donates to : donor ID , institution ID , date , receipt**

**Primary key: donor ID , institution ID**

**Foreign key: donor ID references donor(donor ID)**

**Foreign key: institution ID references Financial donation institution(  
institution ID)**

**Recipient : recipient ID , name, email , phone number**

**Primary key: recipient ID**

**give : institution ID , recipient ID**

**Foreign key: institution ID references Financial donation institution(  
institution ID)**

**Foreign key: recipient ID references recipient(recipient ID)**

**Financial donation institution: institution ID, email , name payment method,  
donated amount**

**Primary key: institution ID**

**Non-financial donation institution : institution ID , email , name , institution  
type ,donated item**

**Primary key: institution ID**

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**Data Dictionary showing description of all entities:**

Entity Name	Description	Occurrence
Donor	The entity that provides donations	Each donor can donate 1 or many times to the institution
Recipient	Records details of individuals or groups who are the recipients of donations	Many recipients can be supported by multiple institutions (many-to-many)
Institution	The organization facilitating the donation process each donor must donate to either a financial or non-financial donation institution	An institution can have multiple donors (one-to-many) and supports multiple recipients (one-to-many)
Financial Institution	Represents a sub-entity of the Institution entity, specifically for financial donations	N/A (Sub-entity of Institution)
Non-Financial Institution	Represents a sub-entity of the Institution entity, specifically for non-financial donations, such as clothes donation, food donations, and blood donations, etc financial transactions	N/A (Sub-entity of Institution)

**Data Dictionary showing description of all relationships:**

Entity Name	Multiplicity	Relationship	Entity Name	Multiplicity
Donor	1..*	Donate	Institution	1..*
Institution	*..*	Support	Recipient	1..*

**Data Dictionary showing description of all attributes:**

Entity Name	Attribute	Description	Data Type	Length	Nulls	Multi-Valued	Default Value	Range	PK
Donor	Donor ID	Uniquely identifies a donor	Char	9	No	No	null	No	Yes
	Name	Name of the donor	VarChar	15	No	No	null	No	No
	Email	The email of the donor	VarChar	30	No	No	null	No	No
	Phone number	The phone number of the donor	Char	10	No	No	null	No	No
	Address	The address of the donor	VarChar	30	Yes	Yes	null	No	No
	Date	The date of when the donation was made	Date	32	No	No	null	No	No
	Receipt	Contains information related to the donation	Char	9	No	No	null	No	No

Entity Name	Attribute	Description	Data Type	Length	Nulls	Multi-Valued	Default Value	Range	PK
Institution	Institution_ID	unique identifier for each institution	Char	9	No	No	Null	No	yes
	Name	The name of the institution	VarChar	15	No	No	Null	No	No
	Email	The email of the institution	VarChar	30	No	Yes	Null	No	No

Entity Name	Attribute	Description	Data Type	Length	Nulls	Multi-Valued	Default Value	Range	PK
Financial Institution	Payment Method	Method of payment used by the donor for donation	VarChar		No	No	Apple Pay	No	No
	Donated amount	The amount of money that donated by the donor	Integer	7	No	No	10	10-100000 0	No



Entity Name	Attribute	Description	Data Type	Length	Nulls	Multi-Valued	Default Value	Range	PK
Non-Financial Institution	Institution type	the kind of donation that the institution receive	VarChar	30	No	No	Null	No	No
	Donated item	the specific item donated for institution	VarChar	30	No	No	Null	No	No

Entity Name	Attribute	Description	Data Type	Length	Nulls	Multi-Valued	Default Value	Range	PK
Recipient	Recipient id	uniquely identifier for each recipient	Char	9	No	No	Null	No	Yes
	Name	The name of the recipient	VarChar	15	No	No	Null	No	No
	Email	The email of the recipient	VarChar	30	No	No	Null	No	No
	Phone number	the contact phone number of the recipient	Char	10	No	No	Null	No	No

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## DB tables creation commands:

```
CREATE TABLE Donor (  
    ID CHAR(9) PRIMARY KEY,  
    Name VARCHAR(50),  
    Phone_Number VARCHAR(15),  
    Email VARCHAR(50),  
    Address VARCHAR(100)  
);  
  
CREATE TABLE Recipient (  
    ID CHAR(9) PRIMARY KEY,  
    Name VARCHAR(50),  
    Phone_Number VARCHAR(15),  
    Email VARCHAR(50)  
);  
  
CREATE TABLE Financial_Institution (  
    ID CHAR(9) PRIMARY KEY,  
    Name VARCHAR(50),  
    Email VARCHAR(50),  
    Donated_Amount DECIMAL(10, 2),  
    Payment_Method VARCHAR(50)  
);  
  
CREATE TABLE Non_Financial_Institution (  
    ID CHAR(9) PRIMARY KEY,  
    Name VARCHAR(50),  
    Email VARCHAR(50),  
    Institution_Type VARCHAR(50),  
    Institution_item VARCHAR(50)  
);  
  
CREATE TABLE Donates(  
    Donor_ID CHAR(9),  
    Institution_ID CHAR(9),  
    donation_date date,  
    Receipt VARCHAR(50),  
    PRIMARY KEY (Donor_ID, Institution_ID),  
    Foreign key (Donor_ID) references Donor(ID),  
    Foreign key (institution_ID) references Non_Financial_Institution(ID) );
```

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```
CREATE TABLE Support (  
    Recipient_ID CHAR(9),  
    Institution_ID CHAR(9),  
    PRIMARY KEY (Recipient_ID, Institution_ID),  
    Foreign key (Recipient_ID) references Recipient(ID),  
    Foreign key (institution_ID) references Financial_Institution (ID) );
```

### Data insertion commands:

```
INSERT INTO Donor (ID, Name, Phone_Number, Email, Address)  
VALUES  
( 'abc678910', 'Ahmed Khalid', '123-456-789', 'Ahmed@email.com', '123 Main Street'),  
( 'def065167', 'Noura fahad', '987-654-321', 'Noura.fa@email.com', '456 Nahdah Street'),  
( 'ghi954310', 'Abdullah saad', '111-222-333', 'abdu.sa@emaile.com', '789 abu baker Street'),  
( 'jkl422010', 'Lulu othman', '444-555-666', 'Lulu@email.com', '987 king saud Street');
```

```
INSERT INTO Recipient (ID, Name, Phone_Number, Email)  
VALUES  
( 'mno892646', 'Lara Mohammed', '555-123-4567', 'Lara@email.com'),  
( 'pqr728350', 'Saad hamad', '777-987-6543', 'Saad.ha@email.com'),  
( 'stu386502', 'Felwa saud', '999-888-7777', 'Felwa@email.com'),  
( 'vwx704590', 'anas turki', '333-222-1111', 'Anas@email.com');
```

```
INSERT INTO Financial_Institution  
VALUES ('fin945030', 'Community Center', 'community@email.com', 1000, 'Apple Pay'),  
( 'fin561068', 'Animal Shelter', 'shelter@email.com', 5500, 'Credit Card');
```

```
INSERT INTO Non_Financial_Institution  
VALUES  
( 'nfi958756', 'Healthcare Organization', 'info@charityfoundation.com', 'Blood donation', 'B+ Blood'),  
( 'nfi660324', 'Education Fund', 'contact@educationfund.org', 'School supplies', 'pencils'),  
( 'nfi392839', 'Research Institute', 'Research@email.com', 'equipment', 'Microscope');
```

```
INSERT INTO Donates (Donor_ID, Institution_ID, Donation_Date, Receipt) VALUES  
( 'abc678910', 'nfi958756', '2024-04-30', 'ABC123'),  
( 'ghi954310', 'nfi958756', '2024-04-29', 'XYZ456');
```

```
INSERT INTO Support (Recipient_ID, Institution_ID) VALUES  
( 'mno892646', 'fin945030'),  
( 'stu386502', 'fin561068');
```

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### Data Queries commands and outputs:

1. Retrieve all donations made by donors, including the donor's name, institution name, and donation date.

Sql:

```
SELECT d.Name AS Donor_Name, i.Name AS Institution_Name, Donation_Date
FROM Donor d
JOIN Donates dt ON d.ID = dt.Donor_ID
JOIN Non_Financial_Institution i ON dt.Institution_ID = i.ID;
```

donor_name	institution_name	donation_date
Ahmed Khalid	Education Fund	2024-04-30T00:00:00.000Z
Noura fahad	Healthcare Organization	2024-04-29T00:00:00.000Z

2. Retrieve all recipients and the financial institutions supporting them

Sql:

```
SELECT r.Name AS Recipient_Name, f.Name AS Financial_Institution_Name
FROM Recipient r
JOIN Support s ON r.ID = s.Recipient_ID
JOIN Financial_Institution f ON s.Institution_ID = f.ID;
```

recipient_name	financial_institution_name
Felwa saud	Community Center
anas turki	Animal Shelter

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3. Retrieve the total donated amount to each financial institution

Sql:

```
SELECT Name AS Financial_Institution, SUM(Donated_Amount) AS Total_Donated_Amount
FROM Financial_Institution
GROUP BY Name;
```

financial_institution	total_donated_amount
Animal Shelter	5500.00
Community Center	1000.00

4. Retrieve all recipient information

Sql:

```
SELECT *
FROM Recipient;
```

id	name	phone_number	email
1	Lara Mohammed	555-123-4567	Lara@email.com
2	Saad hamad	777-987-6543	Saad.ha@email.com
3	Felwa saud	999-888-7777	Felwa@email.com
4	anas turki	333-222-1111	Anas@email.com

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5. Retrieve the total number of financial donation institutions

Sql:

```
SELECT COUNT(*) AS Total_Financial_Institutions  
FROM Financial_Institution;
```

total_financial_institutions
2

6. Retrieve all non-financial institutions and their supported items

Sql:

```
SELECT Name, Institution_item FROM Non_Financial_Institution;
```

name	institution_item
Healthcare Organization	B+ Blood
Education Fund	pencils
Research Institute	Microscope

7. Retrieve all donor information

Sql:

```
SELECT * FROM Donor;
```

ID	Name	Phone_Number	Email	Address
1	Ahmed Khalid	123-456-789	Ahmed@email.com	123 Main Street
2	Noura fahad	987-654-321	Noura.fa@email.com	456 Nahdah Street
3	Abdullah saad	111-222-333	abdu.sa@emaile.com	789 abu baker Street
4	Lulu othman	444-555-666	Lulu@email.com	987 king saud Street

**Work Distribution:**

NAME	ID	Percentage	WORK
<i>Norah Alwasil</i>	<i>444201009</i>	<i>%25</i>	<i>Project Description Data Requirements Data Queries EER Relational Schema</i>
<i>Lama Alkhathlan</i>	<i>444200844</i>	<i>%25</i>	<i>Project Description Data Requirements Data Queries EER Data Dictionary of all attributes</i>
<i>Ruba Alshammari</i>	<i>444200470</i>	<i>%25</i>	<i>Project Description Data Requirements Data Queries EER Data Dictionary of all entities</i>
<i>Noura Almadhi</i>	<i>444200890</i>	<i>%25</i>	<i>Project Description Data Requirements Data Queries EER Data Dictionary of all relationships</i>