DEPARTMENT OF COMPUTER SCIENCES

Air University

Sprint 1

"Blood Management System"

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Submitted To:

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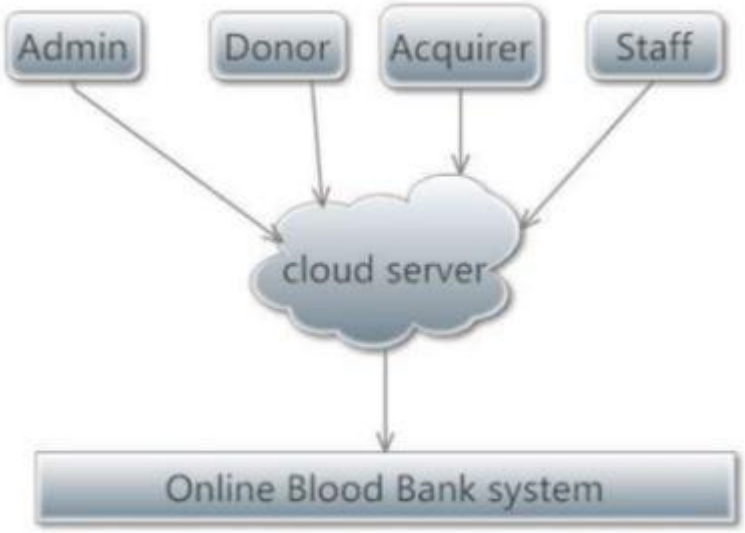
Contents:

Artitecture and Development

This section of the document will provide the details of the architecture of Blood Management System and its implementation.

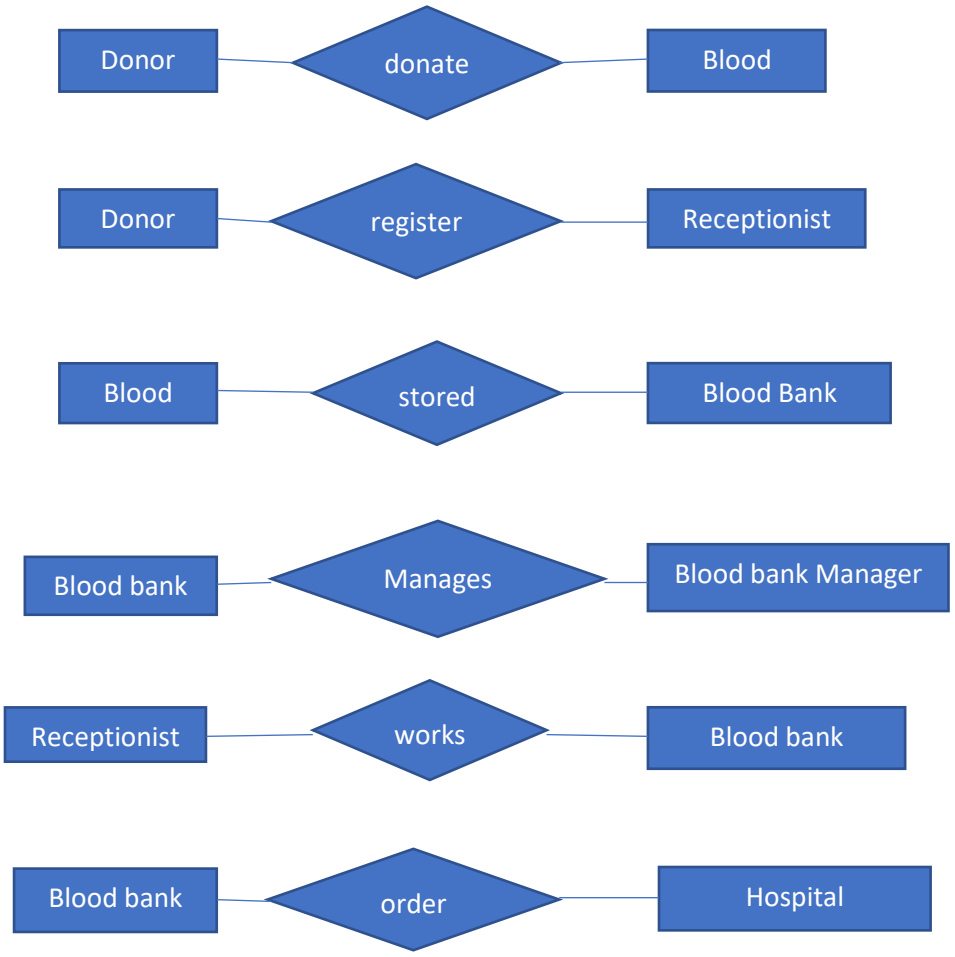
Architecture:



Entities

1. Donor
2. Blood
3. Blood Bank
4. Receptionist
5. Blood bank Manager
6. Hospital

Relationship



1.

Attributes

Donor: (Id, name, Fname, CNIC, Gender, Age, address, contact, Blood group, City, Disease, DOB, Date of donation, Donated before)

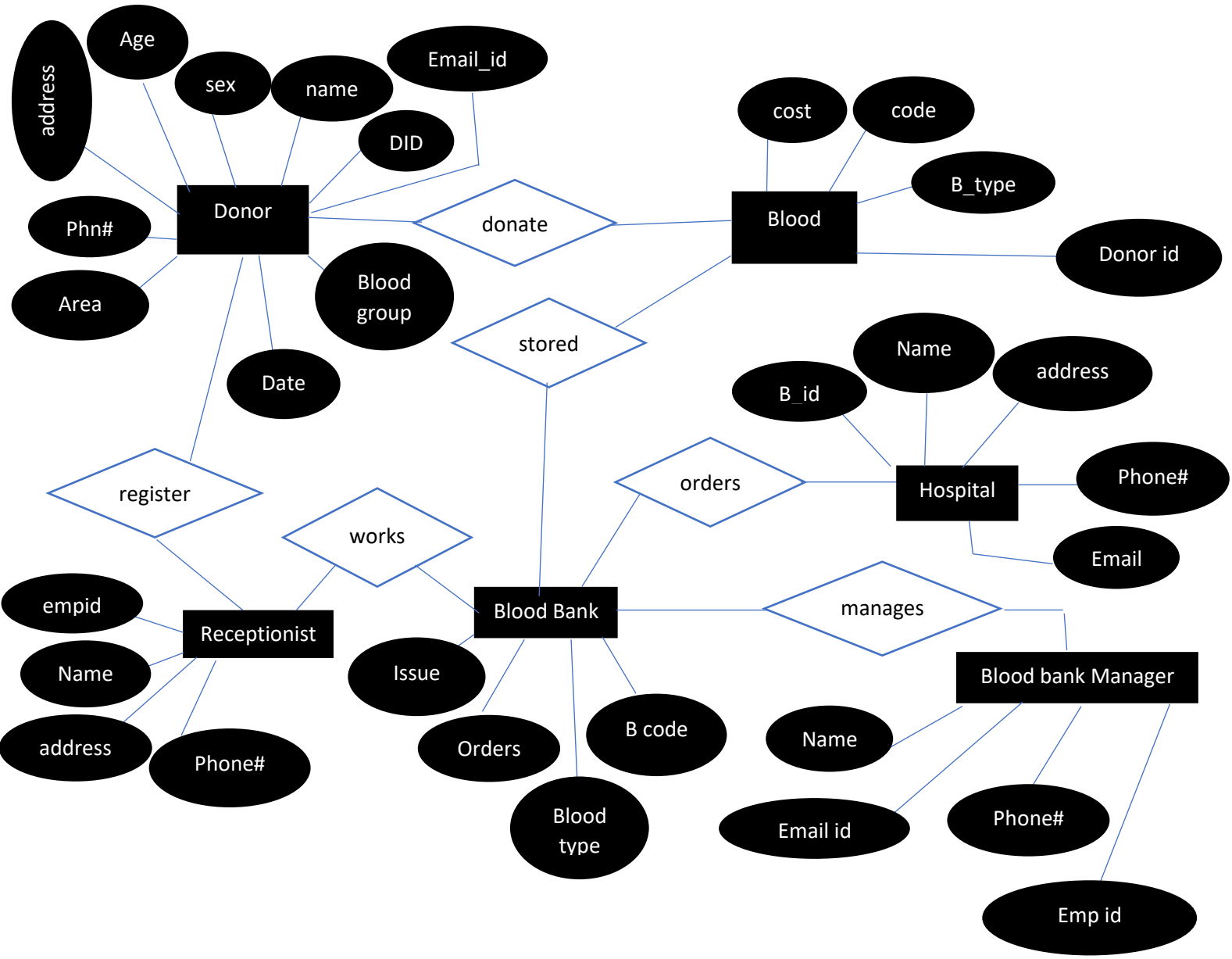
Blood: (id, Blood group, Quantity)

Receptionist: (Id, Name, Address, Contact)

Blood Bank: (Blood group, Quantity, orders)

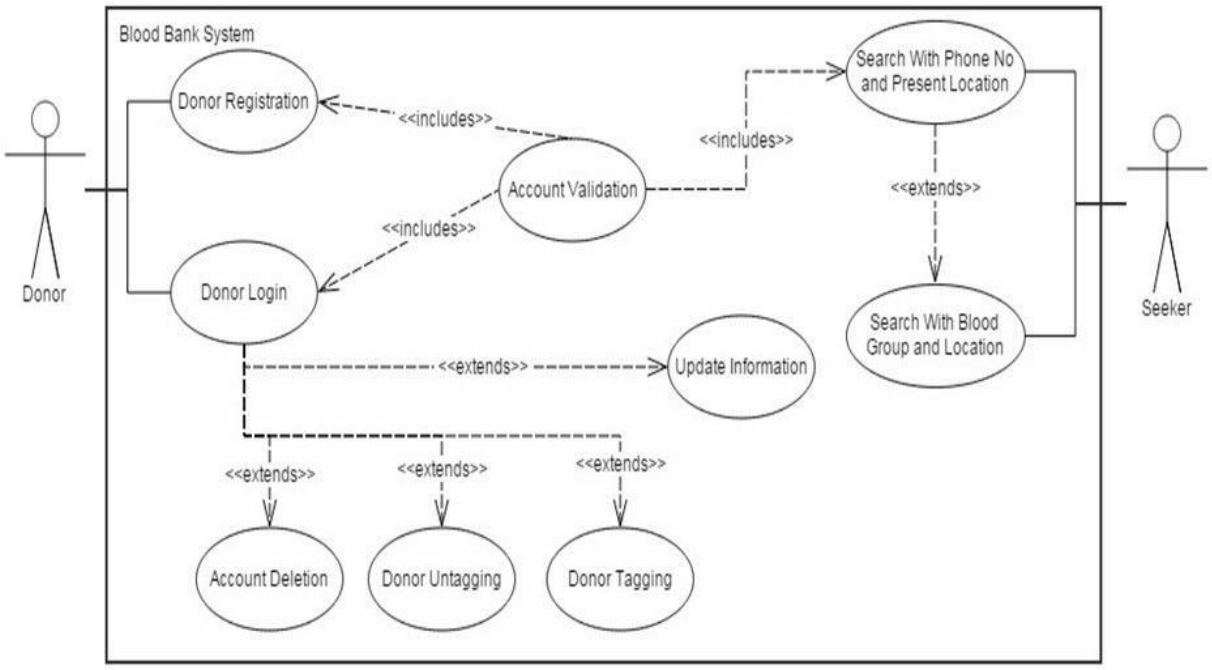
Hospital: (Id, Name, Address, Phone, Email)

Blood Bank Manager: (employee Id, Name, Phone No, Email)

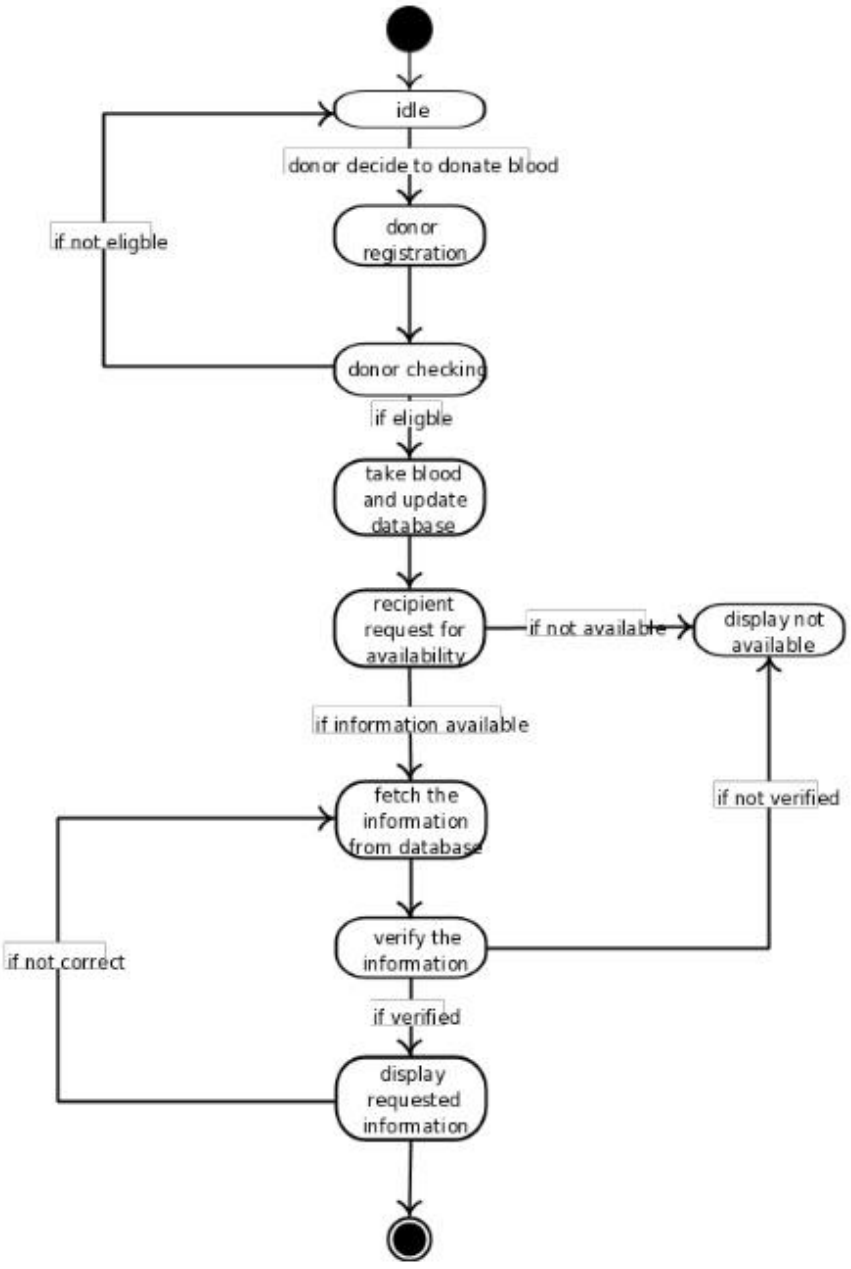


ER Model of Blood Donation System

Domain Driven Design



State Based Behaviour



Tables with Normalizaton

Donor:

1.

Column Name	Data Type	Allow Nulls
Donor_id	int	☐
D_name	varchar(50)	☑
Address	varchar(50)	☑
City	varchar(50)	☑
Gender	varchar(50)	☑
Age	varchar(50)	☑
Blood_group	varchar(50)	☑
Date_of_donation	varchar(50)	☑
Email_id	varchar(50)	☑
Disease	varchar(50)	☑
DOB	varchar(50)	☑
		☐

2.

Column Name	Data Type	Allow Nulls
Phone_no	varchar(50)	☐
Contact_name	varchar(50)	☑
		☐

Blood:

Column Name	Data Type	Allow Nulls
Blood_Id	varchar(50)	☐
Blood_group	varchar(50)	☑
Quantity	varchar(50)	☑
Donor_id	varchar(50)	☑
		☐

Receptionist:

Column Name	Data Type	Allow Nulls
Employee_id	varchar(50)	☐
Name	varchar(50)	☑
Address	varchar(50)	☑
Phone_no	varchar(50)	☑
		☐

Hospital:

Column Name	Data Type	Allow Nulls
Branch_id	int	☑
Name	varchar(50)	☑
Contact	bigint	☑
Address	varchar(50)	☑
Blood_group	varchar(50)	☑
Quantity	bigint	☑
		☐

Blood Bank:

Column Name	Data Type	Allow Nulls
Blood_group	varchar(50)	☑
Quantity	int	☑
		☐

Blood Bank Manger:

1.

Column Name	Data Type	Allow Nulls
Employee_id	varchar(50)	☐
Name	varchar(50)	☑
Phone_no	varchar(50)	☑
		☐

2.

Column Name	Data Type	Allow Nulls
Email_id	varchar(50)	☐
Name	varchar(50)	☑
Phone_no	varchar(50)	☑
		☐

Functions

A function is a piece of code or routine that accepts parameters and stored as an object in SQL Server. The function always returns a result or result set from invocation

Syntax of Function:

CREATE [OR REPLACE] FUNCTION function_name

(parameter list)

RETURN datatype

IS

BEGIN

<body>

END;

Function 1(Queries & Output): In this Function to search a name of person which donate a blood on the date of donation.

```
---Search name donate of blood
alter function search_name
(
@D_name varchar(100),
@Blood_group nvarchar(150),
@date varchar(100)
)
Returns nvarchar(450)
As
Begin
Return (+@D_name+ ' donate a Blood Group ' +@Blood_group+ ' To this date '  );
End

Select dbo.search_name (D_name,Blood_group,Date_of_donation) as Donation,Date_of_donation  from D_1
```

100 %

Results | Messages

	Donation	Date_of_donation
1	Hamza donate a Blood Group B+ To this date	12-4-2018
2	Hamza donate a Blood Group B+ To this date	12-4-2018
3	jahangir donate a Blood Group B+ To this date	12-4-2018

Function 2(Queries & Output): In this function to show the Blood group ID.

```
--Blood bank function
alter function search_blood
(
@B_id varchar(100),
@Blood_group nvarchar(150)
)
Returns nvarchar(250)
As
Begin
Return (+@B_id+ ' is the ID of this Blood group '  );
End
Select dbo.search_blood (Blood_id,Blood_type) as Blood_id, Blood_type from [dbo].[Blood bank-1]
```

100 %

Results | Messages

	Blood_id	Blood_type
1	101 is the ID of this Blood group	B+
2	102 is the ID of this Blood group	B-

Function 3(Queries & Output): To Search Quantity of every Blood group.

```
alter function search_quantity
(

@Blood_group nvarchar(150),
@Quant varchar(100)
)
Returns nvarchar(250)
As
Begin
Return ( +@Blood_group+ ' have a Quantity '   );
End
Select dbo.search_quantity (Blood_group,Quantity) as Blood_group, Quantity from [dbo].[Blood_1]
```

00 %

Results | Messages

	Blood_group	Quantity
1	B+ have a Quantity	2
2	B- have a Quantity	3

Function 4(Queries & Output): To search hospital Name with branch Id.

```
--to search Hospital name function 4
alter function search_hospital
(

@Branch_id nvarchar(150),
@name varchar(100)
)
Returns nvarchar(250)
As
Begin
Return ( 'ID: '+@Branch_id+ ' Of this Branch '   );
End
Select dbo.search_hospital (Branch_id,Name) as ID, Name from  [dbo].[hospital_1]
```

100 %

Results | Messages

	ID	Name
1	ID: 101 Of this Branch	City Hospital
2	ID: 102 Of this Branch	Azeem Hospital

Function 5(Queries & Output): To search the person which employee is manage the Blood bank.

```
--name of blood bank manage function 4
alter function search_Employee
(

@name varchar(100)
)
Returns nvarchar(100)
As
Begin
Return ( +@name+ ' manage the Blood Bank '   );
End
Select dbo.search_Employee (Name) as Name from  [dbo].[blood_manage_1]
```

100 %

Results | Messages

	Name
1	hamxa manage the Blood Bank

Stored Procedures

Donor:

Insert Donor

```
alter procedure Insert_Donor
(@Donor_id int,
@D_name varchar(50),
@Address varchar(50),
@City varchar(50),
@Gender varchar(50),
@Age varchar(50),
@Blood_group varchar(50),
@Date_of_donation varchar(50),
@Email_id varchar(50),
@Disease varchar(50),
@DOB varchar(50))

AS
Begin
INSERT INTO [dbo].[D_1] (Donor_id,D_name,Address,City,Gender,Age,Blood_group,Date_of_donation,Email_id,Disease,DOB)
Values (@Donor_id,@D_name,@Address,@City,@Gender,@Age,@Blood_group,@Date_of_donation,@Email_id,@Disease,@DOB)
END
GO
Execute Insert_Donor 161118,'Hamza ayub','Nawan Shehar','Multan','M','21','B+','12-4-2018','hamxa6630@gmail.com','Cleared','23-11-1997'
```

Update Donor:

```
alter procedure update_Donor
(@Donor_id int,
@D_name varchar(50),
@Address varchar(50),
@City varchar(50),
@Gender varchar(50),
@Age varchar(50),
@Blood_group varchar(50),
@Date_of_donation varchar(50),
@Email_id varchar(50),
@Disease varchar(50),
@DOB varchar(50))

AS
Begin
update [dbo].[D_1]
set
D_name=@D_name,Address=@Address,City=@City,Gender=@Gender,Age=@Age,Blood_group=@Blood_group,Date_of_donation=@Date_of_donation,Email_id=@Email_id,
Disease=@Disease,DOB=@DOB where Donor_id=@Donor_id;
End
Go
Execute  update_Donor 161117,'Ahmad Raazi','lohari gate','Multan','M','21','B+','12-4-2018','Ahmad6630@gmail.com','Cleared','23-11-1997'
```

Delete Donor:

```
alter procedure Delete_Donor
(
@Donor_id int
)
AS
begin
delete from [dbo].[D_1]
where Donor_id = @Donor_id;
End
Go
Execute  Delete_Donor 161110

select * from [dbo].[D_1]
```

Output Donor:

	Donor_id	D_name	Address	City	Gender	Age	Blood_group	Date_of_donation	Email_id	Disease	DOB
1	16110	Hamza	Nawan Shehar	Multan	M	21	B+	12-4-2018	hamxa6630@gmail.com	Cleared	23-11-1997
2	161111	Hamza	Nawan Shehar	Multan	M	21	B+	12-4-2018	hamxa6630@gmail.com	Cleared	23-11-1997
3	161116	jahangir	Gulshan marketr	Multan	M	21	B+	12-4-2018	jahangir6630@gmail.com	Cleared	23-11-1997
4	161118	Hamza ayub	Nawan Shehar	Multan	M	21	B+	12-4-2018	hamxa6630@gmail.com	Cleared	23-11-1997

Blood:

Insert Blood

```
alter procedure Insert_Blood
(@B_id int,
@BG varchar(50),
@Quantity varchar(50),
@Donor_id varchar(50)
)
AS
Begin
INSERT INTO [dbo].[Blood_1] (Blood_Id,Blood_group,Quantity,Donor_id)
Values (@B_id,@BG,@Quantity,@Donor_id)
END
GO
Execute Insert_Blood 161117,'B+','1',161118

select * from  [dbo].[Blood_1]
```

Update Blood

```
create procedure update_Blood
(@B_id int,
@BG varchar(50),
@Quantity varchar(50),
@Donor_id varchar(50)
)
AS
Begin
Update [dbo].[Blood_1]
set
Blood_Id=@B_id,Blood_group=@BG,@Quantity=Quantity,Donor_id=@Donor_id
END
GO
Execute update_Blood 161117,'B+','1',161116
```

Delete Blood

```
alter procedure delete_Blood
( @B_id int
)
AS
Begin
DELETE FROM [dbo].[Blood_1]
WHERE Blood_Id= @B_id;
END
GO
Execute  delete_Blood 161117
```

Output Blood

	Blood_Id	Blood_group	Quantity	Donor_id
1	1	B+	2	16110
2	2	B-	3	161111
3	161117	B+	1	161118

Blood Bank:

Insert Blood bank

```
alter procedure Insert_Bloodbank
(
@BG varchar(50),
@Quantity varchar(50)

)
AS
Begin
INSERT INTO [dbo].[Blood_Bank] (Blood_group, Quantity)
Values (@BG,@Quantity)
END
GO
Execute Insert_Bloodbank 'O-','4'

select * from  [dbo].[Blood_Bank]
```

update Blood bank:

```
create procedure update_Blood
(@B_id int,
@BG varchar(50),
@Quantity varchar(50),
@Donor_id varchar(50)
)
AS
Begin
Update [dbo].[Blood_1]
set
Blood_Id=@B_id,Blood_group=@BG,@Quantity=Quantity,Donor_id=@Donor_id
END
GO
Execute update_Blood 161117,'B+','1',161116
```

Delete Blood Bank:

```
create procedure delete_Bloodbank
( @Bg int
)
AS
Begin
DELETE FROM [dbo].[Blood_Bank]
WHERE Blood_group= @Bg;
END
GO
Execute  delete_Bloodbank 161117
```

Output Blood bank

Results | Messages

	Blood_group	Quantity
1	B+	1
2	B-	2
3	B+	2
4	O-	4

Blood manage:1

Insert Blood Manage 1

```
create procedure Insert_bloodmanag1
(@Emp_id int,
@name   varchar(50)
)
AS
Begin
INSERT INTO [dbo].[blood_manage_1] (Employee_id,Name)
Values (@Emp_id,@name,@Phoneno)
ENd
GO
Execute Insert_bloodmanag1 9694,'Hamxa'

select * from [dbo].[blood_manage_1]
```

Update Blood Manage 1

```
create procedure update_bloodmanage1
(@emp_id int,
@name   varchar(50))
AS
Begin
Update  [dbo].[blood_manage_1]
set
Employee_id=@emp_id ,Name=@name
END
GO
Execute update_bloodmanage1 002,'hamza ayub'
```

Delete blood manage 1

```
create procedure delete_bloddmanag1
( @emp_id int
)
AS
Begin
DELETE FROM [dbo].[blood_manage_1]
WHERE Employee_id= @emp_id;
END
GO
Execute  delete_bloddmanag1 001
```

Output Blood manage 1

Results | Messages

	Employee_id	Name	id
1	9694	hamxa	1

Blood manage 2:

Insert blood manage 2

```
create procedure Insert_bloodmanag2
(@Email_id varchar(50),
@name   varchar(50),
@Phoneno varchar(50)
)
AS
Begin
INSERT INTO [dbo].[blood manage_2] (Email_id,Name,Phone_no)
Values (@Email_id,@name,@Phoneno)
ENd
GO
```

Update Blood manage 2

```
create procedure update_bloodmanagee2
(@email_id varchar(50),
@name   varchar(50),
@phoneno varchar(50)
)
AS
Begin
Update  [dbo].[blood manage_2]
set
Email_id=@email_id ,Name=@name,Phone_no=@phoneno
END
GO
Execute update_bloodmanagee2 'hamzaayub6630@gmail.com','hamza ayub','03039117538'
```

Delete Blood manage 2

```
create procedure delete_bloodmanagee2
( @email_id varchar(50)
)
AS
Begin
DELETE FROM [dbo].[blood manage_2]
WHERE Email_id= @email_id;
END
GO
Execute  delete_bloodmanagee2 'hamxa6630@gmail.com'
```

Hospital:

Insert Hospital:

```
alter procedure Insert_hospital
(@B_id int,
@name   varchar(50),
@address varchar(50),
@Phoneno varchar(50),
@bg varchar(50),
@Quant bigint
)
AS
Begin
INSERT INTO [dbo].[Hospital](Branch_id,Name,Address,Contact,Blood_group,Quantity)
Values (@B_id,@name,@address,@Phoneno,@bg,@Quant)
END
GO
Execute Insert_hospital 001,'City Hospital','Nawan shehar','03039117538','B+',3

select * from [dbo].[Hospital]
```

Update Hospital:

```
alter procedure update_hospital
(@B_id int,
@name   varchar(50),
@address varchar(50),
@phoneno varchar(50),
@Bg varchar(50),
@Quant bigint
)
AS
Begin
Update  [dbo].[Hospital]
set
Branch_id=@B_id,Name=@name,Address=@address,Contact=@phoneno,Blood_group=@Bg,Quantity=@Quant
END
GO
Execute update_hospital 161117,'City hospital','multan',0303194499,'B+',2
```

Delete Hospital:

```
create procedure delete_hospital
( @B_id int
)
AS
Begin
DELETE FROM [dbo].[Hospital]
WHERE Branch_id= @B_id;
END
GO
Execute  delete_hospital 161117
```

Output Hospital:

Results | Messages

	Branch_id	Name	Contact	Address	Blood_group	Quantity
1	161117	City hospital	303194499	multan	B+	2
2	1	City Hospital	3039117538	Nawan shehar	B+	3

Triggers

1. This trigger on donate blood after Insertion. When Insert the data in donate blood. It Triggers on donate blood and store the Blood into the Blood bank.
   And Sum all the quantity of each Blood group.

Query:

```
alter trigger updateBloodBankk on [dbo].[donate_Blood] after insert
AS
declare @old int;
declare @bloodgroup varchar(50);
declare @new int;
declare @updated_quantity int;
declare @count int;

select @bloodgroup = Blood_group from inserted;
select @old = Quantity from [dbo].[Blood_Bank];
select @new = Quantity from inserted;

set @updated_quantity = @old + @new;
set @count =  (SELECT count(Blood_group) FROM  [dbo].[Blood_Bank] WHERE Blood_group = @bloodgroup)

if @count > 0
update [dbo].[Blood_Bank]
set Quantity = @updated_quantity
where Blood_group = @bloodgroup

if @count = 0
insert into [dbo].[Blood_Bank] ( Blood_group , Quantity)
values (@bloodgroup , @new )

GO
select * from [dbo].[donate_Blood]
select * from  [dbo].[Blood_Bank]
```

Output:

Results | Messages

	CNIC	Name	Quantity	blood_group	Date
1	0		0		2018-05-05
2	1	asfa	12	B+	2018-05-05
3	2	asfa	13	B-	2018-05-05
4	12	csfa	6	O+	2018-05-05
5	78	dvd	2	O+	2018-05-05
6	99	sddsdsv	10	A+	2018-05-05
7	121	csfa	11	O+	2018-05-05
8	122	csfa	14	O-	2018-05-05

	Blood_group	Quantity
1	B+	1
2	B-	2

2. This Trigger On Hospital. When some request For Blood. If request is accepted after this the Quantity of Blood bank will decrese. If Blood is not available it Shows No found.

```
create trigger updateQuantity on [dbo].[Hospital] after insert
AS
declare @old int;
declare @bloodgroup varchar(50);
declare @updated_quantity int;
declare @count int;
declare @request int;

select @bloodgroup = Blood_group from inserted;
select @old = Quantity from [dbo].[Blood_Bank];
select @request = Quantity from inserted

set @updated_quantity = @old + @request;
set @count =  (SELECT count(Blood_group) FROM [dbo].[Blood_Bank] WHERE Blood_group = @bloodgroup)

if @count > 0
update [dbo].[Blood_Bank]
set Quantity = @updated_quantity
where Blood_group = @bloodgroup

if @count = 0
update [dbo].[Hospital]
set Blood_group = 'Not Found' , Quantity=0
where Blood_group=@bloodgroup
GO
select * from [dbo].[Blood_Bank]
select * from [dbo].[Hospital]
```

Output

Results | Messages

	Blood_group	Quantity
1	B+	1
2	B-	2
3	B+	2
4	O-	4

	Branch_id	Name	Contact	Address	Blood_group	Quantity
1	161117	City hospital	303194499	multan	B+	2
2	1	City Hospital	3039117538	Nawan shehar	B+	3