National Institute of Technology Warangal

Department of Computer Science and Engineering

B.Tech 2nd Year (CSE)

Military Database Management System

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Contents

DBMS Project Problem Statement

In this project, a database management system is designed to store the information of Soldiers. The database will be accessible to government and military administrators.

This database contains the personal details of soldiers, their family information, posting of soldiers, information about troops, available military vehicles and weapons, medical supplies and the awards and honors conferred upon the soldiers for their contributions on and off the battlefield.

This will help the officials to access various information quickly and provide resources to the military on time. It will also help in keeping track of all the weapons and supplies being used during wartime and show the requirements of weapons. We can efficiently find soldiers who are currently serving in a particular regiment and also the soldiers who have served in previous operations.

ER Model Assumptions

- A Soldier can participate in at most one operation while an operation can involve multiple numbers of soldiers. Each Operation must involve some soldier hence Total participation.
- A Soldier is given a salary on the basis of his Rank/Position in the Army.
- Multiple Soldiers are grouped to form a regiment. Each Soldier must be a part of one or the other regiment hence there is a total participation of Soldiers in this relationship.
- A Soldier can be honored by multiple medals and a particular medal can be awarded to multiple numbers of Soldiers hence there is a M:N relationship between the two entities.
- Each Soldier has a family whose details are stored in the form of Father's name, Number of children and his/her marital status.
- There are three inventories which belong to a particular regiment namely – Weapons inventory, Vehicle Inventory and Equipment Inventory.
- A Soldier's posting information involves the period of time for which he/she was or will be posted in that particular region. The period of time for which the Soldier is posted will already be predefined by the Army (We already know the deadline date in the future).
- There is a Location table which will serve two purposes – Storing the detailed address of the Soldier and storing the detailed address of all the places where a Soldier has been posted.

ER Model
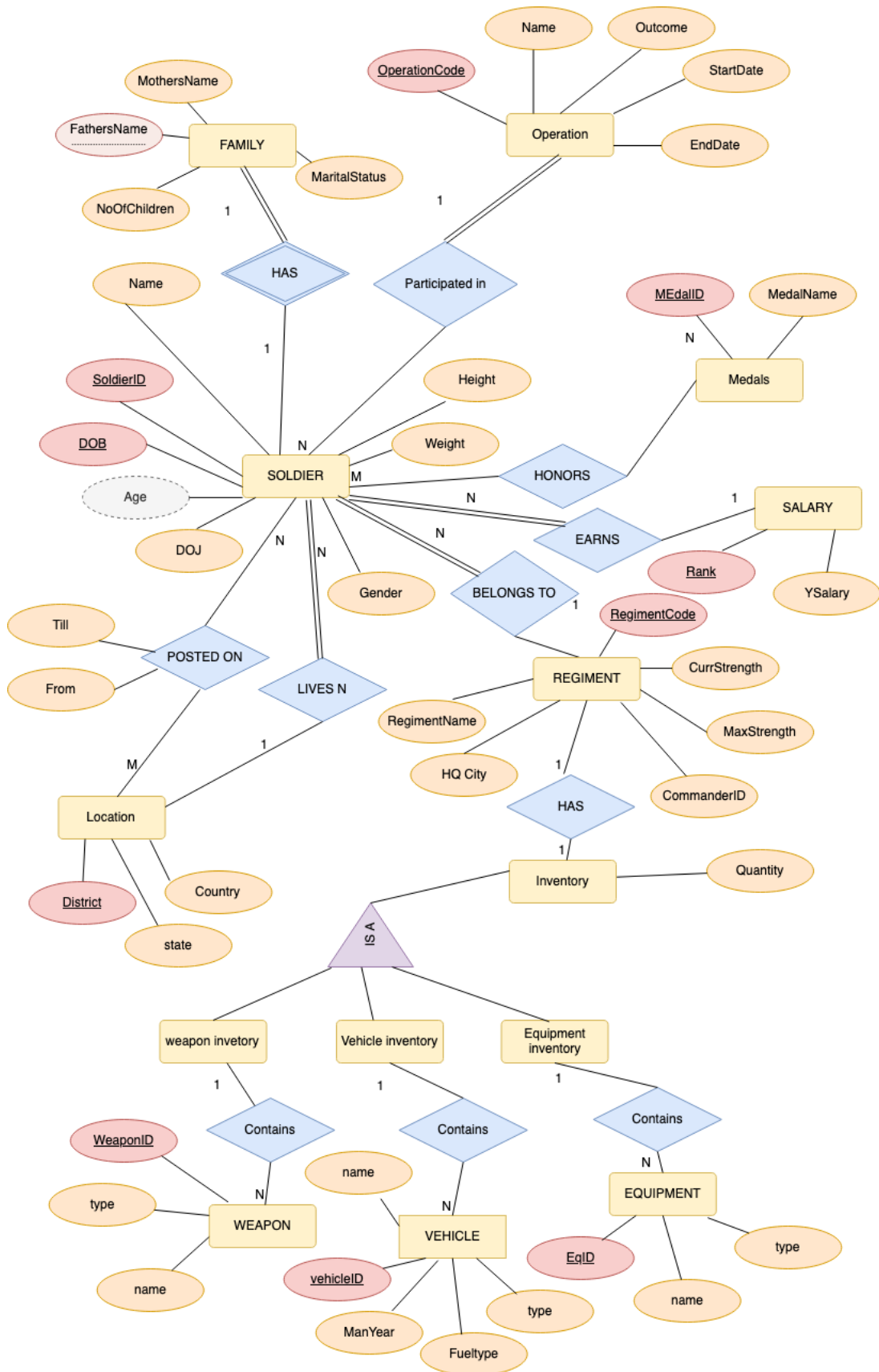
Functional Dependencies

1) Soldier -

SoldierID -> {Sname, DOB, DOJ, Weight, Height, Gender, District, RegimentCode, Srank}

SoldierID determines the relation. Since all the fields depend on SoldierID, $(SoldierID)_+$ -> R. Thus SoldierID is the Primary Key.

2) **Regiment** -

RegimentCode -> {Rname, HQCity, CurrStrength, MaxStrength, CommanderID}

RegimentCode determines the relation. Since all the fields depend on RegimentCode, $(RegimentCode)_+$ -> R. Thus RegimentCode is the Primary Key.

3) **Location** -

District -> {State, Country}

District determines the relation. Since all the fields depend on District, $(District)_+$ -> R. Thus the District is Primary Key.

4) **Family**-

{FatherName, SoldierID} -> {Children, MaritalStatus}
{MotherName, SoldierID} -> {Children, MaritalStatus}
{SoldierID} -> {MaritalStatus}

{FatherName, SoldierID} and {MotherName, SoldierID} determines the relation. Since all the fields depend on {FatherName, SoldierID}, {MotherName, SoldierID} .({FatherName, SoldierID})$_+$ -> R, {MotherName, SoldierID}+->R. Thus {FatherName, SoldierID},{MotherName, SoldierID} is Candidate Key.

5) Posting relation

This is relationship table between Soldier and Location table. It has two foreign keys SoldierID from Soldier table and District from Location tab

6) Medals

MedalID -> {MedalName, Prize}

MedalID determines the relation. Since all the fields depend on MedalID,

$(MedalID)_+ ->$ R. Thus MedalID is the Primary Key.

7) Honors relation

This is relationship table between Soldier and Medals table. It has two foreign keys SoldierID from Soldier table and MedalID from Medals table.

8) Salary

Srank->salary

Srank determines the relation. Since all the fields depend on Srank, $(Srank)_+ ->$ R. Thus Srank is Primary Key.

9) Weapons_Inventory

{RegimentCode, WeaponID} -> Quantity

{RegimentCode, WeaponID} determines the relation.Since all the fields depend on {RegimentCode, WeaponID}, $(\{RegimentCode, WeaponID\})_+ ->$ R. Thus {RegimentCode, WeaponID} is Primary Key.

10) Vehicle_Inventory

{RegimentCode, VehicleID} -> Quantity

{RegimentCode, VehicleID} determines the relation.Since all the fields depend on {RegimentCode, VehicleID}, $(\{RegimentCode, VehicleID\})_+ ->$ R. Thus {RegimentCode, VehicleID} is Primary Key.

11) Equipment_Inventory

{RegimentCode, EquipmentID} -> Quantity

{RegimentCode, EquipmentID} determines the relation.Since all the fields depend on {RegimentCode, EquipmentID}, $(\{RegimentCode, EquipmentID\})_+ ->$ R. Thus {RegimentCode, EquipmentID} is Primary

12) Weapon

WeaponID->{Wname, Wtype}

WeaponID determines the relation.Since all the fields depend on WeaponID, $(WeaponID)_+ ->$ R. Thus WeaponID is the Primary Key.

13) Vehicle

VehicleID->{Vname, Vtype, FuelType, ManYear}

VehicleID determines the relation.Since all the fields depend on VehicleID, (VehicleID)+ -> R. Thus VehicleID is the Primary Key.

14) Equipment

EquipmentID -> {Ename, Etype}

EquipmentID determines the relation.Since all the fields depend on EquipmentID, (EquipmentID)+ -> R. Thus EquipmentID is Primary Key.

15) Operations

OperationCode->{Oname, StartDate, EndDate,Outcome}

OperationCode determines the relation.Since all the fields depend on OperationCode, (OperationCode)+ -> R. Thus OperationCode is Primary Key.

Relational Schema

Soldier		
Attribute	Data type	Constraints
SoldierID	VARCHAR2(20)	Primary Key
Sname	VARCHAR2(20)	NOT NULL
DOB	DATE	NOT NULL
DOJ	DATE	NOT NULL
Height	INT	NOT NULL
Weight	INT	NOT NULL
Gender	CHAR	NOT NULL
District	VARCHAR2(20)	Foreign Key
RegimentCode	VARCHAR2(20)	Foreign Key
OperationCode	VARCHAR2(20)	Foreign Key
Srank	VARCHAR2(20)	Foreign Key

Regiment		
Attribute	Data type	Constraints
RegimentCode	VARCHAR2(20)	Primary Key
Rname	VARCHAR2(20)	NOT NULL
HQCity	VARCHAR2(20)	NOT NULL
CurrStrength	INT	NOT NULL
MaxStrength	INT	NOT NULL
CommanderID	VARCHAR2(20)	NOT NULL

Location

Attribute	Data type	Constraints
District	VARCHAR2(20)	Primary Key
State	VARCHAR2(20)	NOT NULL
Country	VARCHAR2(20)	NOT NULL

Posting

Attribute	Data type	Constraints
From Date	DATE	Not null
Till Date	DATE	Not Null
SoldierID	VARCHAR2(20)	Foriegn Key, Not Null
District	VARCHAR2(20)	Foreign Key, Not Null

Family

Attributes	Datatypes	Constraints
FatherName	VARCHAR(20)	Primary Key(1)
SoldierID	VARCHAR(20)	Primary Key(2), Foreign Key
MotherName	VARCHAR(20)	Primary Key
Children	INT	-
Marital Status	CHAR	NOT NULL

Medals

Attribute	Data type	Constraints
MedalID	VARCHAR2(20)	Primary Key
Medalname	VARCHAR2(20)	NOT NULL
Prize	INT	NOT NULL

Honors

Attribute	Data type	Constraints
MedalID	VARCHAR2(20)	Foreign key, not null
SoldierID	VARCHAR2(20)	Foreign key, not null

Salary

Attribute	Data type	Constraints
SRank	VARCHAR2(20)	Primary Key
Salary	INT	NOT NULL

Weapons_Inventory

Attribute	Data type	Constraints
RegimentCode	VARCHAR2(20)	Primary Key, Foreign Key
WeaponID	VARCHAR2(20)	Primary Key, Foreign Key
Quantity	INT	Not Null

Vehicle_Inventory

Attribute	Data type	Constraints
RegimentCode	VARCHAR2(20)	Primary Key(1), Foreign Key
VehicleID	VARCHAR2(20)	Primary Key(2), Foreign Key
Quantity	INT	Not null

Equipment_Inventory

| Attribute	Data type	Constraints
RegimentCode	VARCHAR2(20)	Primary Key(1), Foreign Key
EquipmentID	VARCHAR2(20)	Primary Key(2), Foreign Key
Quantity	INT	Not null

Weapon

Attribute	Data type	Constraints
WeaponID	VARCHAR2(20)	Primary Key
Wname	VARCHAR2(20)	Not Null
Wtype	VARCHAR2(20)	Not Null

Vehicle

Attribute	Data type	Constraints
VehicleID	VARCHAR2(20)	Primary Key
Vname	VARCHAR2(20)	Not Null
Vtype	VARCHAR2(20)	Not Null
FuelType	VARCHAR2(20)	Not Null
ManYear	INT	Not Null

Equipment

Attribute	Data type	Constraints
EquipmentID	VARCHAR2(20)	Primary Key
Ename	VARCHAR2(20)	NOT NULL
Etype	VARCHAR2(20)	NOT NULL

Operation

Attribute	Data type	Constraints
OperationCode	VARCHAR2(20)	Primary Key
Oname	VARCHAR2(20)	Not Null
StartDate	DATE	Not Null
EndDate	DATE	-
Outcome	VARCHAR2(20)	-

Relational Model
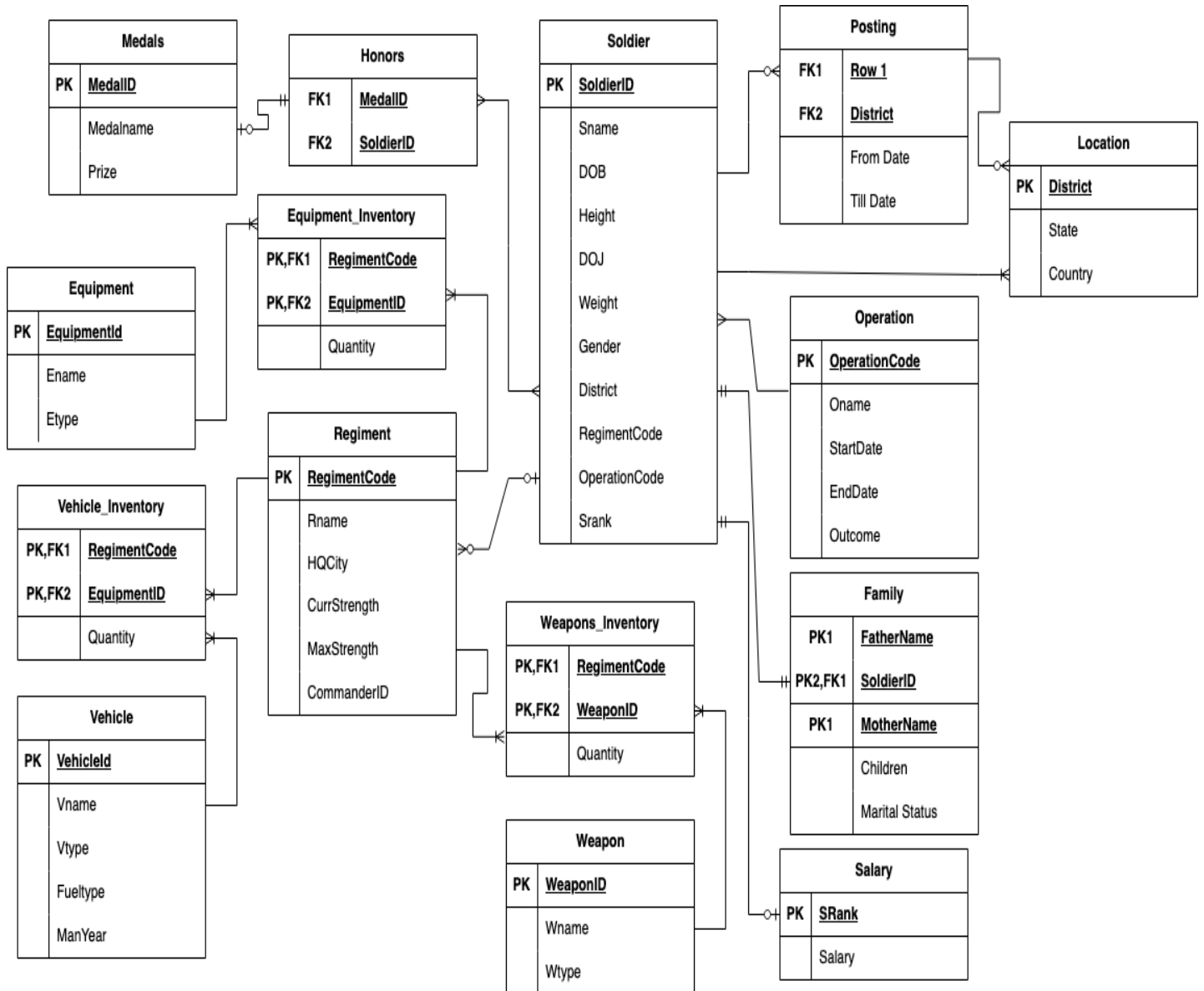
SQL Code

Table Creation :

```sql
 Create table regiment (
 regimentcode varchar(20) Primary key,
  rname varchar(20) not null,
  hqcity varchar(20) not null,
  currstrength int not null,
  maxstrength int not null,
  commanderid varchar(20) not null
);
create table location (
  district varchar(20) primary key,
  state varchar(20) not null,
  country varchar(20) not null
);
create table salary(
  sRank varchar(20) Primary key,
  salary INT not null
);
create table operation (
  operationcode varchar(20) primary key,
  oname varchar(20) not null,
  startdate date not null,
  enddate date not null,
  outcome varchar(20) not null
);
create table soldier (
  soldierid varchar(20) Primary key,
  sname varchar(20) not null,
  dob date not null,
  doj date not null,
  height int not null,
  weight int not null,
  gender char not null,
  district varchar(20) not null,
  regimentcode varchar(20),
  operationcode varchar(20),
  srank varchar(20) not null,
  foreign key(district) references location(district),
  foreign key (regimentcode) references regiment(regimentcode),
  foreign key (operationcode) references
operation(operationcode),
  foreign key (srank) references salary(srank)
);
create table weapon (
  weaponid varchar(20) Primary key,
  wname varchar(20) not null,
  wtype varchar(20) not null
);
create table vehicle (
  vehicleid varchar(20) Primary key,
  vname varchar(20) not null,
  vtype varchar(20) not null,
  fueltype varchar(20) not null,
  manyear int not null
);
create table equipment (
  equipmentid varchar(20) Primary key,
  ename varchar(20) not null,
  etype varchar(20) not null
);
create table weaponsinventory (
```

```sql
  quantity int not null,
  regimentcode varchar(20) not null,
  weaponid varchar(20) not null,
  foreign key (regimentcode) references regiment
(regimentcode),
  foreign key (weaponid) references weapon(weaponid)
);
create table vehiclesinventory (
  quantity int not null,
regimentcode varchar(20) not null,
  vehicleid varchar(20) not null,
  foreign key (regimentcode) references regiment
(regimentcode),
  foreign key (vehicleid) references vehicle(vehicleid)
);
create table equipmentsinventory (
  quantity int not null,
  regimentcode varchar(20) not null,
  equipmentid varchar(20) not null,
  foreign key (regimentcode) references regiment
(regimentcode),
  foreign key (equipmentid) references equipment(equipmentid)
);
create table medals (
  medalid varchar(20) primary key,
  medalname varchar(20) not null,
  prize INT not null
);
create table honors (
  medalid varchar(20) not null,
  soldierid varchar(20) not null,
  foreign key (medalid) references medals(medalid),
  foreign key (soldierid) references soldier (soldierid)
);
create table posting (
  pfrom date not null,
  ptill date not null,
  soldierid varchar(20) not null,
  district varchar(20) not null,
  foreign key(soldierid) references soldier(soldierid),
  foreign key(district) references location(district)
);
create table family (
  fathername varchar(20) not null,
  soldierid varchar(20) not null,
  children int not null,
maritalstatus char not null,
  foreign key (soldierid) references soldier (soldierid),
  primary key(soldierid, fathername)
);
```

Insert values:

```sql
INSERT INTO
regiment
VALUES
  (
    "R01", "Kumaon Regiment", "Ranikhet",57,85, "S12"
  ),
  ( "R02", "Rajput Regiment", "Fatehgarh",61,100, "S05"
  ),
  ( "R03", "Sikh Regiment", "Ramgarh", 75, 120, "S10"
  ),
  ( "R04", "Jat Regiment", "Bareilly", 51, 95, "S18"
  );
INSERT INTO
operation
VALUES
  ( "O01", "Operation Sahyog", '2018-09-24', '2018-11- 17',
"Successful"
```

```sql
    ),
    ( "O02", "Operation Calm Down", '2016-05-11', '2016- 08-02',
"Successful"
    ),
    ( "O03", "Operation All Out", '2015-06-13', '2015-07- 22',
"Unsuccessful"
    ),
    ( "O04", "Operation Maitri", '2015-02-02', '2015-05- 07',
"Successful"
    );
INSERT INTO
salary
VALUES
    ("Soldier", 25000),
    ("Major", 58000),
    ("Captain", 47500),
    ("Colonel", 65000),
    ("Brigadier", 73000),
    ("Lieutenant", 35000);
INSERT INTO
    location
VALUES
    ("Lucknow", "Uttar Pradesh", "India"),
    ("Bhopal", "Madhya Pradesh", "India"),
    ("Meerut", "Uttar Pradesh", "India"),
    ("Patna", "Bihar", "India"),
    ("Jalandhar", "Punjab", "India"),
    ("Almora", "Uttarakhand", "India"),
    ("Chandigarh", "Punjab", "India"),
    ("Tehri", "Uttarakhand", "India"),
    ("Indore", "Madhya Pradesh", "India"),
    ("Allahabad", "Uttar Pradesh", "India");
INSERT INTO
soldier
VALUES
    ( "S01", "Arjun Pratap", '1987-12-12', '2009-03-13',
        176,
        72, 'M', "Bhopal", "R02", "O03", "Colonel"
    ),
    ( "S02", "Saurabh Pandit", '1980-02-15', '2008-12-09',
        179,
        73, 'M', "Meerut", "R02", "O02", "Soldier"
    ),
    ( "S03", "Shubham Verma", '1990-02-24', '2011-04-15',
        182,
        76, 'M', "Bhopal", "R01", "O01", "Soldier"
    ),
    ( "S04", "Mayank Kumvat", '1978-06-14', '2011-09-21',
        163,
        69, 'M', "Almora", "R03", "O01", "Lieutenant"
    ),
    ( "S05", "Satveer Thakur", '1980-04-20', '2004-10-19',
        162,
        65, 'M', "Jalandhar", "R02", "O03", "Major"
    ),
( "S06", "Hamid Ahmed", '1976-06-10', '2004-02-24',
168,
    70, 'M', "Chandigarh", "R01", "O01", "Brigadier"
),
( "S07", "Ajay Singh", '1984-04-12', '2003-07-09',
    175,
    79, 'M', "Chandigarh", "R04", "O04", "Lieutenant"
),
( "S08", "Avantika Kulkarni", '1990-04-26', '2009-08-18',
    164,
    62, 'F', "Indore", "R04", "O02", "Soldier"
),
( "S09", "Abhishek Saxena", '1975-05-12', '2012-05-16',
    181,
    76, 'M', "Tehri", "R01", "O01", "Brigadier"
```

```sql
),
( "S10", "Rajveer Singh", '1969-02-15', '2000-03-25',
  173,
  70, 'M', "Allahabad", "R03", "O02", "Captain"
),
( "S11", "Karan Jagtap", '1988-02-05', '2011-09-02',
  167,
  70, 'M', "Allahabad", "R04", "O03", "Captain"
),
( "S12", "Vinay Kumar", '1972-07-07', '2004-04-01',
  169,
  65, 'M', "Meerut", "R01", "O04", "Colonel"
),
( "S13", "Rajat Talesra", '1976-09-19', '2007-10-24',
  172,
  76, 'M', "Patna", "R02", "O03", "Colonel"
),
( "S14", "Ankur Ranjan", '1969-10-11', '2001-07-22',
  169,
  64, 'M', "Almora", "R03", "O01", "Captain"
),
( "S15", "Disha Singh", '1983-09-18', '2008-02-28',
  165,
  65, 'F', "Lucknow", "R04", "O04", "Brigadier"
),
( "S16", "Niranjan Arya", '1971-12-04', '2010-10-21',
171,
    69, 'M', "Lucknow", "R02", "O02", "Lieutenant"
  ),
  ( "S17", "Dheeru Sachdev", '1981-01-19', '2015-12-31',
    168,
    66, 'M', "Tehri", "R03", "O01", "Soldier"
  ),
  ( "S18", "Vipul Yadav", '1975-06-05', '2004-01-24',
    179,
    74, 'M', "Indore", "R04", "O03", "Major"
  ),
  ( "S19", "Brijmohan Singh", '1998-11-25', '2014-02-12',
    173,
    65, 'M', "Lucknow", "R01", "O04", "Soldier"
  ),
  ( "S20", "Harminder Kaur", '1971-12-17', '2015-11-25',
    165,
    62, 'F', "Patna", "R02", "O04", "Colonel"
  );
INSERT INTO
weapon
VALUES
  ("W01", "Glock 17", "Pistol"),
  ("W02", "SPAS 15", "Shotgun"),
  ("W03", "Micro UZI", "SMG"),
  ("W04", "MP5", "SMG"),
  ("W05", "Steyr AUG", "AR"),
  ("W06", "AKM", "AR"),
  ("W07", "Barrett M95", "Sniper Rifle"),
  ("W08", "M4A1 Carbine", "AR"),
  ("W09", "Steyr SSG", "Sniper Rifle"),
  ("W10", "M249", "Machine Gun");
INSERT INTO
vehicle
VALUES
  (  "V01",  "Force Gurkha",  "Ligh Utility",  "Petrol", 2001
  ),
  ("V02", "AL Stallion", "Carrier", "Diesel", 2008),
  (  "V03",  "Sisu Nasu",  "All Terrain",  "Diesel", 1999
),
  ("V04", "Isuzu F", "Carrier", "Diesel", 2007),
  (  "V05",  "Arjun MBT",  "Battle Tank",  "Petrol", 1990
  ),
  ("V06", "Ajeya", "Battle Tank", "Diesel", 1996),
```

```sql
  (  "V07",  "Sarath",  "Infantry combat",  "Diesel", 2011
  ),
  (  "V08",  "Mazda R1",  "Light Utility",  "Petrol", 2009
  );
INSERT INTO
equipment
VALUES
  ("E01", "MKU Helmet", "Protective gear"),
  ("E02", "Kevlar Vest", "Protective gear"),
  ("E03", "Nigh Vision Goggle", "Utility"),
  ("E04", "HE Grenade", "Utility"),
  ("E05", "Health Pack", "Medicine"),
  ("E06", "First Aid Kit", "Medicine");
INSERT INTO
  weaponsinventory
VALUES
  (12, "R01", "W01"),
  (8, "R01", "W02"),
  (6, "R01", "W03"),
  (8, "R01", "W04"),
  (7, "R01", "W05"),
  (5, "R01", "W06"),
  (4, "R01", "W07"),
  (3, "R01", "W08"),
  (8, "R01", "W09"),
  (4, "R01", "W10"),
  (15, "R02", "W01"),
  (10, "R02", "W02"),
  (5, "R02", "W03"),
  (8, "R02", "W04"),
  (6, "R02", "W05"),
  (4, "R02", "W06"),
  (6, "R02", "W07"),
  (8, "R02", "W08"),
  (4, "R02", "W09"),
  (3, "R02", "W10"),
  (20, "R03", "W01"),
  (10, "R03", "W02"),
  (9, "R03", "W03"),
  (5, "R03", "W04"),
  (6, "R03", "W05"),
  (7, "R03", "W06"),
  (8, "R03", "W07"),
  (10, "R03", "W08"),
  (4, "R03", "W09"),
  (5, "R03", "W10"),
  (16, "R04", "W01"),
  (8, "R04", "W02"),
  (10, "R04", "W03"),
  (8, "R04", "W04"),
  (6, "R04", "W05"),
  (6, "R04", "W06"),
  (8, "R04", "W07"),
  (4, "R04", "W08"),
  (8, "R04", "W09"),
  (5, "R04", "W10");
INSERT INTO
  vehiclesinventory
VALUES
  (5, "R01", "V01"),
  (2, "R01", "V03"),
  (8, "R01", "V04"),
  (3, "R01", "V05"),
  (3, "R02", "V01"),
  (6, "R02", "V08"),
  (4, "R02", "V02"),
  (8, "R02", "V06"),
  (2, "R03", "V02"),
  (6, "R03", "V03"),
  (8, "R03", "V04"),
```

```sql
  (4, "R03", "V06"),
  (3, "R04", "V08"),
  (7, "R04", "V04"),
  (6, "R04", "V06"),
  (2, "R04", "V03");
INSERT INTO
  equipmentsinventory
VALUES
  (54, "R01", "E01"),
  (37, "R01", "E02"),
  (46, "R01", "E03"),
  (42, "R01", "E04"),
  (40, "R01", "E05"),
  (42, "R01", "E06"),
  (44, "R02", "E01"),
  (57, "R02", "E02"),
  (56, "R02", "E03"),
  (62, "R02", "E04"),
  (40, "R02", "E05"),
  (72, "R02", "E06"),
  (44, "R03", "E01"),
  (32, "R03", "E02"),
  (39, "R03", "E03"),
  (60, "R03", "E04"),
  (45, "R03", "E05"),
  (35, "R03", "E06"),
  (50, "R04", "E01"),
  (30, "R04", "E02"),
  (25, "R04", "E03"),
  (58, "R04", "E04"),
  (27, "R04", "E05"),
  (38, "R04", "E06");
INSERT INTO
medals
VALUES
  ("M01", "Param Vir Chakra", 75000),
  ("M02", "Ashok Chakra", 65000),
  ("M03", "Kirti Chakra", 50000),
  ("M04", "Sarvottam Seva Medal", 42500),
  ("M05", "Uttam Seva Medal", 35550),
  ("M06", "Sena Medal", 15000);
INSERT INTO
honors
VALUES
  ("M03", "S04"),
  ("M06", "S10"),
  ("M01", "S01"),
  ("M02", "S12"),
  ("M03", "S05"),
  ("M01", "S10"),
  ("M03", "S18"),
  ("M02", "S19"),
  ("M05", "S10"),
  ("M04", "S18"),
  ("M01", "S18"),
  ("M06", "S01"),
  ("M02", "S03"),
  ("M05", "S05"),
  ("M01", "S07"),
  ("M04", "S08"),
  ("M02", "S09"),
  ("M04", "S20"),
  ("M06", "S16"),
  ("M05", "S04"),
  ("M06", "S03"),
  ("M02", "S15"),
  ("M03", "S03");
INSERT INTO
posting
VALUES
```

```sql
  ('2017-10-23', '2020-10-22', "S01", "Lucknow"),
  ('2015-09-13', '2020-10-24', "S02", "Almora"),
  ('2016-07-02', '2020-08-10', "S03", "Tehri"),
  ('2017-11-11', '2020-11-12', "S04", "Meerut"),
  ('2015-10-07', '2020-11-09', "S05", "Patna"),
  ('2018-12-18', '2020-12-26', "S06", "Meerut"),
  ('2016-06-12', '2020-07-15', "S07", "Allahabad"),
  ('2015-10-13', '2020-11-20', "S08", "Patna"),
  ('2017-12-20', '2020-09-29', "S08", "Lucknow"),
  ('2015-11-09', '2020-06-06', "S09", "Lucknow"),
  ('2018-01-01', '2020-09-07', "S10", "Tehri"),
  ('2018-10-02', '2020-09-15', "S10", "Jalandhar"),
  ('2016-02-08', '2020-07-12', "S11", "Chandigarh"),
  ('2017-05-16', '2020-11-09', "S12", "Bhopal"),
  ('2015-12-01', '2020-05-19', "S12", "Allahabad"),
  ('2018-04-28', '2020-10-17', "S13", "Jalandhar"),
  ('2016-12-12', '2020-06-19', "S14", "Lucknow"),
  ('2017-07-19', '2020-05-18', "S15", "Bhopal"),
  ('2018-06-21', '2020-08-08', "S15", "Almora"),
  ('2016-07-16', '2020-02-12', "S16", "Chandigarh"),
  ('2017-03-21', '2020-04-12', "S16", "Tehri"),
  ('2015-05-11', '2020-06-04', "S16", "Lucknow"),
  ('2018-10-24', '2020-06-15', "S17", "Meerut"),
  ('2017-08-16', '2020-11-11', "S18", "Almora"),
  ('2015-04-21', '2020-07-15', "S19", "Allahabad"),
  ('2016-01-16', '2020-11-13', "S20", "Lucknow");
INSERT INTO
family
VALUES
  ("Kuwar Pratap", "S01", 1, 'Y'),
  ("Ashok Pandit", "S02", 0, 'N'),
  ("Rajeev Verma", "S03", 0, 'Y'),
  ("Manas Kumvat", "S04", 0, 'N'),
  ("Nilesh Thakur", "S05", 0, 'Y'),
  ("Ajaz Ahmed", "S06", 0, 'N'),
  ("Shantanu Singh", "S07", 2, 'Y'),
  ("Mahesh Kulkarni", "S08", 2, 'Y'),
  ("Prateek Saxena", "S09", 2, 'Y'),
  ("Aman Singh", "S10", 3, 'Y'),
  ("Arjun Jagtap", "S11", 1, 'Y'),
  ("Vijay Kumar", "S12", 0, 'N'),
  ("Naman Talesra", "S13", 0, 'Y'),
  ("Aditya Ranjan", "S14", 1, 'Y'),
  ("Akbar Singh", "S15", 3, 'Y'),
  ("Dhirendra Arya", "S16", 0, 'N'),
  ("Harshvardhan Sachdev", "S17", 2, 'Y'),
  ("Umesh Yadav", "S18", 1, 'Y'),
  ("Balkishore Singh", "S19", 1, 'Y'),
  ("Jaspreet Kaur", "S20", 2, 'Y');
```

Normalization

1. **Soldier**
   Candidate Key- { SoldierID }
   Prime attributes- {SoldierID}
   Non prime attribute- {Sname, DOB, DOJ, Weight, Height, Gender, District, RegimentCode,OperationCode, Srank}
   All attributes depend on the SoldierID.
   There is no partial dependency, no sub attribute of candidate key exists. Thus it is in 2NF.
   There is no non-prime→ non-prime FD. Thus the table is in 3NF.
   All determinants are strictly candidate keys, Hence the table is in BCNF.

2. **Regiment**
   Candidate Key- { RegimentCode }
   Prime attributes- {RegimentCode}
   Non prime attribute- {Rname, HQCity, CurrStrength, MaxStrength, CommanderID}
   All attributes depend on the RegimentCode.
   There is no partial dependency, no sub attribute of candidate key exists. Thus it is in 2NF.
   There is no non-prime→ non-prime FD. Thus the table is in 3NF.
   All determinants are strictly candidate keys, Hence the table is in BCNF.

3. **Location**
   Candidate Key- { District}
   Prime attributes- {District}
   Non prime attribute- {State, Country}
   All attributes depend on the District.
   There is no partial dependency, no sub attribute of candidate key exists. Thus it is in 2NF.
   There is no non-prime→ non-prime FD. Thus the table is in 3NF.
   All determinants are strictly candidate keys, Hence the table is in BCNF.

4. **Family**
   Candidate Key- { FatherName + SoldierID, MotherName + SoldierID}
   Prime attributes- {FatherName, MotherName, SoldierID}
   Non prime attribute- {Children, Marital Status}
   Here subset SoldierID determines Marital Status of the soldier.
   There is partial dependency. Thus we divide the table for marital status + SoldierID as Family_Marital and Family_Children.
   Table Marital status + SoldierID is in BCNF.
   Table FatherName + SoldierID + MotherName doesn't have non-prime→ non-prime FD. Thus the table is in 3NF.
   All determinants are strictly candidate keys, Hence the table is in BCNF.

5. **Posting**
   Foreign Key- { SoldierID + District }
   Prime attributes- {SoldierID, District}
   Non prime attribute- {From Date, Till Date}
   All attributes depend on the SoldierID + District.
   There is no partial dependency. Thus it is in 2NF.
   There is no non-prime→ non-prime FD. Thus the table is in 3NF.

All determinants are strictly candidate keys, Hence the table is in BCNF.

6. **Medals**
   Candidate Key- { MedalID }
   Prime attributes- {MedalID}
   Non prime attribute- {MedalName, Prize}
   All attributes depend on the MedalID.
   There is no partial dependency, no sub attribute of candidate key exists. Thus it is in 2NF.
   There is no non-prime→ non-prime FD. Thus the table is in 3NF.
   All determinants are strictly candidate keys, Hence the table is in BCNF.

7. **Salary**
   Candidate Key- { Srank }
   Prime attributes- {Srank}
   Non prime attribute- {Salary}
   All attributes depend on the Srank.
   There is no partial dependency, no sub attribute of candidate key exists. Thus it is in 2NF.
   There is no non-prime→ non-prime FD. Thus the table is in 3NF.
   All determinants are strictly candidate keys, Hence the table is in BCNF.

8. **Weapons_Inventory**
   Candidate Key- { RegimentCode + WeaponID}
   Prime attributes- {RegimentCode, WeaponID}
   Non prime attribute- {Quantity}
   All attributes depend on the RegimentCode + WeaponID.
   There is no partial dependency. Thus it is in 2NF.
   There is no non-prime→ non-prime FD. Thus the table is in 3NF.
   All determinants are strictly candidate keys, Hence the table is in BCNF.

9. **Vehicle_Inventory**
   Candidate Key- { RegimentCode + VehicleID }
   Prime attributes- {RegimentCode, VehicleID}
   Non prime attribute- {Quantity}
   All attributes depend on the RegimentCode + VehicleID
   There is no partial dependency. Thus it is in 2NF.
   There is no non-prime→ non-prime FD. Thus the table is in 3NF.
   All determinants are strictly candidate keys, Hence the table is in BCNF.

10. **Equipment_Inventory**
    Candidate Key- {RegimentCode + EquipmentID}
    Prime attributes- {RegimentCode, EquipmentID}
    Non prime attribute- {Quantity}
    All attributes depend on the {RegimentCode, EquipmentID}.
    There is no partial dependency. Thus it is in 2NF.
    There is no non-prime→ non-prime FD. Thus the table is in 3NF.
    All determinants are strictly candidate keys, Hence the table is in BCNF.

11. **Weapon**
    Candidate Key- { WeaponID }
    Prime attributes- {WeaponID}
    Non prime attribute- {Wname, Wtype}
    All attributes depend on the WeaponID.
    There is no partial dependency, no sub attribute of candidate key exists. Thus it is in 2NF.

There is no non-prime→ non-prime FD. Thus the table is in 3NF.
All determinants are strictly candidate keys, Hence the table is in BCNF.

12. Vehicle

Candidate Key- { VehicleID }
Prime attributes- {VehicleID}
Non prime attribute- {Vname, Vtype, FuelType, ManYear}
All attributes depend on the VehicleID.
There is no partial dependency, no sub attribute of candidate key exists. Thus it is in 2NF.
There is no non-prime→ non-prime FD. Thus the table is in 3NF.
All determinants are strictly candidate keys, Hence the table is in BCNF.

13. Equipment

Candidate Key- { EquipmentID }
Prime attributes- {EquipmentID}
Non prime attribute- {Ename, Etype}
All attributes depend on the EquipmentID.
There is no partial dependency, no sub attribute of candidate key exists. Thus it is in 2NF.
There is no non-prime→ non-prime FD. Thus the table is in 3NF.
All determinants are strictly candidate keys, Hence the table is in BCNF.

14. Operations

Candidate Key- { OperationCode }
Prime attributes- {OperationCode}
Non prime attribute- {Oname, StartDate, EndDate, Outcome}
All attributes depend on the OperationCode.
There is no partial dependency, no sub attribute of candidate key exists. Thus it is in 2NF.
There is no non-prime→ non-prime FD. Thus the table is in 3NF.
All determinants are strictly candidate keys, Hence the table is in BCNF.

Normalized Relational Model