

## CPSC 304

Cover Page for Project Part \_\_2\_\_

Date: \_\_Mar 2nd, 2022\_\_

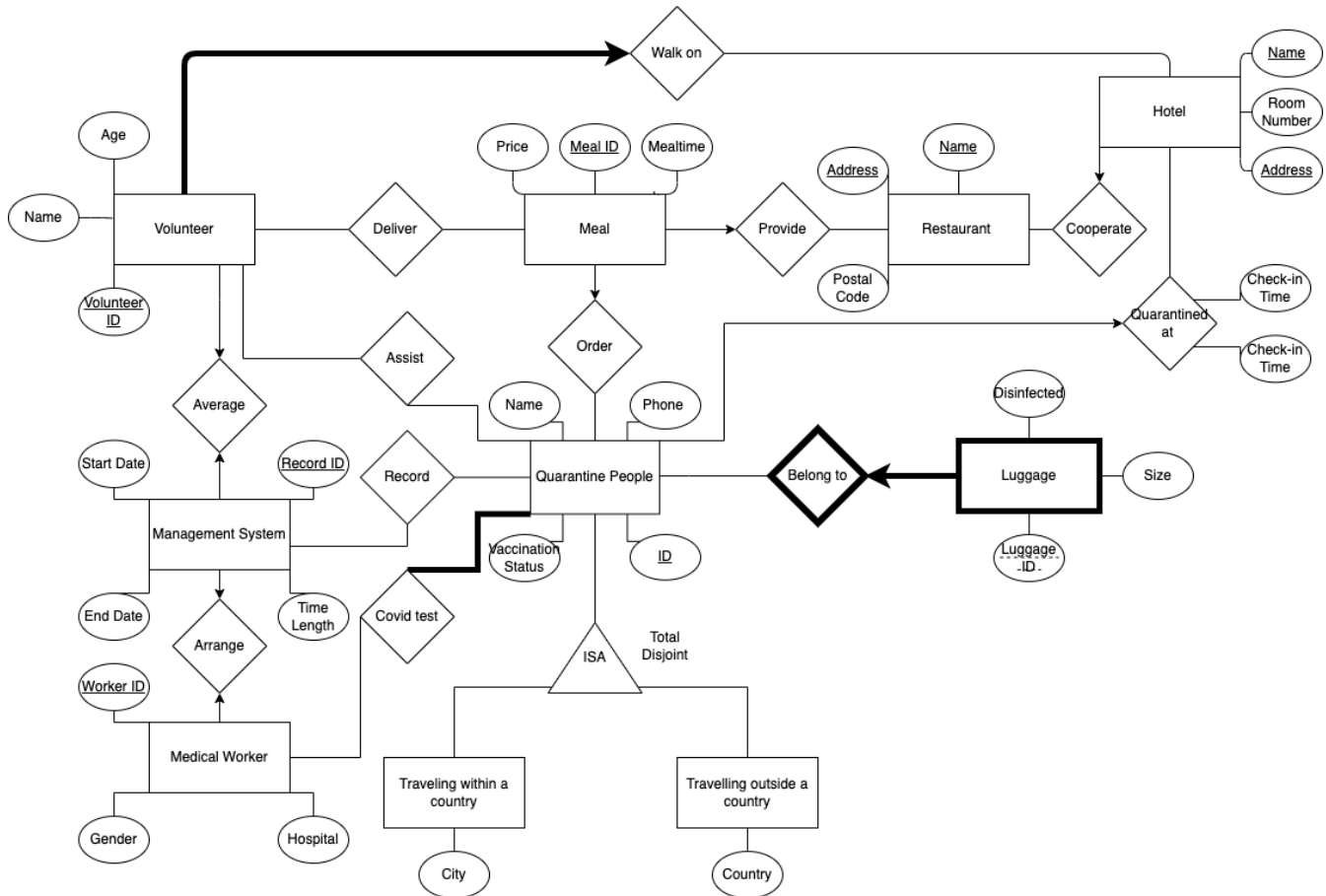
Project Group Number on Canvas: \_\_66\_\_

### Group Members:

Name	Student Number	CS Alias (Userid)	Preferred E-mail Address
Dan Liu	14118566	i2g3b	liudan1_2019@163.com
Manqin Cai	59000448	o5i3b	caimanqin125@163.com
Austin Zeng	31042997	q5k1h	austinzeng0229@gmail.com

By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above. (In the case of Project Milestone 0, the main purpose of this page is for you to let us know your e-mail address, and then let us assign you to a TA for your project supervisor.)

In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia



### Update:

1. Specify the primary key "ID" of Quarantine People.
2. We change 2 relations about Management System from "many to one" to "one to one". Therefore, each record id will connect to only one volunteer and one medical worker.
3. We change Management System's attributes from "Volunteer ID", "ID" and "Worker ID" to "Start Date", "End Date" and "Time Length". The primary key "Record ID" remains unchanged.

## Schema, FDs and Normalizations

- Although ISA hierarchy here is total disjoint, the first method is a better way to translate. Since there are many relationships attached to the super class. Thus, we require tables for:

QQ (ID: string, Name: string, Phone: string, VaccinationStatus: integer, Check-inTime: datetime, Check-outTime: datetime, **HAddress: string, HName: string**)

Primary keys: ID

Candidate keys: {ID}, {Name, Phone}

Foreign keys: **HAddress, HName**

FDs:

ID -> Name, Phone, VaccinationStatus, Check-inTime, Check-outTime, HAddress, HName

Phone -> VaccinationStatus

2NF

Normalization:

QQMain (ID, Name, Phone, Check-inTime, Check-outTime, HAddress, HName)

FD: ID -> Name, Phone, Check-inTime, Check-outTime, HAddress, HName

--BCNF

QQTime (Phone, VaccinationStatus)

FD: Phone -> VaccinationStatus --BCNF

TravellingWithinACountry (ID: string, City: string)

Primary keys: ID

Candidate keys: ID

Foreign keys: ID

FDs:

ID -> City

BCNF

TravellingOutsideACountry (ID: string, Country: string)

Primary keys: ID

Candidate keys: ID

Foreign keys: ID

FDs:

ID -> Country

BCNF

- Since Luggage is a weak entity, we'd create one table for it and BelongTo, which contains the key of QQ as a key:  
L\_B (LuggageID: string, **ID**: string, Size: integer, Disinfected: integer)  
where ID is a foreign key of QQ. Because Luggage is a weak entity, we must delete a L\_B tuple if the corresponding QQ tuples disappears.  
Primary keys: LuggageID, **ID**  
Candidate keys: LuggageID, **ID**  
Foreign keys: **ID**  
FDs:  
LuggageID, ID -> Size, Disinfected  
BCNF

- CovidTest (**ID**: string, WorkerID: string)  
Primary keys: **ID**, WorkerID  
Candidate keys: **ID**, WorkerID  
Foreign keys: **ID**, WorkerID  
FDs: BCNF

- Medical Worker and Arrange:  
M\_A (WorkerID: string, Gender: string, Hospital: string, **RecordID**: string)  
Primary keys: WorkerID  
Candidate keys: WorkerID  
Foreign keys: **RecordID**  
FDs:  
WorkerID -> Gender, Hospital, RecordID  
RecordID -> WorkerID  
3NF

- ManagementSystem (RecordID: string, StartDate: datetime, EndDate: datetime, TimeLength: integer)  
Primary keys: RecordID  
Candidate keys: RecordID  
Foreign keys: N/A  
FDs:  
RecordID -> StartDate, EndDate, TimeLength  
StartDate, EndDate -> TimeLength  
2NF

Normalization:

MSMain (RecordID, StartDate, EndDate)

FD: RecordID -> StartDate, EndDate --BCNF

MSTime (StartDate, EndDate, TimeLength)

FD: StartDate, EndDate -> TimeLength --BCNF

- Record (**RecordID: string, ID: string**)  
 Primary keys: **RecordID, ID**  
 Candidate keys: **RecordID, ID**  
 Foreign keys: **RecordID, ID**  
 FDs: **BCNF**
- Volunteer Arrange and WorkIn:  
 Hotel's name: HName, Hotel's address: HAddress  
 VAW (**VolunteerID: string, Age: integer, Name: string, RecordID: string, HName: string, HAddress: string**)  
 Primary keys: **VolunteerID**  
 Candidate keys: **VolunteerID**  
 Foreign keys: **RecordID, HName, HAddress**  
 FDs:  
 VolunteerID -> Age, Name, RecordID, HName, HAddress  
 RecordID -> VolunteerID  
**3NF**
- Assist (**VolunteerID: string, ID: string**)  
 Primary keys: **VolunteerID, ID**  
 Candidate keys: **VolunteerID, ID**  
 Foreign keys: **VolunteerID, ID**  
 FDs: **BCNF**
- Deliver (**VolunteerID: string, MealID: string**)  
 Primary keys: **VolunteerID, MealID**  
 Candidate keys: **VolunteerID, MealID**  
 Foreign keys: **VolunteerID, MealID**  
 FDs: **BCNF**
- Meal order and provide:  
 Restaurant's name: RName, Hotel's address: RAddress  
 MOP (**MealID: string, Price: integer, Mealtime: string, ID: string, RName: string, RAddress: string**)  
 Primary keys: **MealID**  
 Candidate keys: **MealID**  
 Foreign keys: **ID, RName, RAddress**  
 FDs:  
 MealID -> Price, Mealtime, ID, RName, RAddress

- Restaurant (RName: string, RAddress: string, PostalCode: string)  
 Primary keys: RName, RAddress  
 Candidate keys: RName, RAddress  
 Foreign keys: N/A  
 FDs:  
RName, RAddress -> PostalCode  
PostalCode -> RAddress  
 3NF
- Hotel and Cooperate:  
 H\_C (HName: string, HAddress: string, RomeNumber: string, **RName: string, RAddress: string**)  
 Primary keys: HName, HAddress  
 Candidate keys: HName, HAddress  
 Foreign keys: **RName, RAddress**  
 FDs:  
HName, HAddress -> RomeNumber, RName, RAddress  
 BCNF

## SQL DDL

```
CREATE TABLE QQ (
  ID CHAR(20) PRIMARY KEY,
  Name CHAR(20),
  Phone CHAR(20),
  VaccinationStatus INTEGER,
  Check-inTime DATETIME,
  Check-outTime DATETIME,
  HAddress CHAR(50),
  HName CHAR(20),
  FOREIGN KEY (HAddress) REFERENCES H_C
    ON DELETE CASCADE
    ON UPDATE CASCADE
  FOREIGN KEY (HAddress) REFERENCES H_C
    ON DELETE CASCADE
    ON UPDATE CASCADE
)
```

```
CREATE TABLE TravellingWithinACountry (
  ID CHAR(20) PRIMARY KEY,
  City CHAR(20),
  FOREIGN KEY (ID) REFERENCES QQ
    ON DELETE CASCADE
    ON UPDATE CASCADE
)
```

```
CREATE TABLE TravellingOutsideACountry (  
  ID CHAR(20) PRIMARY KEY,  
  Country CHAR(20),  
  FOREIGN KEY (ID) REFERENCES QQ  
    ON DELETE CASCADE  
    ON UPDATE CASCADE  
)
```

```
CREATE TABLE L_B (  
  LuggageID CHAR(20),  
  ID CHAR(20),  
  Size INTEGER,  
  Disinfected INTEGER,  
  PRIMARY KEY (LuggageID, ID),  
  FOREIGN KEY (ID) REFERENCES QQ  
    ON DELETE CASCADE  
    ON UPDATE CASCADE  
)
```

```
CREATE TABLE CovidTest (  
  WorkerID CHAR(20),  
  ID CHAR(20),  
  PRIMARY KEY (WorkerID, ID),  
  FOREIGN KEY (WorkerID) REFERENCES M_A  
    ON DELETE CASCADE  
    ON UPDATE CASCADE  
  FOREIGN KEY (ID) REFERENCES QQ  
    ON DELETE CASCADE  
    ON UPDATE CASCADE  
)
```

```
CREATE TABLE M_A (  
  WorkerID CHAR(20),  
  Gender CHAR(10),  
  Hospital CHAR(20),  
  RecordID CHAR(20),  
  PRIMARY KEY (WorkerID),  
  FOREIGN KEY (RecordID) REFERENCES ManagementSystem  
    ON DELETE CASCADE  
    ON UPDATE CASCADE  
)
```

```
CREATE TABLE ManagementSystem (  
  StartDate DATETIME,  
  EndDate DATETIME,  
  TimeLength INTEGER,  
  RecordID CHAR(20),  
  PRIMARY KEY (RecordID),  
)
```

```
CREATE TABLE Record (  
  ID CHAR(20),  
  RecordID CHAR(20),  
  PRIMARY KEY (RecordID, ID),  
  FOREIGN KEY (ID) REFERENCES QQ  
    ON DELETE CASCADE  
    ON UPDATE CASCADE  
  FOREIGN KEY (RecordID) REFERENCES ManagementSystem  
    ON DELETE CASCADE  
    ON UPDATE CASCADE  
)
```

```
CREATE TABLE VAW (  
  VolunteerID CHAR(20),  
  Age INTEGER,  
  Name CHAR(20),  
  RecordID CHAR(20),  
  HName CHAR(20),  
  HAddress CHAR(20) NOT NULL,  
  PRIMARY KEY (VolunteerID),  
  FOREIGN KEY (RecordID) REFERENCES ManagementSystem  
    ON DELETE CASCADE  
    ON UPDATE CASCADE  
  FOREIGN KEY (HName) REFERENCES H_C  
    ON DELETE CASCADE  
    ON UPDATE CASCADE  
  FOREIGN KEY (HAddress) REFERENCES H_C  
    ON DELETE CASCADE  
    ON UPDATE CASCADE  
)
```



```
CREATE TABLE Assist (  
    VolunteerID CHAR(20),  
    ID CHAR(20),  
    PRIMARY KEY (VolunteerID, ID),  
    FOREIGN KEY (VolunteerID) REFERENCES VAW  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
    FOREIGN KEY (ID) REFERENCES QQ  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
)
```

```
CREATE TABLE Deliver (  
    VolunteerID CHAR(20),  
    MealID CHAR(20),  
    PRIMARY KEY (VolunteerID, MealID),  
    FOREIGN KEY (VolunteerID) REFERENCES VAW  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
    FOREIGN KEY (MealID) REFERENCES MOP  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
)
```

```
CREATE TABLE MOP (  
    MealID CHAR(20),  
    Price INTEGER,  
    Mealtimes CHAR(10),  
    ID CHAR(20),  
    RName CHAR(20),  
    RAddress CHAR(20),  
    PRIMARY KEY (MealID),  
    FOREIGN KEY (ID) REFERENCES QQ  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
    FOREIGN KEY (RName) REFERENCES Restaurant  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
    FOREIGN KEY (RAddress) REFERENCES Restaurant  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
)
```

```
CREATE TABLE Restaurant (  
  RName CHAR(20),  
  RAddress CHAR(20),  
  PostalCode CHAR(10),  
  PRIMARY KEY (RName, RAddress),  
)
```

```
CREATE TABLE H_C (  
  HName CHAR(20),  
  HAddress CHAR(20),  
  RoomNumber INTEGER,  
  RName CHAR(20),  
  RAddress CHAR(20),  
  PRIMARY KEY (HName, HAddress),  
  FOREIGN KEY (RName) REFERENCES Restaurant  
    ON DELETE CASCADE  
    ON UPDATE CASCADE  
  FOREIGN KEY (RAddress) REFERENCES Restaurant  
    ON DELETE CASCADE  
    ON UPDATE CASCADE  
)
```

## Populate tables

```
INSERT
INTO QQ (ID, Name, Phone, VaccinationStatus, Check-inTime, Check-outTime,
Haddress, HName)
VALUES (E3579124, 'Robert Wang', 17788987114, 3, '2021-10-10', '2021-10-24', '1345
Williams Rd', 'As Home'),
(G9123574, 'Juvenal Rais', 16046867812, 2, '2021-11-8', '2021-11-15', '268 14
Ave', '7 Days'),
(L3546594, 'Itai Tomic', 12359741455, 2, '2021-11-10', '2021-11-17', '134
Broadway St', 'Holiday Inn'),
(342687952, 'Augustina Gupta', 17787555169, 3, '2021-12-9', '2021-12-16',
'10118 Gilbert Rd', 'Super 8'),
(798563128, 'Rozalija Banner', 16048187970, 1, '2021-12-10', '2021-12-17',
'1345 Williams Rd', 'As Home'),
(EG5134124, 'Gracey Mcneill', 19887117784, 3, '2021-10-10', '2021-10-24',
'1345 Williams Rd', 'As Home'),
(LX91489574, 'Kiara Hastings', 16867604812, 2, '2021-11-8', '2021-11-15', '268
14 Ave', '7 Days'),
(789142857, 'Kaydan Lam', 12351455974, 2, '2021-11-10', '2021-11-17', '134
Broadway St', 'Holiday Inn'),
(742578891, 'Aled Reilly', 17787732519, 3, '2021-12-9', '2021-12-16', '10118
Gilbert Rd', 'Super 8'),
(127985638, 'Alaw Sampson', 16049741970, 2, '2021-12-10', '2021-12-17', '4606
Ferguson Rd', 'Sheraton');
```

```
INSERT
INTO TravellingWithinACountry (ID, City)
VALUES (342687952, 'Kelowna'),
(798563128, 'London'),
(789142857, 'Vancouver'),
(742578891, 'Toronto'),
(127985638, 'Calgary');
```

```
INSERT
INTO TravellingOutsideACountry (ID, Country)
VALUES (EG5134124, 'Japan'),
(LX91489574, 'Russia'),
(E3579124, 'China'),
(G9123574, 'UK'),
(L3546594, 'USA');
```

```

INSERT
INTO      L_B (LuggageID, ID, Size, Disinfected)
VALUES    (1, E3579124, 2, 1),
          (2, G9123574, 1, 1),
          (3, L3546594, 3, 1),
          (4, 342687952, 2, 0),
          (5, 798563128, 3, 1),
          (6, EG5134124, 3, 0),
          (7, LX91489574, 2, 1),
          (8, 789142857, 1, 0),
          (9, 742578891, 1, 1),
          (10, 127985638, 2, 1);

```

```

INSERT
INTO      CovidTest (WorkerID, ID)
VALUES    (25389, E3579124),
          (25389, G9123574),
          (26877, L3546594),
          (26877, 342687952),
          (35125, 798563128),
          (53897, EG5134124),
          (14080, LX91489574),
          (53897, 789142857),
          (53897, 742578891),
          (14080, 127985638);

```

```

INSERT
INTO      M_A (WorkerID, Gender, Hospital, RecordID)
VALUES    (25389, 'M', 'VGH', 100001),
          (25389, 'M', 'VGH', 100002),
          (26877, 'F', 'SPH', 100003),
          (26877, 'F', 'SPH', 100004),
          (35125, 'F', 'VGH', 100005),
          (53897, 'F', 'RH', 100006),
          (53897, 'F', 'RH', 100008),
          (53897, 'F', 'RH', 100009),
          (14080, 'M', 'SPH', 100010),
          (14080, 'M', 'SPH', 100007);

```

```

INSERT
INTO      ManagementSystem (StartDate, EndDate, TimeLength , RecordID)
VALUES    ('2021-10-10', '2021-10-24', 14, 100001),
          ('2021-11-8', '2021-11-15', 7, 100002),
          ('2021-11-10', '2021-11-17', 7, 100003),
          ('2021-12-9', '2021-12-16', 7, 100004),
          ('2021-12-10', '2021-12-17', 7, 100005),
          ('2021-10-10', '2021-10-24', 14, 100006),
          ('2021-11-8', '2021-11-15', 7, 100007),
          ('2021-11-10', '2021-11-17', 7, 100008),
          ('2021-12-9', '2021-12-16', 7, 100009),
          ('2021-12-10', '2021-12-17', 7, 100010);

```

```

INSERT
INTO      Record (ID, RecordID)
VALUES    (E3579124, 100001),
          (G9123574, 100002),
          (L3546594, 100003),
          (342687952, 100004),
          (798563128, 100005),
          (EG5134124, 100006),
          (LX91489574, 100007),
          (789142857, 100008),
          (742578891, 100009),
          (127985638, 100010);

```

```

INSERT
INTO      VAW (VolunteerID, Age, Name, RecordID, HName, HAddress)
VALUES    (101, 22, 'Rob', 100001, 'As Home', '1345 Williams Rd'),
          (101, 22, 'Rob', 100005, 'As Home', '1345 Williams Rd'),
          (102, 25, 'Bill', 100002, '7 Days', '268 14 Ave'),
          (103, 20, 'Kevin', 100003, 'Holiday Inn', '134 Broadway St'),
          (104, 30, 'Leo', 100009, 'Super 8', '10118 Gilbert Rd'),
          (106, 26, 'Annie', 100004, 'Super 8', '10118 Gilbert Rd'),
          (105, 28, 'Sarah', 100010, 'Sheraton', '4606 Ferguson Rd');

```

```

INSERT
INTO      Assist (VolunteerID , ID)
VALUES    (101, E3579124),
          (101, 798563128),
          (102, G9123574),
          (103, L3546594),
          (105, 127985638),
          (106, 342687952),
          (104, 742578891);

```

```

INSERT
INTO Deliver (VolunteerID , MealID)
VALUES (101, 1001),
       (102, 1002),
       (103, 1003),
       (106, 1004),
       (105,1005);

```

```

INSERT
INTO MOP (MealID, Price, Mealtimes, ID, RName, RAddress)
VALUES (1001, 40, 'BLD', E3579124, 'SuperDilicious', '135 Williams Rd'),
       (1002, 30, 'LD', G9123574, '37 Pho', '268 16 Ave'),
       (1003, 30, 'BD', L3546594, '37 Pho', '268 16 Ave'),
       (1004, 45, 'BLD', 342687952, 'NiceBurger', '10018 Gilbert Rd'),
       (1005, 55, 'BLD', 127985638, 'Ginger', '4666 Ferguson Rd');

```

```

INSERT
INTO Restaurant (RName, RAddress, PostalCode)
VALUES ('SuperDilicious', '135 Williams Rd', 'V7C5S8'),
       ('37 Pho', '268 16 Ave', 'V6Y4H6'),
       ('HaiDiLao', '238 Broadway St', 'V5H3C9'),
       ('NiceBurger', '10018 Gilbert Rd', 'V7S6X3'),
       ('Ginger', '4666 Ferguson Rd', 'V4M8T2');

```

```

INSERT
INTO H_C (HName, HAddress, RoomNumber, RName, RAddress)
VALUES ('As Home', '1345 Williams Rd', 200, 'SuperDilicious', '135 Williams Rd'),
       ('7 Days', '268 14 Ave', 150, '37 Pho', '268 16 Ave'),
       ('Holiday Inn', '134 Broadway St', 220, '37 Pho', '268 16 Ave'),
       ('Super 8', '10118 Gilbert Rd', 180, 'NiceBurger', '10018 Gilbert Rd'),
       ('Sheraton', '4606 Ferguson Rd', 300, 'Ginger', '4666 Ferguson Rd');

```