

CPSC 304 Project Cover Page

Milestone #: 2

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Group Number: 104

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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.)

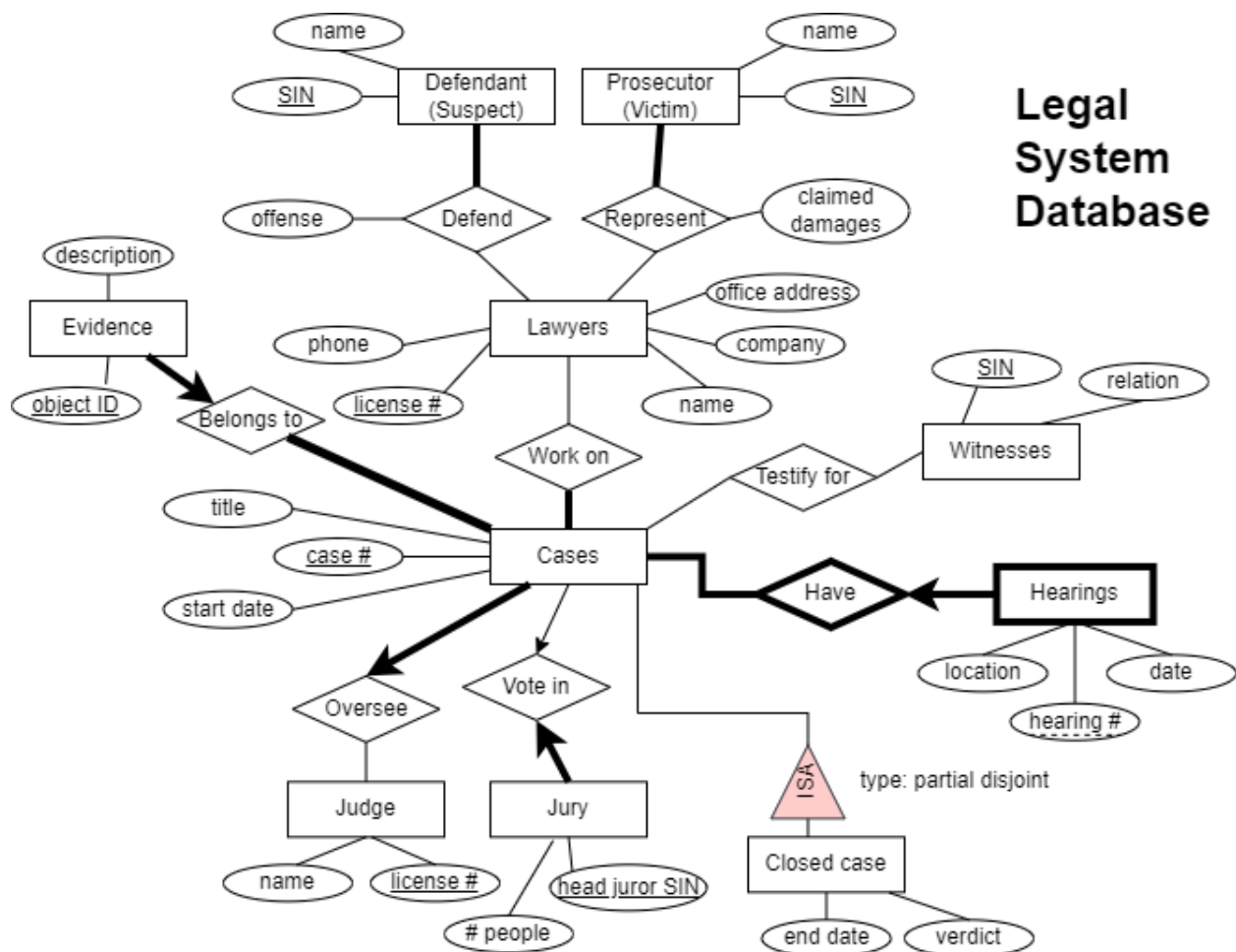
In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia.

Brief (2-3 sentence) summary of project

We are modeling a legal system, specifically court cases and their associated information. For example, in a murder case, you could store the victim and perpetrator's information as well as their respective lawyers, who the judges, jury, and witnesses are, as well as the state of the case and when and where the hearings were held.

ER Diagram

Changes: added "Evidence" entity and corresponding attributes, as well as an office address for lawyers



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Schema derived from above ER diagram

Note to TA: **bolded = foreign key, underlined = primary key, *italics* = not null

**Candidate key and unique are specified below

Defendant(SIN: int[9], *name*: varchar)

Prosecutor(SIN: int[9], *name*: varchar)

Defend(SIN: int[9], license#: char[5], *offense*: varchar)

Represent(SIN: int[9], license#: char[5], *claimed damages*: varchar)

Lawyers(license#: char[5], *phone*: int[10], *name*: varchar, *company*: varchar, *office address*: varchar)

Witness(SIN: int[9], *relation*: varchar)

WorkOn(license#: char[5], case#: char[5])

TestifyFor(SIN: int[9], case#: char[5])

EvidenceBelongingTo(object_id: char[5], *description*: varchar, *case#*: char[5])

**Note: changed name to represent merging the Evidence and Belongs To tables

JudgedCases(case#: char[5], *title*: varchar, *start date*: date, *license#*: char[5])

**Note: changed name to represent merging Cases and Oversee

CaseHearings(hearing#: char[5], *location*: varchar, *date*: date, case#: char[5])

Other candidate key: case# + location + date

**Note: changed name to represent merging Hearings and Have

Judge(license#: char[5], *name*: varchar)

CaseJury(head juror SIN: char[5], *#people*: int[2], *case#*: char[5])

Unique: case#

**Note: changed name to represent merging Jury and Vote In

ClosedCase(case#: char[5], *EndDate*: date, *Verdict*: bool)

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Functional Dependencies

**WorkOn, TestifyFor, and ClosedCase do not have functional dependencies for their attributes

Defendant

defendant SIN \rightarrow defendant name

Prosecutor

prosecutor SIN \rightarrow prosecutor name

Defend

SIN, license # \rightarrow offense

Represent

SIN, license # \rightarrow claimed damages

Lawyers

lawyer license # \rightarrow phone

lawyer license # \rightarrow company

lawyer license # \rightarrow lawyer name

company \rightarrow phone

company \rightarrow office address

Witness

witness SIN \rightarrow relation

EvidenceBelongingTo

object ID \rightarrow description

object ID \rightarrow case #

object ID \rightarrow case title

object ID \rightarrow case start date

object ID \rightarrow judge name

object ID \rightarrow judge license #

JudgedCases

case # \rightarrow case title

case # \rightarrow case start date

case # \rightarrow judge name

case # \rightarrow judge license #

CaseHearings

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hearing#, case # → date

hearing#, case # → location

case#, location, date → hearing#

Judge

judge license# → name

CaseJury

head juror SIN → # people

head juror SIN → case #

head juror SIN → case title

head juror SIN → case start date

head juror SIN → judge name

head juror SIN → judge license #

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Normalization

** Only the lawyer table has changed, since that is the only table with non-PK and CK functional dependencies, thus the only one not in BCNF. This is highlighted for easy marking.

Defendant(SIN: int[9], *name*: varchar)

Prosecutor(SIN: int[9], *name*: varchar)

Defend(SIN: int[9], license#: char[5], *offense*: varchar)

Represent(SIN: int[9], license#: char[5], *claimed damages*: varchar)

Lawyers(license#: char[5], *name*: varchar, **company**: varchar)

LawyerCompanyPhone(company: varchar, *phone*: int)

LawyerCompanyAddress(company: varchar, *office address*: varchar)

Steps taken for normalization

1. Start with the original table: Lawyers(license#: char[5], *phone*: int, *name*: varchar, *company*: varchar, *office address*: varchar). Functional dependencies given below.
 - a. lawyer license # \rightarrow phone
 - b. lawyer license # \rightarrow company
 - c. lawyer license # \rightarrow lawyer name
 - d. company \rightarrow phone
 - e. company \rightarrow office address
2. Decompose due to the FD (company \rightarrow phone), since the closure of company is not a superkey.
 - a. New tables are:
 - i. Lawyers(company: char[20], phone: int[20])
 - ii. Lawyers(license#: char[20], *name*: char[20], company: char[20], office address: char[20])
3. The second new table is still not in BCNF. Decompose due to the FD (company \rightarrow office address), since the closure of company is not a superkey
 - a. Final tables (all in BCNF):
 - i. LawyerCompanyPhone(company: char[20], phone: int[20])
 - ii. LawyerCompanyAddress(company: char[20], office address: char[20])
 - iii. Lawyer(license#: char[20], *name*: char[20], company: char[20])

Witness(SIN: int[9], *relation*: varchar)

WorkOn(license#: char[5], case#: char[5])

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TestifyFor(SIN: int[9], case#: char[5])

EvidenceBelongingTo(ObjectID: char[5], *description*: varchar, **case#**: char[5])

****Note:** changed name to represent merging the Evidence and Belongs To tables

JudgedCases(case#: char[5], title: varchar, start date: date, **license#**: char[5])

****Note:** changed name to represent merging Cases and Oversee

CaseHearings(hearing#: char[5], location: varchar, date: date, case#: char[5])

Other candidate key: case# + location + date

****Note:** changed name to represent merging Hearings and Have

Judge(license#: char[5], *name*: varchar)

CaseJury(head juror SIN: char[5], #people: int[2], **case#**: char[5])

Unique: case#

****Note:** changed name to represent merging Jury and Vote In

ClosedCase(case#: char[5], EndDate: date, Verdict: bool)

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```
CREATE TABLE LawyerCompanyAddress(company VARCHAR PRIMARY KEY,  
                                     office_address VARCHAR,  
                                     FOREIGN KEY (company)  
                                     REFERENCES LawyerCompanyPhone(company)  
                                     ON DELETE CASCADE)
```

```
CREATE TABLE Witness(sin INT(9) PRIMARY KEY,  
                      relation VARCHAR NOT NULL)
```

```
CREATE TABLE WorkOn(case# CHAR(5),  
                     license# CHAR(5),  
                     PRIMARY KEY (case#, license#),  
                     FOREIGN KEY (case#)  
                     REFERENCES JudgedCases(case#)  
                     ON DELETE CASCADE  
                     FOREIGN KEY (license#)  
                     REFERENCES Lawyers(license#)  
                     ON DELETE CASCADE)
```

```
CREATE TABLE TestifyFor(sin INT(9),  
                         case# CHAR(5),  
                         PRIMARY KEY (sin, case#),  
                         FOREIGN KEY (sin)  
                         REFERENCES Witness(sin)  
                         ON DELETE CASCADE  
                         FOREIGN KEY (case#)  
                         REFERENCES JudgedCases(case#)  
                         ON DELETE CASCADE)
```

```
CREATE TABLE EvidenceBelongingTo(object_id CHAR(5),  
                                   description VARCHAR,  
                                   case# CHAR(5),  
                                   PRIMARY KEY (case#, license#),  
                                   FOREIGN KEY (case#)  
                                   REFERENCES JudgedCases(case#)  
                                   ON DELETE CASCADE)
```

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```
CREATE TABLE JudgedCases(case# CHAR(5) PRIMARY KEY ,
                           title VARCHAR,
                           start_date DATE,
                           license# CHAR(5),
                           FOREIGN KEY (license#)
                           REFERENCES Judge(license#)
                           ON DELETE CASCADE)
```

```
CREATE TABLE CaseHearings(hearing# CHAR(5) ,
                             location VARCHAR,
                             date DATE,
                             case# CHAR(5),
                             PRIMARY KEY(hearing#, case#),
                             FOREIGN KEY (case#)
                             REFERENCES JudgedCases(case#)
                             ON DELETE CASCADE)
```

```
CREATE TABLE Judge(license# CHAR(5) PRIMARY KEY,
                     name VARCHAR NOT NULL)
```

```
CREATE TABLE CaseJury(head_juror_sin INT(9) PRIMARY KEY,
                        #people INT(2),
                        case# CHAR(5) UNIQUE,
                        FOREIGN KEY (case#)
                        REFERENCES JudgedCases(case#)
                        ON DELETE CASCADE)
```

```
CREATE TABLE ClosedCase(verdict BOOL,
                           end_date DATE,
                           case# CHAR(5) PRIMARY KEY,
                           FOREIGN KEY (case#)
                           REFERENCES JudgedCases(case#)
                           ON DELETE CASCADE)
```

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Insert Statements

```
INSERT  
INTO Defendant(sin, name)  
VALUES (123456789, 'Jordon Johnson')
```

```
INSERT  
INTO Defendant(sin, name)  
VALUES (987654321, 'Rachel Pottinger')
```

```
INSERT  
INTO Defendant(sin, name)  
VALUES (112233445, 'Steve Wolfman')
```

```
INSERT  
INTO Defendant(sin, name)  
VALUES (112233456, 'Geoffrey Tien')
```

```
INSERT  
INTO Defendant(sin, name)  
VALUES (112234567, 'Gregor Kizcales')
```

```
INSERT  
INTO Prosecutor(sin, name)  
VALUES (111111111, 'Adam Ant')
```

```
INSERT  
INTO Prosecutor(sin, name)  
VALUES (222222222, 'Bob Bridge')
```

```
INSERT  
INTO Prosecutor(sin, name)  
VALUES (333333333, 'Cathy Car')
```

```
INSERT  
INTO Prosecutor(sin, name)  
VALUES (444444444, 'Doug Dog')
```

```
INSERT
```

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INTO Prosecutor(sin, name)

VALUES (555555555, 'Edward Egg')

INSERT

INTO Defend(sin, license#, offense)

VALUES (123456789, '11111', 'Referenced Hitchhiker's Guide to the Galaxy one too many times')

INSERT

INTO Defend(sin, license#, offense)

VALUES (987654321, '22222', 'Created too many databases')

INSERT

INTO Defend(sin, license#, offense)

VALUES (112233445, '33333', 'Leaving lego bricks on the ground')

INSERT

INTO Defend(sin, license#, offense)

VALUES (112233456, '44444', 'Jaywalking')

INSERT

INTO Defend(sin, license#, offense)

VALUES (112234567, '55555', 'Pineapple on pizza')

INSERT

INTO Represent(sin, license#, claimed_damages)

VALUES (111111111, '55555', 'copyright claims')

INSERT

INTO Represent(sin, license#, claimed_damages)

VALUES (222222222, '44444', 'data overflow')

INSERT

INTO Represent(sin, license#, claimed_damages)

VALUES (333333333, '33333', 'unimaginable pain')

INSERT

INTO Represent(sin, license#, claimed_damages)

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VALUES (4444444444, '22222' , 'dented car')

INSERT

INTO Represent(sin, license#, claimed_damages)

VALUES (5555555555, '11111' , 'unrepairable mental trauma')

INSERT

INTO Lawyers(license#, name, company)

VALUES ('11111', 'Scott Owen', 'Kent & Smith')

INSERT

INTO Lawyers(license#, name, company)

VALUES ('22222', 'Cindy Low', 'Peterson Association')

INSERT

INTO Lawyers(license#, name, company)

VALUES ('33333', 'Jane Gooden', 'Sam & Associates')

INSERT

INTO Lawyers(license#, name, company)

VALUES ('44444', 'Larry Joe', 'Lane & Bond')

INSERT

INTO Lawyers(license#,name, company)

VALUES ('55555', 'Steve Kid', 'Sullivan Group')

INSERT

INTO LawyerCompanyPhone(company, phone)

VALUES ('Kent & Smith', 1111111111)

INSERT

INTO LawyerCompanyPhone(company, phone)

VALUES ('Peterson Association', 2222222222)

INSERT

INTO LawyerCompanyPhone(company, phone)

VALUES ('Sam & Associates', 3333333333)

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```
INSERT  
INTO LawyerCompanyPhone(company, phone )  
VALUES ('Lane & Bond', 4444444444)
```

```
INSERT  
INTO LawyerCompanyPhone(company, phone )  
VALUES ('Sullivan Group', 5555555555)
```

```
INSERT  
INTO LawyerCompanyAddress(company, office_address )  
VALUES ('Kent & Smith', '12 Main Street, Van' )
```

```
INSERT  
INTO LawyerCompanyAddress(company, office_address )  
VALUES ('Peterson Association', '13 Main Street, Van' )
```

```
INSERT  
INTO LawyerCompanyAddress(company, office_address )  
VALUES ('Sam & Associates', '14 Main Street, Van' )
```

```
INSERT  
INTO LawyerCompanyAddress(company, office_address )  
VALUES ('Lane & Bond', '15 Main Street, Van' )
```

```
INSERT  
INTO LawyerCompanyAddress(company, office_address )  
VALUES ('Sullivan Group', '16 Main Street, Van' )
```

```
INSERT  
INTO Witness(sin, relation)  
VALUES (205893055, 'Random dude walking on the street')
```

```
INSERT  
INTO Witness(sin, relation)  
VALUES (104859039, 'Unsuspecting TA')
```

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```
INSERT  
INTO Witness(sin, relation)  
VALUES (273940683, 'Steve Wolfman (Husband)')
```

```
INSERT  
INTO Witness(sin, relation)  
VALUES (950302740, 'Italian person')
```

```
INSERT  
INTO Witness(sin, relation)  
VALUES (208475950, 'Pizza connoisseur')
```

```
INSERT  
INTO WorkOn(license#, case#)  
VALUES ('a1', '23')
```

```
INSERT  
INTO WorkOn(license#, case#)  
VALUES ('a2', '7634')
```

```
INSERT  
INTO WorkOn(license#, case#)  
VALUES ('a3', '123')
```

```
INSERT  
INTO WorkOn(license#, case#)  
VALUES ('a4', '345')
```

```
INSERT  
INTO WorkOn(license#, case#)  
VALUES ('a5', '4490')
```

```
INTO WorkOn(license#, case#)  
VALUES ('a1', '1')
```

```
INSERT  
INTO WorkOn(license#, case#)  
VALUES ('a2', '2')
```

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```
INSERT  
INTO WorkOn(license#, case#)  
VALUES ('a3', '3')
```

```
INSERT  
INTO WorkOn(license#, case#)  
VALUES ('a4', '4')
```

```
INSERT  
INTO WorkOn(license#, case#)  
VALUES ('a5', '5')
```

```
INSERT  
INTO TestifyFor(sin, case#)  
VALUES ('205893055', '1')
```

```
INSERT  
INTO TestifyFor(sin, case#)  
VALUES ('104859039', '23')
```

```
INSERT  
INTO TestifyFor(sin, case#)  
VALUES ('273940683', '4')
```

```
INSERT  
INTO TestifyFor(sin, case#)  
VALUES ('950302740', '7634')
```

```
INSERT  
INTO TestifyFor(sin, case#)  
VALUES ('208475950', '345')
```

```
INSERT  
INTO EvidenceBelongingTo(object_id, description, case#)  
VALUES ('2331', 'A smol knife', '23')
```

```
INSERT
```


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```
INSERT INTO EvidenceBelongingTo(object_id, description, case#)
VALUES ('2332', 'Towel', '23')
```

```
INSERT INTO EvidenceBelongingTo(object_id, description, case#)
VALUES ('2441', 'Canvas course page', '7634')
```

```
INSERT INTO EvidenceBelongingTo(object_id, description, case#)
VALUES ('356', 'Fingerprints on lego bricks', '123')
```

```
INSERT INTO EvidenceBelongingTo(object_id, description, case#)
VALUES ('2661', 'Pizza', '345')
```

```
INSERT INTO EvidenceBelongingTo(object_id, description, case#)
VALUES ('2662', 'Open can of pineapples', '345')
```

```
INSERT INTO EvidenceBelongingTo(object_id, description, case#)
VALUES ('2771', 'Traffic camera footage', '4490')
```

```
INSERT INTO EvidenceBelongingTo(object_id, description, case#)
VALUES ('fds', 'Footprint', '1')
```

```
INSERT INTO EvidenceBelongingTo(object_id, description, case#)
VALUES ('gfd', 'Glove', '2')
```

```
INSERT INTO EvidenceBelongingTo(object_id, description, case#)
VALUES ('jhg', 'Broken mouse', '3')
```

```
INSERT INTO EvidenceBelongingTo(object_id, description, case#)
VALUES ('ewq', 'Surveillance footage', '4')
```

```
INSERT INTO EvidenceBelongingTo(object_id, description, case#)
```

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VALUES ('kop', 'Traffic camera footage', '5')

INSERT
INTO JudgedCases(case#, title, start date, license#)
VALUES ('23', 'Johnson VS Ant', '2021-11-21', 'b1')

INSERT
INTO JudgedCases(case#, title, start date, license#)
VALUES ('7634', 'Pottinger VS Bridge', '2020-12-21', 'b2')

INSERT
INTO JudgedCases(case#, title, start date, license#)
VALUES ('123', 'Wolfman VS Car', '2019-12-21', 'b3')

INSERT
INTO JudgedCases(case#, title, start date, license#)
VALUES ('356', 'Tien VS Dog', '2021-12-11', 'b4')

INSERT
INTO JudgedCases(case#, title, start date, license#)
VALUES ('4490', 'Kizcales VS Egg', '2021-12-26', 'b5')

INSERT
INTO JudgedCases(case#, title, start date, license#)
VALUES ('1', 'The Cool Case', '2021-10-21', 'b1')

INSERT
INTO JudgedCases(case#, title, start date, license#)
VALUES ('2', 'The Weird Case', '2021-11-21', 'b2')

INSERT
INTO JudgedCases(case#, title, start date, license#)
VALUES ('3', 'The Epic Case', '2021-11-11', 'b3')

INSERT
INTO JudgedCases(case#, title, start date, license#)
VALUES ('4', 'The Quality Case', '2021-2-21', 'b4')

INSERT

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```
INTO JudgedCases(case#, title, start date, license#)
VALUES ('5', 'The Sad Case', '2021-3-21', 'b5')
```

```
INSERT
INTO CaseHearings(Hearing#, location, date, case#)
VALUES ('11', '1 East Ave, Van', '2021-12-21', '23')
```

```
INSERT
INTO CaseHearings(Hearing#, location, date, case#)
VALUES ('22', '2 East Ave, Van', '2021-12-21', '7634')
```

```
INSERT
INTO CaseHearings(Hearing#, location, date, case#)
VALUES ('33', '3 East Ave, Van', '2021-12-21', '123')
```

```
INSERT
INTO CaseHearings(Hearing#, location, date, case#)
VALUES ('44', '4 East Ave, Van', '2021-12-21', '356')
```

```
INSERT
INTO CaseHearings(Hearing#, location, date, case#)
VALUES ('55', '5 East Ave, Van', '2021-12-21', '4490')
```

```
INSERT
INTO CaseHearings(Hearing#, location, date, case#)
VALUES ('1', '6 East Ave, Van', '2021-12-21', '1')
```

```
INSERT
INTO CaseHearings(Hearing#, location, date, case#)
VALUES ('2', '7 East Ave, Van', '2021-12-22', '2')
```

```
INSERT
INTO CaseHearings(Hearing#, location, date, case#)
VALUES ('3', '8 East Ave, Van', '2021-12-23', '3')
```

```
INSERT
INTO CaseHearings(Hearing#, location, date, case#)
VALUES ('4', '1 East Ave, Van', '2021-12-24', '4')
```

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INSERT

INTO CaseHearings(Hearing#, location, date, case#)

VALUES ('5', '1 East Ave, Van', '2021-12-25', '5')

INSERT

INTO Judge(license#, name)

VALUES ('b1', 'Albert Wu')

INSERT

INTO Judge(license#, name)

VALUES ('b2', 'Ben Carter')

INSERT

INTO Judge(license#, name)

VALUES ('b3', 'Chloe Williams')

INSERT

INTO Judge(license#, name)

VALUES ('b4', 'Dora Potter')

INSERT

INTO Judge(license#, name)

VALUES ('b5', 'Elenor Denman')

INSERT

INTO Jury(head_juror_sin, #people, case#)

VALUES (121314156, 12, '1')

INSERT

INTO Jury(head_juror_sin, #people, case#)

VALUES (232425267, 14, '23')

INSERT

INTO Jury(head_juror_sin, #people, case#)

VALUES (113355779, 12, '7634')

INSERT

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```
INTO Jury(head_juror_sin, #people, case#)
VALUES (224466880, 12, '5')
```

```
INSERT
INTO Jury(head_juror_sin, #people, case#)
VALUES (131517190, 14, '345')
```

```
INSERT
INTO ClosedCase(case#, end_date, verdict)
VALUES ('1', '2022-12-21', true)
```

```
INSERT
INTO ClosedCase(case#, end_date, verdict)
VALUES ('2', '2122-12-20', true)
```

```
INSERT
INTO ClosedCase(case#, end_date, verdict)
VALUES ('3', '2031-12-1', false)
```

```
INSERT
INTO ClosedCase(case#, end_date, verdict)
VALUES ('4', '2023-12-21', false)
```

```
INSERT
INTO ClosedCase(case#, end_date, verdict)
VALUES ('5', '2024-12-21', true)
```