The Progressive County Court (PCC) wishes to automate its processes for selecting jurors, assigning cases to judges, and tracking court cases. Your job, as DBA, is to create the schema and subschemas for these automated systems.

#### Citizen Information System (CIS)

The Citizen Information System (CIS) uses information from multiple sources (state driving registration, voting registration, property records) to create a master database of citizens (potential jurors). The original source data is not maintained by the court system. The citizen database includes the name and home address of each citizen. Additionally, it records the driver's license number (if known) and the voter registration number (if known). CIS also records (possibly generates) a unique citizen ID for each citizen.

**Citizen(citizenId, name, address,driverLicNr, voterId, lastScreeningDt, screenDueDt, lastPanelDt)**

To help with screening of jurors and to reduce citzens' time spent at the Progressive County court house, PCC decided to screen potential jurors based on their responses to a standard list of thirty questions. Weekly, CIS produces a **citizen information screening list** which includes each juror's citizen ID and the date by which the citizen must provide answers to the screening questions. CIS also uses these citizen information screening records to prevent sending a citizen screening questions more than once a year. The screening questions are sent to the citizen's home address. CIS only needs the last screening date.

CIS records the responses of citizens to the screening questions. For each question, the citizen responds with an answer on a scale from 1 to 5. Only one set of the responses to the thirty questions is recorded for each citizen. Any prior responses by a citizen are deleted when new responses are received.

**Screen(citizenId, question,answer )**

**citizenId,question -> answer**

#### Court Assignment System (CAS)

The Court Assignment System (CAS) records information about each court case and assigns judges and courts.

Court cases are recorded by a **Case Number**. For each court case, CAS records the citizen ID of the accused person, the prosecuting lawyer, defense lawyer, a description of the case, and the date that this case could be *ready* to go to court. Note that lawyers work on many cases. A person could be the accused for many cases. Added at different paragraphs

**Case(caseNr, citizenId, prosLawyer, defLawyer, description, readyDt, courtDt, court, verdict)**

Judges are assigned to **courts** based on their availability. CAS tracks the availability of judges by date. A judge might be unavailable due to vacation time or other activity. A judge may also be unavailable due to his assignment to a court on a particular date. A court may have multiple judges assigned; however on a particular date, only one judge is assigned to the court.

**Avail(judge, date, availCd)**

**judge, date -> availCd**

**Court(court,courtDt,judge)**

**Court, courtDt -> judge**

CAS also assigns each case to a court for a particular date. Multiple cases can be assigned to a court on a particular date.

**Panel Screening System (PSS)**

To help in screening and assigning a panel (potential jurors) to a court case, the prosecuting and defense lawyers are allowed to provide answers to ten questions which will be used to *screen* citizens for their case.

**LawyerScreen(caseNr, lawyer, question, answer)**

**caseNr, lawyer, question -> answer**

PSS uses a merging process to select a panel of forty citizens based on the citizen responses (see CIS) and *screen*ing answers from each lawyer for each case. If a citizen was placed on a panel in the past six months, PSS will not include him/her in a new panel.

**Panel(caseNr, citizenId)**

**(Multivalue dependency)**

**MVD caseNr ->> citizenId**

Each citizen in the panel is mailed a jury duty notification which tells the citizen when he is expected to report for jury duty and where to report (the court).

**Where can we get this info?**

**Case, Panel, Citizen**

**Jury Selection System (JSS)**

The Jury Selection System (JSS) selects the jurors (citizens) for the court case from the panel. Each lawyer is allowed to question the panel and can strike seven jurors. The list of jurors that each lawyer *strikes* is recorded for the case. JSS removes citizens who the lawyers strike from consideration for the jury. From the remaining citizens on the panel, PSS randomly selects and records the jury.

**Strike(caseNr, lawyer, citizenId)**

**MVD caseNr, lawyer - >> citizenId**

**Juror(caseNr, juror)**

**MVD caseNr ->> juror**

**Verdict System (VS)**

The verdict system records the verdict (guilty or not guilty) for each court case, and records the punishment. There are three types of punishment:

**Jail Time** The guilty citizen ID, minimum jail time, maximum jail time, case number, and start date are recorded.

**Fine** The guilty citizen ID, date for the fine, case number, and fine amount are recorded. Addtionally, when paid, the payment amount and payment date are recorded. Partial payments are not accepted.

**Community Service** The guilty citizen ID, type of community service, case number, and date(s) for the community service.

Due to being guilty of many crimes, citizens can have many guilty verdicts.

**JailTime(citizenId, startDt, minJailTime, maxJailTime, caseNr)**

**citizenId, startDt -> minJailTime, maxJailTime, caseNr**

**Fine(citizenId, fineDt, caseNr, fineAmt, payAmt, paymentDt)**

**citizenId, fineDt -> caseNr, fineAmt, payAmt, paymentDt**

**CommSvc(citizenId, svcDt, commSvcType, caseNr)**

**citizenId, svcDt -> commSvcType, caseNr**

**State your assumptions**

Use the **Relational Model** to show each relation (minimizing redundancy) without a loss of informaiton. For each relation, show:

* Relation Name
* Each of the attributes with the key underlined
* FDs
* MVDs

**Citizen(citizenId, name, address,driverLicNr, voterId, lastScreeningDt, screenDueDt, lastPanelDt**

**citizenId -> name, address,driverLicNr, voterId, lastScreeningDt, screenDueDt, lastPanelDt**

**Screen(citizenId, question,answer )**

**citizenId,question -> answer**

**Case(caseNr, citizenId, prosLawyer, defLawyer, description, readyDt, courtDt, court, verdict)**

**caseNr -> citizenId, prosLawyer, defLawyer, description, readyDt, courtDt, court, verdict**

**Avail(judge, date, availCd)**

**judge, date -> availCd**

**Court(court,courtDt,judge)**

**Court, courtDt -> judge**

**LawyerScreen(caseNr, lawyer, question, answer)**

**caseNr, lawyer, question -> answer**

**Panel(caseNr, citizenId)**

**MVD caseNr ->> citizenId**

**Strike(caseNr, lawyer, citizenId)**

**MVD caseNr, lawyer - >> citizenId**

**Juror(caseNr, juror)**

**MVD caseNr ->> juror**

**JailTime(citizenId, startDt, minJailTime, maxJailTime, caseNr)**

**citizenId, startDt -> minJailTime, maxJailTime, caseNr**

**Fine(citizenId, fineDt, caseNr, fineAmt, payAmt, paymentDt)**

**citizenId, fineDt -> caseNr, fineAmt, payAmt, paymentDt**

**CommSvc(citizenId, svcDt, commSvcType, caseNr)**

**citizenId, svcDt -> commSvcType, caseNr**