CMPE232 - RELATIONAL DATABASES

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PROJECT PHASE 2

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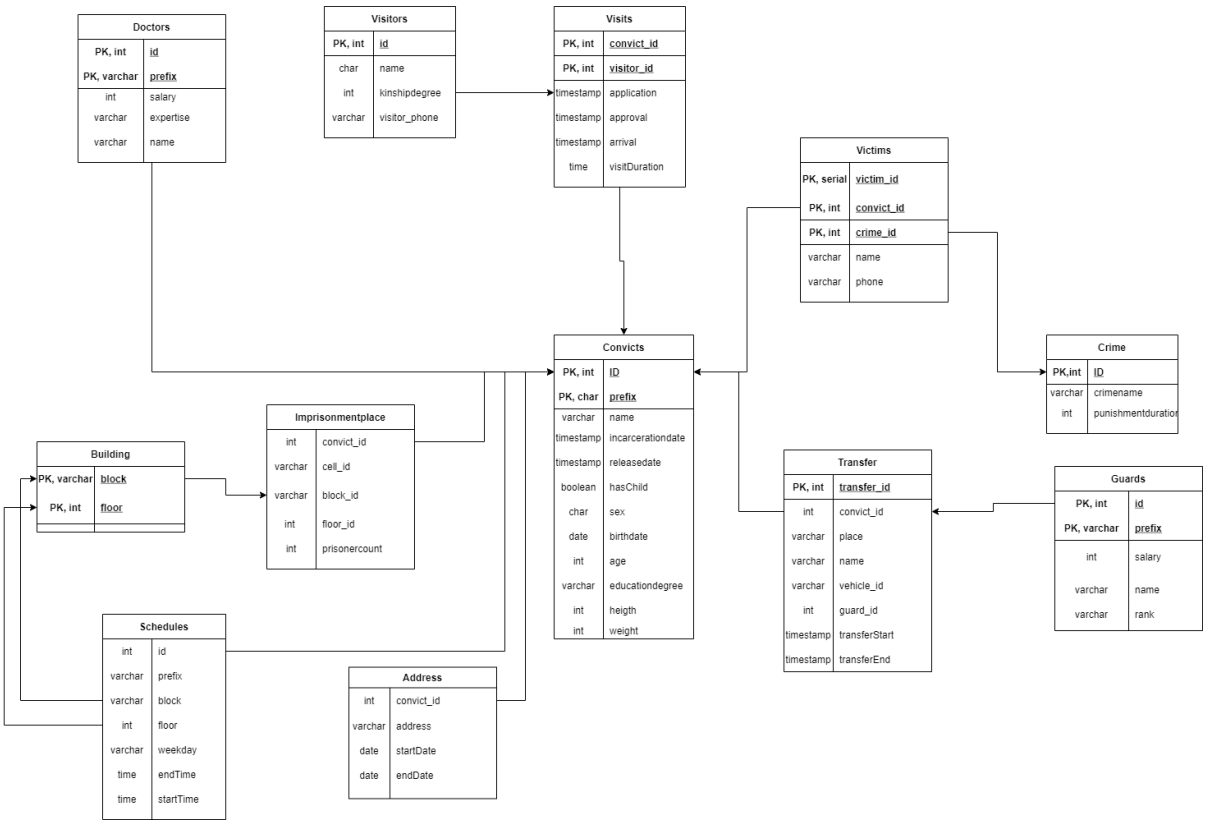
- **Entity 1, Convicts:** will be identified by their ID number. ID will be their primary key. Their profilic data will be extracted by their id, names, incarceration date, release date, haschild, sex, age, birthdate, height and width. Moreover, the educational level is going to be held to ease the selecting the candidates for in-prison duties. For instance, if the convict was a chef before, in prison duties might be offered. Lastly, from the table, it could be seen that there are two derived attributes, namely, age and release date. These might be removed on upcoming versions as they can be calculated directly.
- **Entity 2, Guards:** will be identified by their ID number. ID will be the primary key. They will have the attributes as following: title, name, address, unit, salary, rank, phone.
- **Entity 3, Doctors:** will be identified by their ID number. Similar to guards, pretty standard attributes will be created as ID, name, salary, expertise, phone.
- **Entity 4, Building:** will be identified by their ID number. As there are numerous buildings for special purposes their design will differ. Therefore, they should have different amount of floor levels. Because of that, floor attribute which denote the floors is added. This way it is possible to get maximum amount of floor by count() function as well as access to the floor levels.
- **Entity 5, Imprisonment Place**: Each cell is found inside of a floor level in block. Cells will be defined by their codes. As only convicts can stay in the cells, convicts and imprisonment place will have a relation. Also, it is known that there are cells inside some buildings but not all so building have a relation with imprisonment place.
- **Entity 6, Visitors:** Visitors will have a separate table and it will be closely related to the prisoners. It is possible to assume they will be weak entities because their existence depends on the convict. If a visitor is added to the table, the visitorID will be related with the convict ID. visitorID is a primary key while others are just attributes, name and phone. Additionally, official application date for the visit will be recorded in another relation, connecting convicts and visitors, called “visits”. If the permission is given, then the date and hour of arrival is going to be given to the relative in “visits” table.
- **Entity 7, Schedules:** Schedules of the guards, health workers and convicts will be stored in this table. The ID of every person will be pulled from their own table. Interestingly this introduces a problem. If the people with same ID but different group is to be inserted into the schedule table loss of information would occur. To solve this issue, every convict, guard and health worker will have a group prefix. For example, convicts IDs are going to be started by ‘c’ like ‘c1, c2, c3...’. Also, it will be storing datetime variables, duty hours, days.
- **Entity 8, Transfer:** This table will keep information about the transfer data of the convicts. Where, when, how, they transferred and who escort them. So, attributes will be date, vehicle code, escort ID, and transfer ID which is primary key.
- **Entity 9, Victim:** Victim table will be defined with two primary keys; Convicts ID and Crime ID. That means we can reach the convicts’ crime(s) and in case of more than one crime occurrence, with the Crime ID we can specify the desired result.
- **Entity 10, Crime:** Crime table stores all crimes committed by the criminals. The primary key will be the Crime ID and foreign key will be the convicts’ ID. As attributes, place of the crime, date and time, and name will be stored.

Changes:

1. Name entity is deleted due to fact that the new design gives easier access to name variable while writing queries. Yet, the name attribute is now limited to 50 characters.
2. Phone numbers entity is deleted because again we wanted to easier access to phone number variable while writing queries. This is done for simplicity's sake but it assumes everyone will have only one phone number.
3. The variables "application", "approval", "arrival" found in visitors entity was moved to visits entity. It was not logical keeping them in previous table because it limited the ability for one visitor to visit convicts many times. If the visitor needed to visit convict a second time, then the names and phone number had to be entered numerous times, causing duplicated.
4. The unique identifier of floor variable from building entity deleted. If there are at least 10 data in building entity, some building can have same total floor number. The unique identified prevented inserting same character. For example, building with ID=1 could have an A block but also building with ID=2 needs to have A block. With unique that was not possible.
5. From victims entity, variable Victim_name changed to name. "Victim" word was unnecessary.
6. From victims entity, variable Victim_phone changed to phone. "Victim" word was unnecessary.
7. Surname variable from convicts, merged with the variable "name" (fullname).



Java Explanation

This java application handles insert, update, delete and print for the database.

Insert: When the user enters 1 as input, insert function is executed. This has only been done for one table called convicts. The premade columns made it easier to enter values without getting dynamic number of columns and their types. The user prompted to enter the attribute values corresponding to convicts table. It starts by name and goes until weight.

Update: When 2 is entered as input, update function will execute. First of all, the user must enter the table name in order to do the operations. Then, the columns of that table are displayed to make it easier to choose what to change. After the table name, the conditions should be specified to not to change whole entries. This condition part is a basic SQL compatible predicate. It will bring a table that the update operation will take place on. Following the next input, the user must enter column names with one comma and one white space for separation. This indicates which columns will be set from the table that has been brought by predicate. Lastly, the user should enter the corresponding values for these columns.

Delete: Third option is the delete function for database. It deletes multiple rows in which the where clause is met. This operation accepts only one predicate denoted by where clause so it is more primitive when compared with update function but it is secure enough that user cannot delete every row. It starts by asking one column name and continues to ask a value for that column. Then, it deletes every row which is true for the predicate. The user must be careful and should use ID as main delete column. Otherwise, multiple entries will be deleted.

Print: This method works when user selects fourth option in menu. It asks for a table name to be printed and same as before, gives the column names to user. The user can decide to print all of the table but also can select specific attributes, too. After that, a predicate should be entered. It prints all the columns according to the order which match with the predicate.