

SHERLOCK'S ARCHIVE



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SCOPE:

Stores metadata about crimes, including case numbers, types (e.g., theft, murder), locations (e.g., addresses, coordinates), descriptions, statuses, and dates of occurrence.

Manages information about individuals involved in crimes, such as suspects, victims, witnesses, criminals, and investigators.

Records evidence and forensic analysis data, including collection details, types, and analysis results.

Facilitates case management by linking investigators to specific crimes.

Enables tracking of criminals' involvement in previous crimes for investigative purposes.



FUNCTIONAL REQUIREMENTS:

Scalability and Performance:

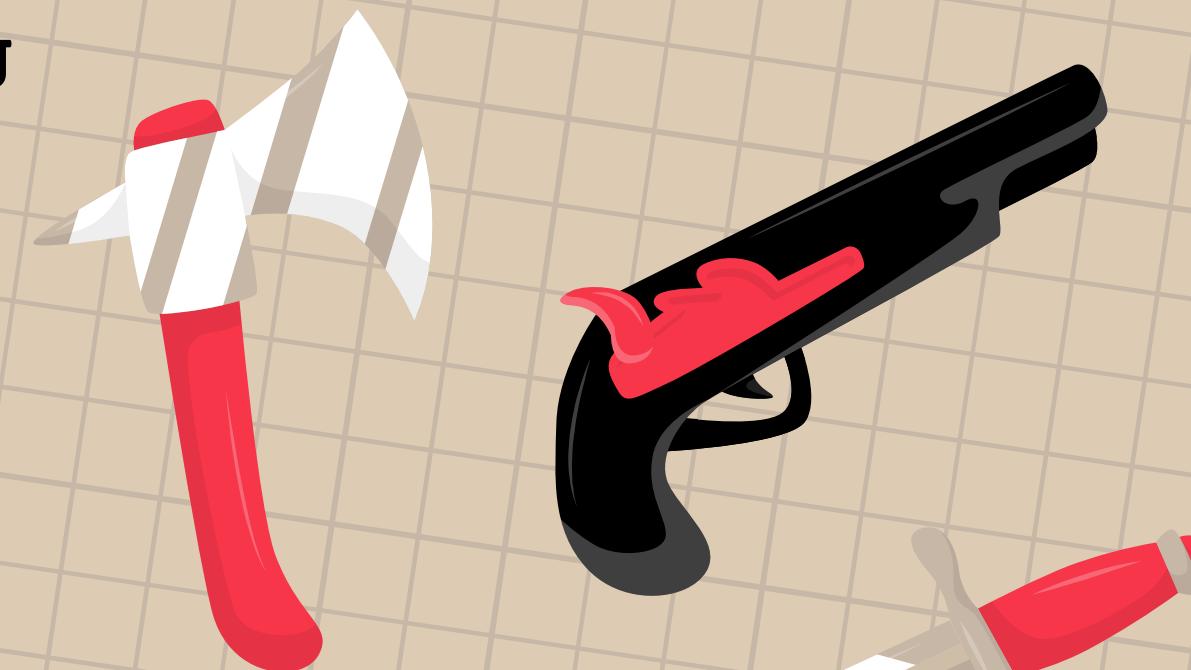
Ensure efficient handling of increasing data volumes while maintaining optimal search and retrieval performance.

Record Management:

Enable CRUD operations for crimes, individuals (suspects, victims, witnesses), evidence, and forensic analyses.



How did it happen?



Case Association:

Link investigators to specific crimes for efficient case management and tracking.

Relationship Management:

Associate evidence with crimes, criminals with previous offenses, and forensic analyses with evidence records.

TABLES:

crimes

Stores information about each crime, such as the case number, crime type, location, date occurred, and status

victims

Links victims to their corresponding crimes, including a statement from each victim.

humans

Contains details about humans involved in the database, which could include victims, witnesses, suspects, and investigators

criminals

Contains information about known criminals, including a general description.

witnesses

Links witnesses to their corresponding crimes, including a statement from each witness.

TABLES:

criminal_previous_crimes

Tracks the involvement of criminals in previous crimes, establishing a many-to-many relationship between criminals and crimes

case_investigators

Tracks which investigators are involved in which cases, establishing a many-to-many relationship between crimes and investigators.

investigators

Holds information about crime investigators, including their full name and badge number and status

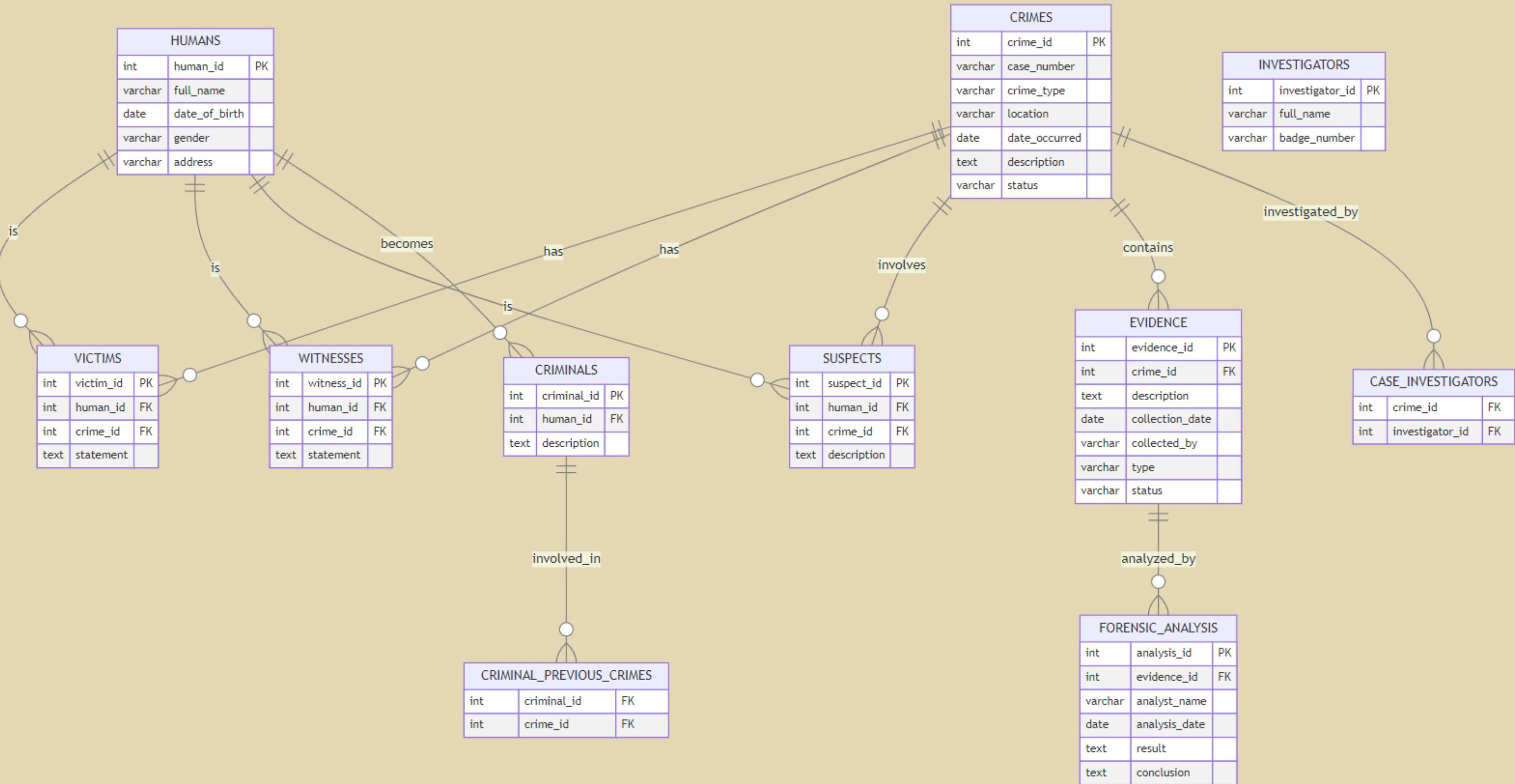
evidence

Stores details about evidence collected for each crime, including the type of evidence, collection date, and current status

forensic_analysis

Contains records of forensic analysis performed on evidence, including analyst names, analysis dates, results, and conclusions.

ER DIAGRAM:

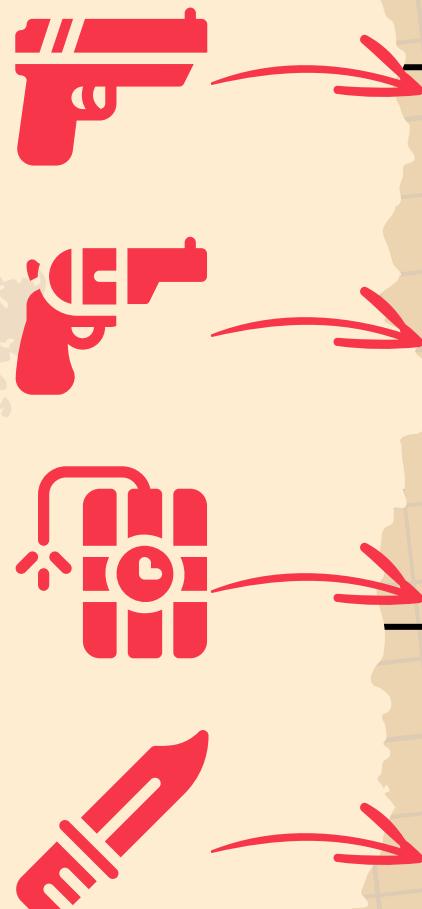


ONE TO MANY RELATIONSHIP



RELATIONSHIP

MANY TO MANY



CRIMINALS

CRIMES

to CRIMES through
CRIMINAL_PREVIOUS_CRIMES

to INVESTIGATORS through
CASE_INVESTIGATORS

TRIGGERS

Update Evidence Status Trigger (Collected):

Automatically updates the status of evidence to "Collected" when new records are inserted into the "forensic_analysis" table, indicating that the evidence has been analyzed.

Update Crime Status Trigger (Solved):

Automatically updates the status of crimes to "Solved" when new records are inserted into the "forensic_analysis" table, indicating that the forensic analysis has provided resolution to the crime.

Update Investigator Status Trigger (Active):

Updates the status of investigators to 'Active' when they are assigned to a new case in the "case_investigators" table. It ensures that investigators' status remains up-to-date based on their assignment to cases.

VIEWS

Crime_info view

combines data from the "crimes," "victims," "witnesses," and "suspects" tables, displaying crime details along with the names of involved individuals. By ordering the results by the date they occurred, investigators can quickly identify and prioritize recent incidents.

Evidence_info view

Consolidates information from the "evidence" and "forensic_analysis" tables, displaying evidence details along with the corresponding crime case number. This allows investigators to review evidence in the context of specific crimes, facilitating informed decision-making during investigations.

QUERIES

Retrieve all information about crimes that occurred in a specific location and are still pending.

List all suspects along with the crimes they are associated with, including the crime type and case number.

Find all victims of a particular crime type, ordered by the date the crime occurred.

- ✗ identify criminals with multiple offenses by listing their names and the number of crimes they are linked to, focusing on those linked to more than one crime.



Retrieve all evidence that has been collected for a specific case number, including the type of evidence and its current status.

List all witnesses who have provided statements for crimes in a specific location, including witness names and the corresponding crime case numbers.

Aggregate the number of crimes solved by each investigator, sorted by the most successful investigator first.

INDEXES

INDEX 1 → **INDEX 2** → **INDEX 3** → **INDEX 4**



idx_crimes_location

Established an index on the "location" column in the "crimes" table



idx_crimes_status

Constructed an index on the "status" column in the "crimes" table



idx_victims_crime_id

Implemented an index on the "crime_id" column in the "victims" table



idx_suspects_crime_id

Established an index on the "crime_id" column in the "suspects" table

ASSUMPTIONS

Case Independence

It assumes that each crime investigation is independent of others, without considering potential connections or overlaps between different cases that may require cross-referencing or collaborative analysis.

User Access

It assumes that authorized users have access to the necessary functionalities and data within the database, while unauthorized access is restricted.

Data Consistency

The database assumes that data across different tables or entities remains consistent and coherent, ensuring that related information accurately reflects the same reality.

01

Handling Complex Crimes

The database may struggle to effectively break down and analyze highly intricate or multi-faceted crimes involving numerous perpetrators, victims, and interconnected events.

02

Interconnected Relationships:

Crimes with complex relationships between entities, such as conspiracy cases involving multiple layers of involvement, may pose challenges in accurately representing and managing the interconnectedness within the database.

03

Difficulty in Case Classification

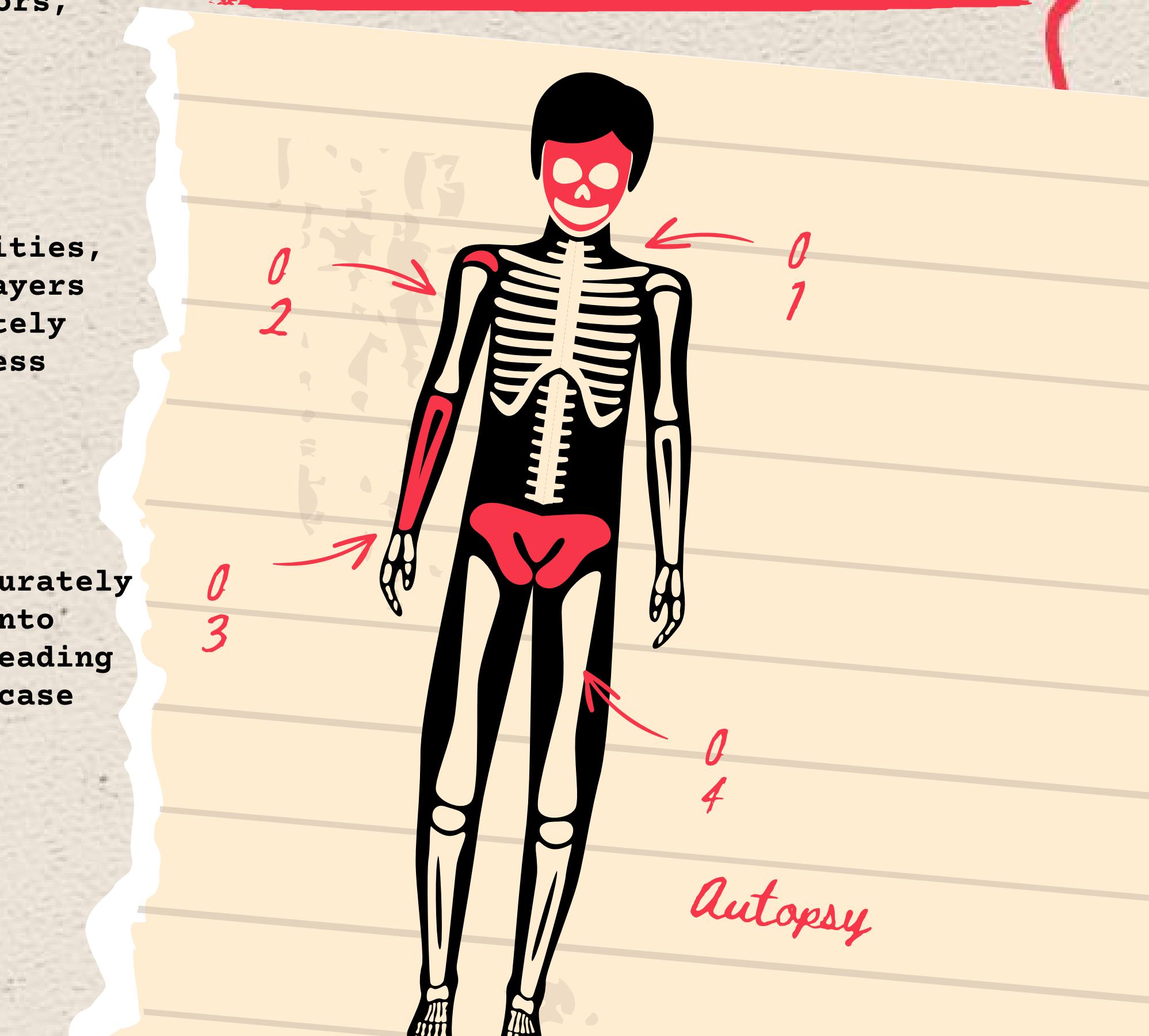
The database may encounter challenges in accurately categorizing and classifying complex crimes into predefined types or categories, potentially leading to misinterpretation or misrepresentation of case details.

04

Limited Data Sources

The database relies primarily on manual data entry, which may lead to incomplete or inaccurate records if not updated promptly.

LIMITATIONS



THANK YOU!

OPTIMIZATION

```
CREATE INDEX  
idx_crimes_location ON  
crimes(location);
```

```
CREATE INDEX  
idx_suspects_crime_id ON  
suspects(crime_id);
```

```
CREATE INDEX  
idx_crimes_status ON  
crimes(status);
```

```
CREATE INDEX  
idx_case_investigators_crime_id ON  
case_investigators(crime_id)
```

```
CREATE INDEX  
idx_victims_crime_id ON  
victims(crime_id);
```

```
CREATE INDEX  
idx_evidence_crime_id ON  
evidence(crime_id);
```