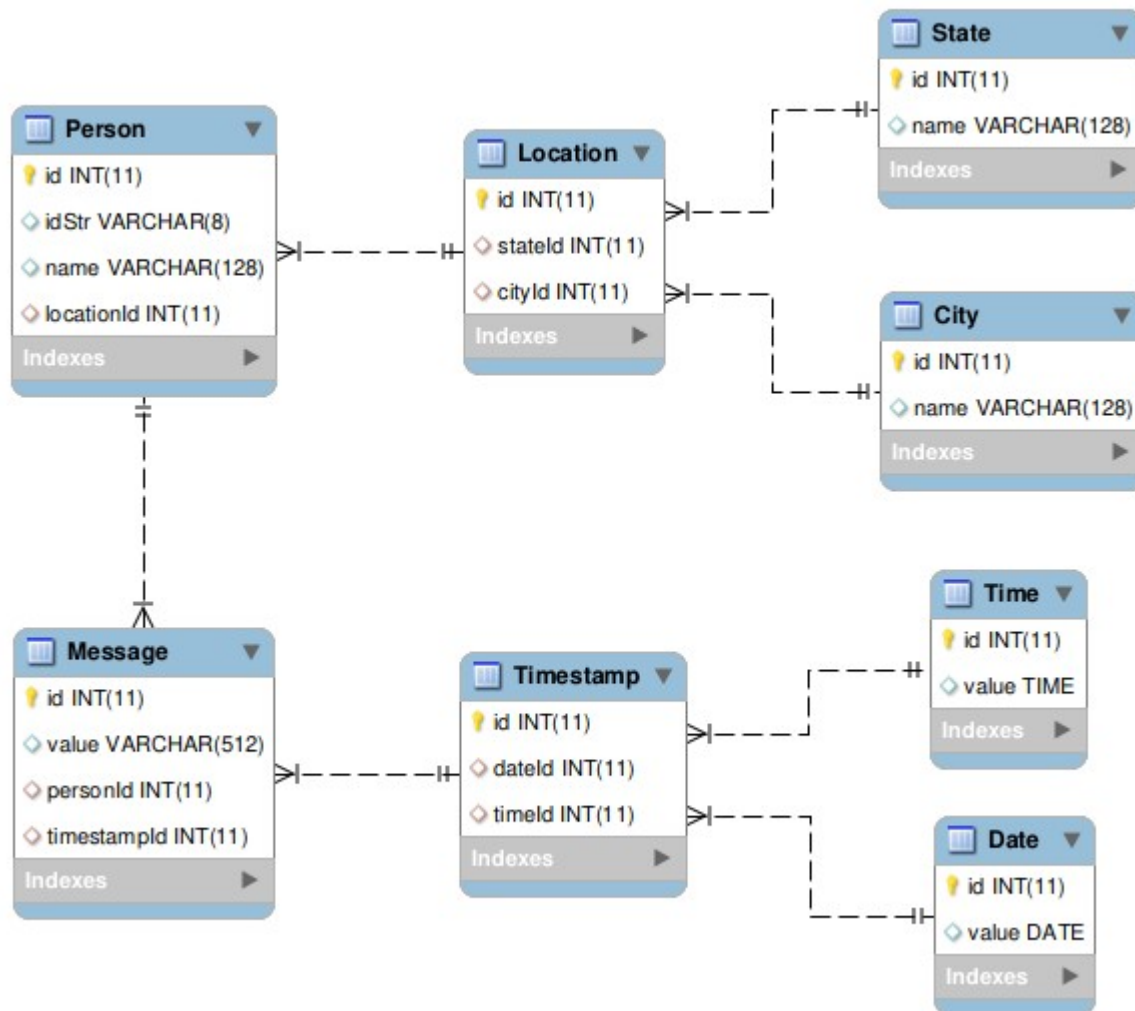


Stage 1 – Step b

1.

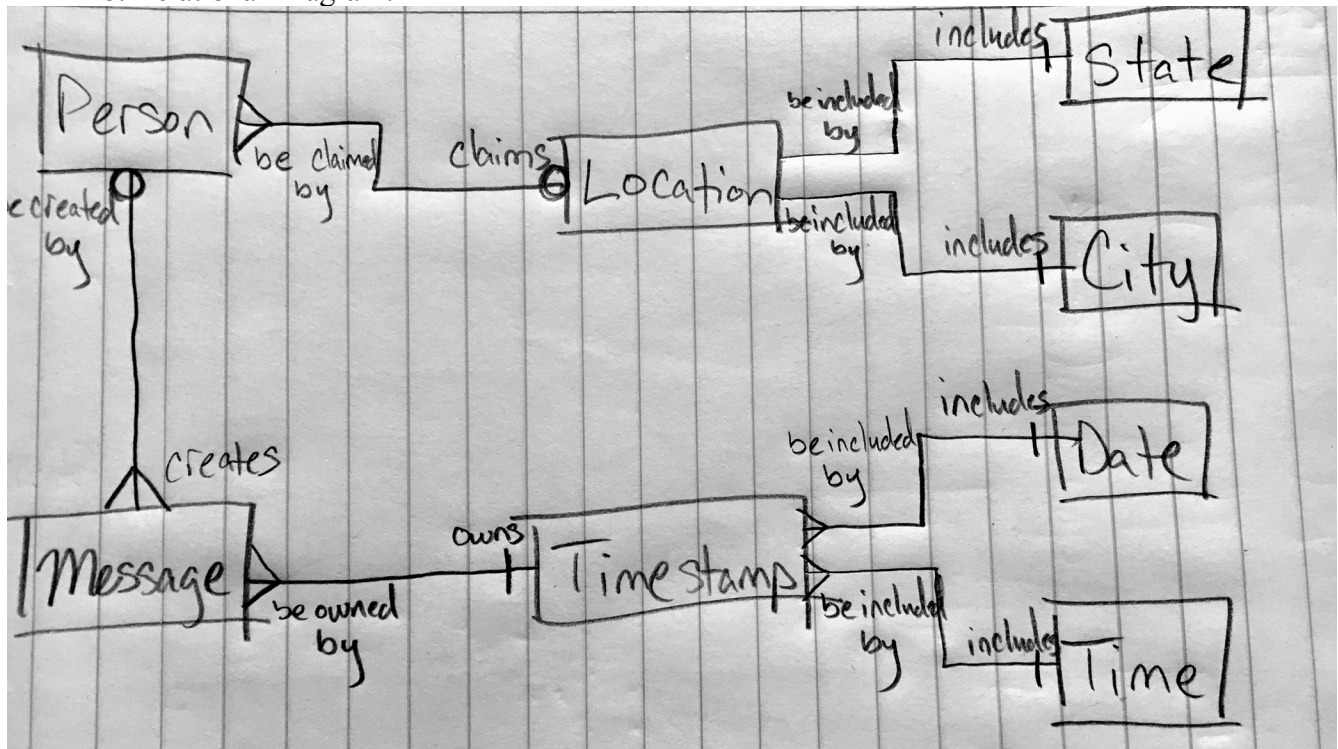
a. ER Diagram:



Reasons leading to the design:

The goal was to make good use of normalization in the design. The two major entities are Person and Message. The rest of the tables are simply supporting the attributes of those entities. The Location table is simply a sort of join table to handle the relationship between a Person and their Location. Many people can live in the same location, and many states have overlapping city names. The same relationship can be seen in the Timestamp table. Many dates may share the same time, so they can be reused by breaking them out into a different table and joining them together in the Timestamp table.

b. Relational Diagram:



Reasons leading to the design:

According to the patterns in the provided data, it seemed necessary to include a join table between (Person and State/City) and (Message and Date/Time) for fully normalization. For instance, multiple Messages could have the same Timestamp, and multiple messages could have a Timestamp with the same date, so the tables were structured this way. The same goes for Person – State/City. Regarding “optional” relationships, a Person did not need a Location, but if it had one, it had both a State and City. A Person also did not require any Messages. But if it had one, each message **requires** a Timestamp and Date/Time.