Extra points

**1.Order Preserving Encryption Technique:**

To protect numerical attributes in a database we use Order-preserving encryption which is basically a cryptographic technique, and which will also preserve the order of the values. It will allow to encrypt the data which will also maintain the relative order of original data.

OPE can be summarized as follows:

**Original Data:**

Let’s consider an example of student and their weight like 24 , 26 , 30.

**Encryption process:**

For each value of original data, we apply order preserving encryption. Each original value will be converted in to encrypted value and order will remains same that is the order of original value and encrypted value will remains same.

**Encrypted Values:**

Once the encryption is done, encrypted values will be similar to original value, but the actual encryption will hide the values to the others who are not having the decrypted key.

**2.Implentation For weight Attribute**

a. key Generation: Encryption to each value of weight is recommended and it will be created and it will be converted to encrypted forms so that it will maintains the order.

b.Encryption Process: We utilize the Electronic Codebook (ECB) mode in the AES encryption algorithm for each Weight value. In order to ensure a uniform encryption format, the Weight undergoes a conversion into a fixed-size byte representation. The result is an encrypted weight that preserves the original order of values.

c.Decryption Process: A decryption function is created to retrieve the original Weight values from their encrypted counterparts. This function takes the encrypted Weight and reverses the byte transformation to restore it to an integer. The decryption procedure maintains the integrity of the original sequence.

**3.System Architecture:**

A diagram of a group

Description automatically generated *Figure 1*

**4.Implementatition: -**

* Copy this repository to your computer.
* Install a SQL database system locally, such as MySQL.
* In this instance, we have two user groups (Group H and Group B) with various access permissions.
* created the database tables in accordance with the project specifications.
* We put access control and security elements into place, like hashing passwords and requiring user verification.
* Different user groups' access restriction (Group H and Group B).
* Data item integrity checks and protection for query integrity.
* Protection of sensitive attribute data confidentially
* To access the features specific to a given user group, register and log in as a user.
* Looked through the Group B and Group H pages to observe how the access control systems worked.