**2.7. CLASS DIAGRAM:**

**A diagram of a computer

AI-generated content may be incorrect.2.7.2. Database Relationship Diagram (DRD):**

**A screenshot of a computer screen

AI-generated content may be incorrect.**

**2.8. DATABASE DESIGN:**

**2.8.1. Enhanced entity-relationship Model (EER):**

**A computer screen shot of a computer

AI-generated content may be incorrect.**

**2.8.2. Physical Model:**

* **Location**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Column** | **Type** | **Null** | **Extra** | **Link to** |
| **id** | **bigint** | **No** | **auto\_increment** |  |
| name | varchar(100) | No |  |  |
| latitude | decimal(9,6) | No |  |  |
| longtitude | decimal(9,6) | No |  |  |
| timezone | varchar(50) | No |  |  |
| created\_at | datetime | No | default current\_timestamp |  |
| update\_at | datetime | No | default current\_timestamp on update current\_timestamp |  |

* **Sensor**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Column** | **Type** | **Null** | **Extra** | **Link to** |
| **id** | **bigint** | **No** | **auto\_increment** |  |
| serial\_number | varchar(100) | No | unique |  |
| location\_id | bigint | Yes |  | location.id |
| sensor\_type | varchar(50) | No |  |  |
| model | varchar(100) | Yes |  |  |
| installation\_date | date | Yes |  |  |
| status | enum | No | default active |  |
| created\_at | datetime | No | default current\_timestamp |  |
| updated\_at | datetime | No | default current\_timestamp on update current\_timestamp |  |

* **AirQualityData**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Column** | **Type** | **Null** | **Extra** | **Link to** |
| **id** | **bigint** | **No** | **auto\_increment** |  |
| location\_id | bigint | No |  | location.id |
| sensor\_id | bigint | No |  | sensor.id |
| timestamp\_utc | datetime | No |  |  |
| pm2.5 | float | Yes |  |  |
| pm10 | float | Yes |  |  |
| no2 | float | Yes |  |  |
| co | float | Yes |  |  |
| o3 | float | Yes |  |  |
| so2 | float | Yes |  |  |
| aqi | int | Yes |  |  |
| created\_at | datetime | No | default current\_timestamp |  |

* **WeatherData**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Column** | **Type** | **Null** | **Extra** | **Link to** |
| **id** | **bigint** | **No** | **auto\_increment** |  |
| location\_id | bigint | No |  | location.id |
| timestamp\_utc | datetime | No |  |  |
| temperature\_c | float | Yes |  |  |
| humidity\_pct | float | Yes |  |  |
| wind\_speed\_mps | float | Yes |  |  |
| wind\_dir\_deg | int | Yes |  |  |
| precip\_probability\_pct | float | Yes |  |  |
| pressure\_hpa | float | Yes |  |  |
| created\_at | datetime | No | default current\_timestamp |  |

* **Forecast**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Column** | **Type** | **Null** | **Extra** | **Link to** |
| **id** | **bigint** | **No** | **auto\_increment** |  |
| location\_id | bigint | No |  | location.id |
| forecast\_generated\_at | datetime | No |  |  |
| forecast\_at\_timestamp | datetime | No |  |  |
| pred\_pm25 | float | Yes |  |  |
| pred\_pm10 | float | Yes |  |  |
| pred\_no2 | float | Yes |  |  |
| pred\_co | float | Yes |  |  |
| pred\_o3 | float | Yes |  |  |
| pred\_so2 | float | Yes |  |  |
| model\_version | varchar(50) | Yes |  |  |
| created\_at | datetime | No | default current\_timestamp |  |

* **User**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Column** | **Type** | **Null** | **Extra** | **Link to** |
| **id** | **bigint** | **No** | **auto\_increment** |  |
| username | varchar(50) | No | unique |  |
| password\_hash | varchar(255) | No |  |  |
| full\_name | varchar(100) | Yes |  |  |
| email | varchar(100) | No | unique |  |
| phone | varchar(20) | Yes |  |  |
| role | enum | No | default ‘user’ |  |
| status | enum | No | default ‘active’ |  |
| created\_at | datetime | No | default current\_timestamp |  |
| updated\_at | datetime | No | default current\_timestamp on update current\_timestamp |  |
| last\_login\_at | datetime | Yes |  |  |

* **AlertThreshold**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Column** | **Type** | **Null** | **Extra** | **Link to** |
| **id** | **bigint** | **No** | **auto\_increment** |  |
| user\_id | bigint | No |  | user.id |
| pollutant | enum | No |  |  |
| threshold\_value | float | No |  |  |
| comparison | enum | No |  |  |
| created\_at | datetime | No | default current\_timestamp |  |
| updated\_at | datetime | No | default current\_timestamp on update current\_timestamp |  |

* **Alert**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Column** | **Type** | **Null** | **Extra** | **Link to** |
| **id** | **bigint** | **No** | **auto\_increment** |  |
| user\_id | bigint | No |  | user.id |
| threshold\_id | bigint | No |  | threshold.id |
| aq\_data\_id | bigint | No |  | aq\_data.id |
| triggered\_at | datetime | No |  |  |
| status | enum | No | default ‘sent’ |  |
| created\_at | datetime | No | default current\_timestamp |  |

* **Report**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Column** | **Type** | **Null** | **Extra** | **Link to** |
| **id** | **bigint** | **No** | **auto\_increment** |  |
| user\_id | bigint | No |  | user.id |
| location\_id | bigint | No |  | location.id |
| report\_type | enum | No |  |  |
| start\_timestamp | datetime | Yes |  |  |
| end\_timestamp | datetime | Yes |  |  |
| content | text | Yes |  |  |
| created\_at | datetime | No | default current\_timestamp |  |

* **SupportRequest**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Column** | **Type** | **Null** | **Extra** | **Link to** |
| **id** | **bigint** | **No** | **auto\_increment** |  |
| user\_id | bigint | No |  | user.id |
| subject | varchar(150) | Yes |  |  |
| message | text | No |  |  |
| status | enum | No | default ‘open’ |  |
| response | text | Yes |  |  |
| created\_at | datetime | No | default current\_timestamp |  |
| updated\_at | datetime | No | default current\_timestamp on update current\_timestamp |  |

* **PasswordReset**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Column** | **Type** | **Null** | **Extra** | **Link to** |
| **id** | **bigint** | **No** | **auto\_increment** |  |
| user\_id | bigint | No |  | user.id |
| token | varchar(100) | No | unique |  |
| created\_at | datetime | No | default current\_timestamp |  |
| expires\_at | datetime | No |  |  |
| used\_at | datetime | Yes |  |  |