**Database Implementation**

**Table structure and their description:**

**Primary Key** in **red**.

**Foreign Keys** in **green**.

**House Address**→ Every customer has a single mailing address in the system. And since each customer can have multiple accounts that same address (belonging to a single customer) can be associated with multiple accounts.

|  |  |  |  |
| --- | --- | --- | --- |
| **hid** | street | city | zip |

**Mailing Address** → This table stored the permanent/mailing address of all customers.

|  |  |  |  |
| --- | --- | --- | --- |
| **addr\_id** | street | city | zip |

**Customer** → This table would store information related to customer and his mailing address relation.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **cid** | **addr\_id** | cname | phone | email | password |

**Account** → A customer can have multiple accounts. Each account is linked to a single house address. And since every customer has only one mailing address in the system, that address can be associated with multiple accounts (belonging to the same customer). Every account can have a single status at any given time.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **aid** | **cid** | **hid** | status | account\_balance | start\_date | end\_date |

**Monthly Bill →** Stores monthly bills for each account.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **bid** | **aid** | rid | bill\_date | electricity\_usage | gas\_usage | previous\_balance | due\_date | total\_charge |

**Rate** → Stores the current unit charge for electricity ($ per kW) and gas ($ per cubic feet).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **rid** | electricity\_rate | gas\_rate | flat\_fee | rate\_date |

**Outage** → Stores information about a given power outage. Each instance of an outage can have only a single status at any given time. This table helps identify all the households that are impacted by a given outage.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **oid** | status | start\_time | end\_time | outage\_zip |

**Houses Affected →** It shows the list of houses affected by outage. Combination of oid and hid will form primary key.

|  |  |
| --- | --- |
| **oid** | **hid** |

**Service Problem** → Allows customers to report a service problem. A customer can report multiple service problems. A service problem can only be associated with a single status at any given time.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **tid** | **aid** | status | problem\_category | problem\_description | report\_date | resolve\_date | service\_charge |

**Message** → A message table for customer accounts. Each customer can send out multiple messages using his/her account.

|  |  |  |  |
| --- | --- | --- | --- |
| **mid** | **aid** | message\_body | message\_date |

**Payment History** → Stores the payment history of each customer for each account.

|  |  |  |  |
| --- | --- | --- | --- |
| **pid** | **aid** | payment\_amount | payment\_date |