**1. Users Table**

**Table Name**: users

| **Attribute** | **Type** | **Constraints** | **Description** |
| --- | --- | --- | --- |
| user\_id | BIGINT | PRIMARY KEY, AUTO\_INCREMENT | Unique identifier for each user. |
| first\_name | VARCHAR(50) | NOT NULL | User's first name. |
| last\_name | VARCHAR(50) | NOT NULL | User's last name. |
| email | VARCHAR(100) | UNIQUE, NOT NULL | User's email address. |
| phone\_number | VARCHAR(15) | UNIQUE, NOT NULL | User's phone number. |
| pan | VARCHAR(10) | NOT NULL, UNIQUE | User's Permanent Account Number. |
| username | VARCHAR(50) | UNIQUE, NOT NULL | User's username. |
| password\_hash | VARCHAR(255) | NOT NULL | Hashed password for authentication. |
| role | ENUM('Investor', 'Admin') | NOT NULL | User role in the system. |

**Primary Key**: user\_id

**2. Companies Table**

**Table Name**: companies

| **Attribute** | **Type** | **Constraints** | **Description** |
| --- | --- | --- | --- |
| company\_id | BIGINT | PRIMARY KEY, AUTO\_INCREMENT | Unique identifier for each company. |
| name | VARCHAR(100) | NOT NULL | Name of the company. |
| symbol | VARCHAR(10) | UNIQUE, NOT NULL | Stock ticker symbol. |
| description | TEXT | NULL | Brief description of the company. |

**Primary Key**: company\_id

**3. Stock Prices Table**

**Table Name**: stock\_prices

| **Attribute** | **Type** | **Constraints** | **Description** |
| --- | --- | --- | --- |
| price\_id | BIGINT | PRIMARY KEY, AUTO\_INCREMENT | Unique identifier for each price record. |
| company\_id | BIGINT | FOREIGN KEY (companies.company\_id) | Reference to the company. |
| date | DATE | NOT NULL | Date of the price record. |
| price | DECIMAL(10, 2) | NOT NULL | Closing price of the stock on the given date. |
| volume | BIGINT | NOT NULL | Number of shares traded. |

**Primary Key**: price\_id

**4. Orders Table**

**Table Name**: orders

| **Attribute** | **Type** | **Constraints** | **Description** |
| --- | --- | --- | --- |
| order\_id | BIGINT | PRIMARY KEY, AUTO\_INCREMENT | Unique identifier for each order. |
| user\_id | BIGINT | FOREIGN KEY (users.user\_id) | Reference to the user who placed the order. |
| company\_id | BIGINT | FOREIGN KEY (companies.company\_id) | Reference to the stock being traded. |
| order\_type | ENUM('Buy', 'Sell') | NOT NULL | Type of order: Buy or Sell. |
| quantity | INT | NOT NULL | Number of shares in the order. |
| price | DECIMAL(10, 2) | NOT NULL | Price per share at the time of the order. |
| status | ENUM('Pending', 'Executed', 'Cancelled') | NOT NULL | Status of the order. |
| created\_at | TIMESTAMP | DEFAULT CURRENT\_TIMESTAMP | Time when the order was created. |

**Primary Key**: order\_id

**5. Transactions Table**

**Table Name**: transactions

| **Attribute** | **Type** | **Constraints** | **Description** |
| --- | --- | --- | --- |
| transaction\_id | BIGINT | PRIMARY KEY, AUTO\_INCREMENT | Unique identifier for each transaction. |
| buy\_order\_id | BIGINT | FOREIGN KEY (orders.order\_id) | Reference to the buy order. |
| sell\_order\_id | BIGINT | FOREIGN KEY (orders.order\_id) | Reference to the sell order. |
| quantity | INT | NOT NULL | Number of shares traded in the transaction. |
| price | DECIMAL(10, 2) | NOT NULL | Price per share at the time of the transaction. |
| transaction\_date | DATE | NOT NULL | Date of the transaction. |

**Primary Key**: transaction\_id

**6. User Portfolio Table**

**Table Name**: user\_portfolio

| **Attribute** | **Type** | **Constraints** | **Description** |
| --- | --- | --- | --- |
| portfolio\_id | BIGINT | PRIMARY KEY, AUTO\_INCREMENT | Unique identifier for each portfolio record. |
| user\_id | BIGINT | FOREIGN KEY (users.user\_id) | Reference to the user. |
| company\_id | BIGINT | FOREIGN KEY (companies.company\_id) | Reference to the company. |
| quantity | INT | NOT NULL | Number of shares owned by the user. |
| average\_price | DECIMAL(10, 2) | NOT NULL | Average price per share purchased. |

**Primary Key**: portfolio\_id

**Relationships and Foreign Keys**

* **Users**: The central table containing user information.
* **Companies**: Contains information about companies/stocks.
* **Stock Prices**: Historical prices and volumes of stocks, linked to companies.
* **Orders**: Contains buy/sell orders placed by users, linked to users and companies.
* **Transactions**: Logs executed transactions based on matching orders, linked to orders.
* **User Portfolio**: Tracks the quantity and average price of stocks owned by each user, linked to users and companies.