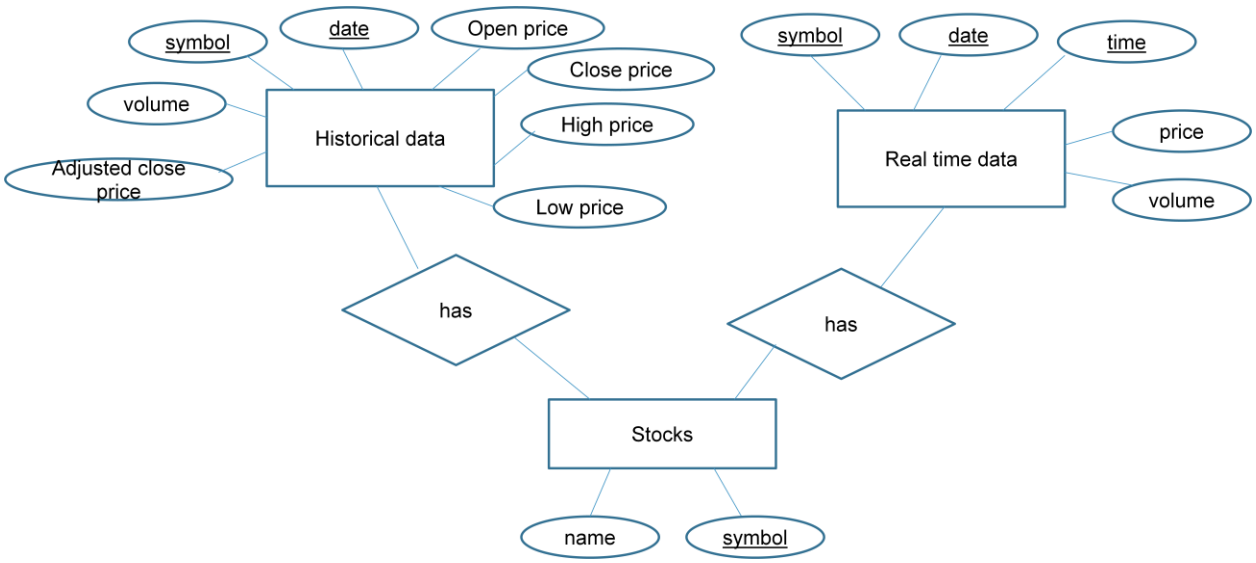
Database schema:

This document contains the ER diagram, postgresql script, schemas and relations related to the database design of phase 1

ER Diagram:



Database script:

 # The following script creates all the schemas and relations required for the project #phase 1

```
drop database if exists postgres;

create database postgres;

\connect postgres


CREATE TABLE stocks(
   symbol varchar(10) PRIMARY KEY NOT NULL,
   name varchar(30) NOT NULL
);

insert into stocks
values('GOOG','Google'),('YHOO','Yahoo'),('INTC','Intel'),('AAPL','Apple'),('TSLA','Tesla');

CREATE TABLE real_time_data(
   symbol varchar(10) references stocks(symbol),
   date date,
   time time,
   price NUMERIC(10, 2),
   volume integer,
   adj_close_price NUMERIC(10,2),
   PRIMARY KEY (symbol, date, time)
);

CREATE TABLE historical_data(
   symbol varchar(10) references stocks(symbol),
   date date,
   open_price NUMERIC(10, 2),
   close_price NUMERIC(10, 2),
   high_price NUMERIC(10, 2),
   low_price NUMERIC(10, 2),
   volume integer,
   adj_close_price NUMERIC(10,2),
   PRIMARY KEY (symbol, date)
);
```

Relations and their schema:

There are three relations in the current database design for phase 1:

All the relations are created by executing the above script.

1. The basic relation required is named as **'stocks'** and it looks as shown below:

Schema of stocks:

```
postgres=# \d+ stocks
                          Table "public.stocks"
 Column |         Type          | Modifiers | Storage  | Stats target | Description
--------+-----------------------+-----------+----------+--------------+-------------
 symbol | character varying(10) | not null  | extended |              |
 name   | character varying(30) | not null  | extended |              |
Indexes:
    "stocks_pkey" PRIMARY KEY, btree (symbol)
Referenced by:
    TABLE "historical_data" CONSTRAINT "historical_data_symbol_fkey" FOREIGN KEY (symbol) REFERENCES stocks(symbol)
    TABLE "real_time_data" CONSTRAINT "real_time_data_symbol_fkey" FOREIGN KEY (symbol) REFERENCES stocks(symbol)
```

stocks Relation with entries:

```
postgres=# select * from stocks;
 symbol |  name
--------+--------
 GOOG   | Google
 YHOO   | Yahoo
 INTC   | Intel
 AAPL   | Apple
 TSLA   | Tesla
(5 rows)
```

2. To save the historic data of all the stocks **'historical_data'** relation is created.

Schema of historical_data:

```
postgres=# \d+ historical_data
                          Table "public.historical_data"
     Column      |         Type          | Modifiers | Storage  | Stats target | Description
-----------------+-----------------------+-----------+----------+--------------+-------------
 symbol          | character varying(10) | not null  | extended |              |
 date            | date                  | not null  | plain    |              |
 open_price      | numeric(10,2)         |           | main     |              |
 close_price     | numeric(10,2)         |           | main     |              |
 high_price      | numeric(10,2)         |           | main     |              |
 low_price       | numeric(10,2)         |           | main     |              |
 volume          | integer               |           | plain    |              |
 adj_close_price | numeric(10,2)         |           | main     |              |
Indexes:
    "historical_data_pkey" PRIMARY KEY, btree (symbol, date)
Foreign-key constraints:
    "historical_data_symbol_fkey" FOREIGN KEY (symbol) REFERENCES stocks(symbol)
```

historical_data with entries:

A sample collection of records from the historical_data relation looks as below:

symbol	date	open_price	close_price	high_price	low_price	volume	adj_close_price
GOOG	2015-03-06	575.02	575.33	577.91	573.41	1375800	575.33
GOOG	2015-03-05	571.87	573.37	577.11	568.01	1713800	573.37
GOOG	2015-03-04	570.45	573.64	575.39	566.52	1694300	573.64
GOOG	2015-03-03	560.53	571.34	572.15	558.75	2118400	571.34
GOOG	2015-02-28	554.24	558.40	564.71	552.90	2344200	558.40
GOOG	2015-02-27	543.21	555.48	556.14	541.50	2305200	555.48
GOOG	2015-02-26	535.90	543.87	546.22	535.45	1821000	543.87
GOOG	2015-02-25	530.00	536.09	536.79	528.25	1002300	536.09
GOOG	2015-02-24	536.05	531.91	536.44	529.41	1453900	531.91

3. To save the historic data of all the stocks **‘realtime_data’** relation is created.

```
postgres=# \d+ real_time_data
                            Table "public.real_time_data"
     Column      |          Type          | Modifiers | Storage  | Stats target | Description
-----------------+------------------------+-----------+----------+--------------+-------------
 symbol          | character varying(10)  | not null  | extended |              |
 date            | date                   | not null  | plain    |              |
 time            | time without time zone | not null  | plain    |              |
 price           | numeric(10,2)          |           | main     |              |
 volume          | integer                |           | plain    |              |
 adj_close_price | numeric(10,2)          |           | main     |              |
Indexes:
    "real_time_data_pkey" PRIMARY KEY, btree (symbol, date, "time")
Foreign-key constraints:
    "real_time_data_symbol_fkey" FOREIGN KEY (symbol) REFERENCES stocks(symbol)
```

Schema of realtime_data:

realtime_data with entries:

```
postgres=# select * from real_time_data ;
 symbol |    date    |   time   | price  |  volume  | adj_close_price
--------+------------+----------+--------+----------+-----------------
 GOOG   | 2015-03-05 | 03:37:21 | 573.37 |  1871694 |
 YHOO   | 2015-03-05 | 03:37:21 |  43.99 | 30098498 |
 INTC   | 2015-03-05 | 03:37:21 |  34.12 | 23005798 |
 AAPL   | 2015-03-05 | 03:37:21 | 128.54 | 31666340 |
 TSLA   | 2015-03-05 | 03:37:21 | 202.44 |  4221962 |
 GOOG   | 2015-03-05 | 03:37:30 | 573.37 |  1871694 |
 YHOO   | 2015-03-05 | 03:37:30 |  43.99 | 30098498 |
 INTC   | 2015-03-05 | 03:37:30 |  34.12 | 23005798 |
 AAPL   | 2015-03-05 | 03:37:30 | 128.54 | 31666340 |
 TSLA   | 2015-03-05 | 03:37:30 | 202.44 |  4221962 |
 GOOG   | 2015-03-05 | 03:37:41 | 573.37 |  1871694 |
 YHOO   | 2015-03-05 | 03:37:41 |  43.99 | 30098498 |
 INTC   | 2015-03-05 | 03:37:41 |  34.12 | 23005798 |
 AAPL   | 2015-03-05 | 03:37:41 | 128.54 | 31666340 |
 TSLA   | 2015-03-05 | 03:37:41 | 202.44 |  4221962 |
```

A sample collection of records from the realtime_data relation looks as above.