An Industry Oriented Mini Project Presentation

On

Handling Optimizations using View formats on Hive Data Warehouse

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OVERVIEW

- Abstract
- Introduction
- Literature Survey
- Existing System
- Proposed System
- Module Description
- Design
- Implementation & Testing
- Results
- Conclusion
- Future Enhancement
- Thank you

ABSTRACT

- To enhance Hive data warehouse performance for real-time stock data analysis.
- Implementation of specialized views based on profit categories:

  -View 1: Targets customers with significant profits for investment plans.

  - View 2: Focuses on customers with minimal profits, guiding stock suggestions.
- Avoiding table duplication by using views, ensuring real-time updates.
- Emphasizing query optimization and rigorous performance testing for low-latency analysis.

INTRODUCTION

- Stock consultancy relies on effective data use.
- Abundant customer data holds stock insights.
- Hive aids in creating distinct views of profit and loss perspectives.
- These views serve as specialized lenses, providing a granular and comprehensive analysis of stock performances.
- Leveraging Hive's robustness for data warehousing.
- Crafting specialized analytical lenses with Hive.
- Enhancing stock consultancy insights via Hive's capabilities.
- Employing Hive to extract nuanced stock transaction details.

LITERATURE SURVEY

Title : Data Processing in Hive vs. SQL Server: A comparative analysis in the query performance
Author: Nadeem Ahmed; Shakil Ahamed; Jahir Ibna Rafiq; Sifatur Rahim

Description:

- Relational Database Management Systems (RDBMS) like MySQL, SQL Server, Oracle, and SQLite play a crucial role in data processing.
- Big data technology is popular for handling extremely large datasets in large organizations.
- Comparison study between traditional databases (SQLite, SQL Server) and Hive on Hadoop for Small Enterprises (SE).
- Suggests using traditional databases if the dataset fits on a single computer and there's no plan for handling vast amounts of data soon.

EXISTING SYSTEM

Existing System Overview:

- Data Sources :Utilizes MySQL databases and flat files for managing customer stock transaction data.
- Tooling: Relies on Excel for data manipulation and Tableau for visualization purposes.

Drawbacks of the Existing System:

- Data Fragmentation
- Query Response Times
- Scalability Issues

PROPOSED SYSTEM

Objective of the Proposed System:

- Centralized Data Handling :Leverage Hive's distributed data warehouse to centralize and optimize storage for diverse customer stock transaction data.
- Efficient Analysis: Utilize structured querying within Hive for streamlined and efficient analysis of stock transactions.

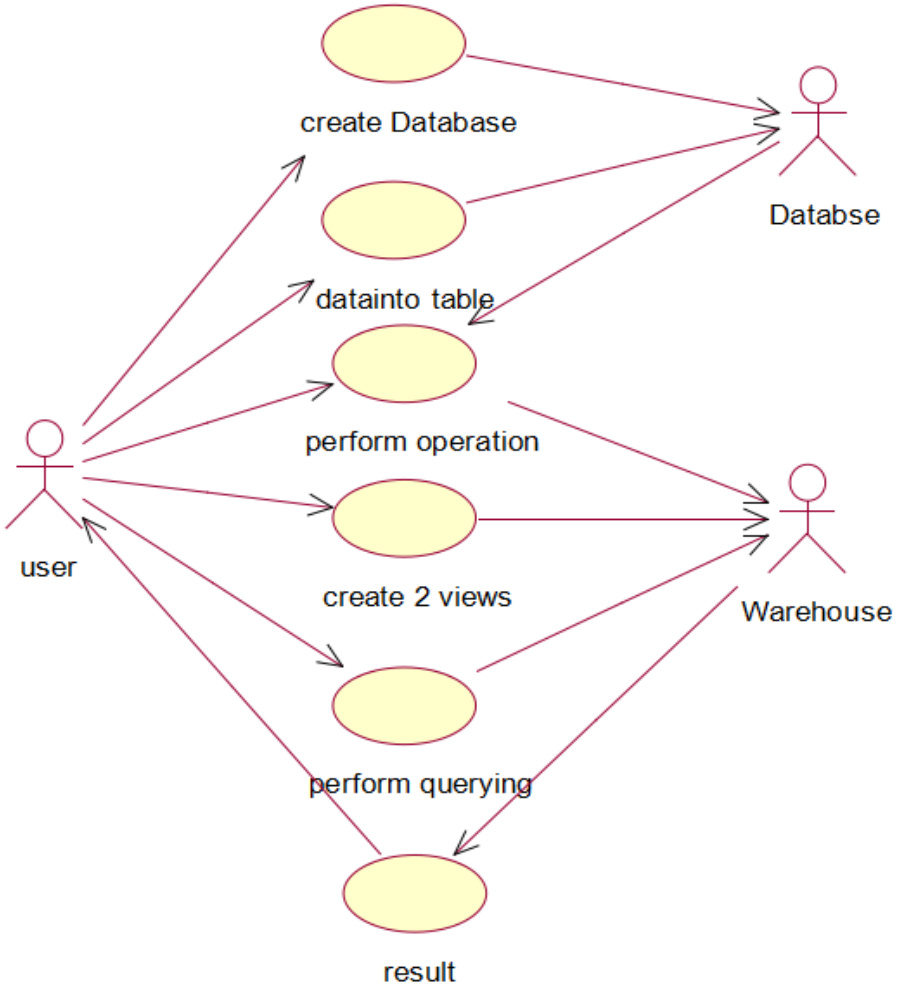
Advantages of the Proposed System:

- Centralized Data Storage
- Scalability
- Enhanced Query Performance

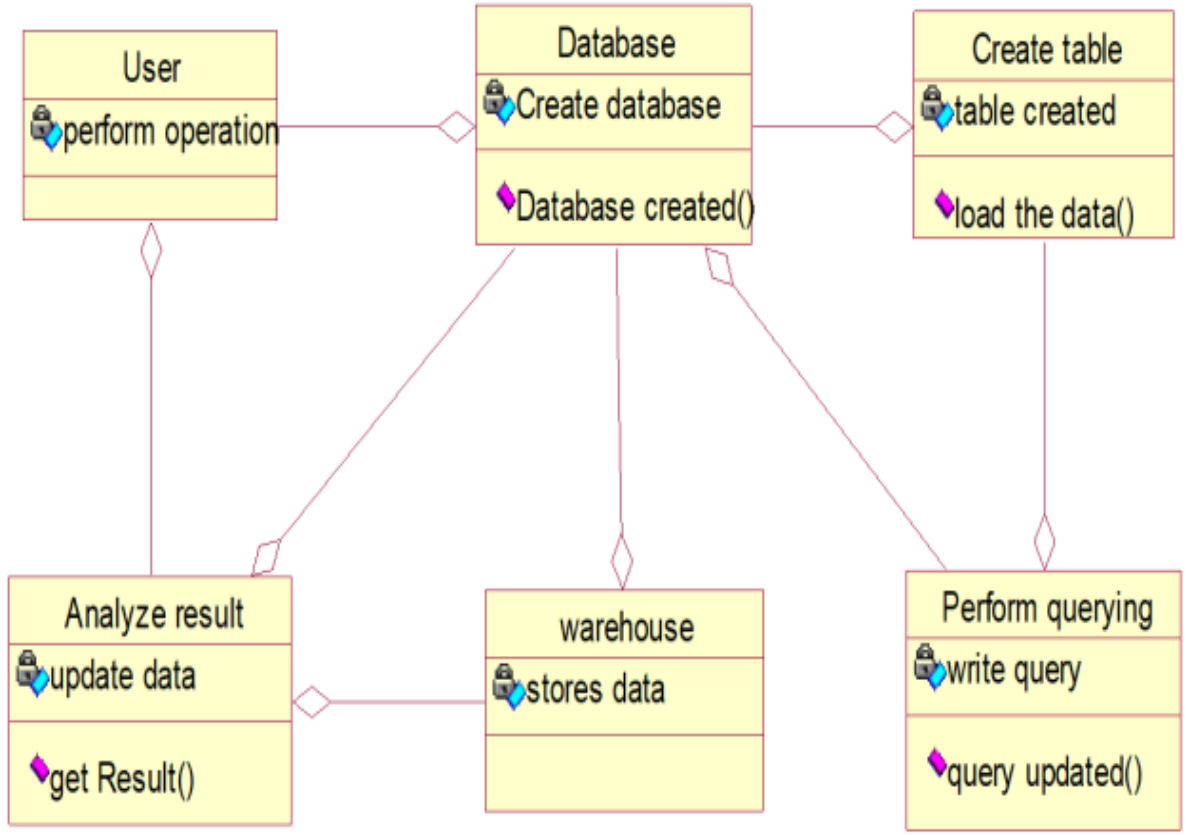
MODULE DESCRIPTION

- Data Ingestion
- Query Processing
- Custom View Creation
- Scalability and Performance
- Visualization and Reporting

DESIGN

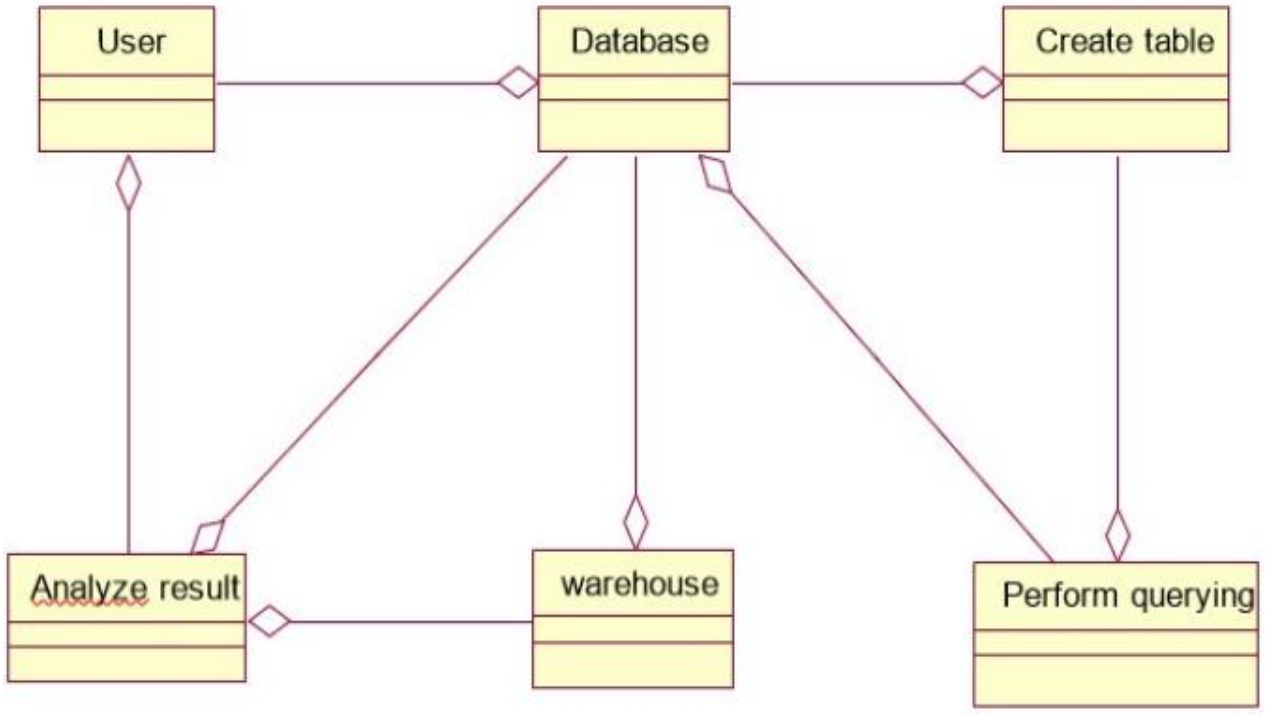


USE-CASE DIAGRAM

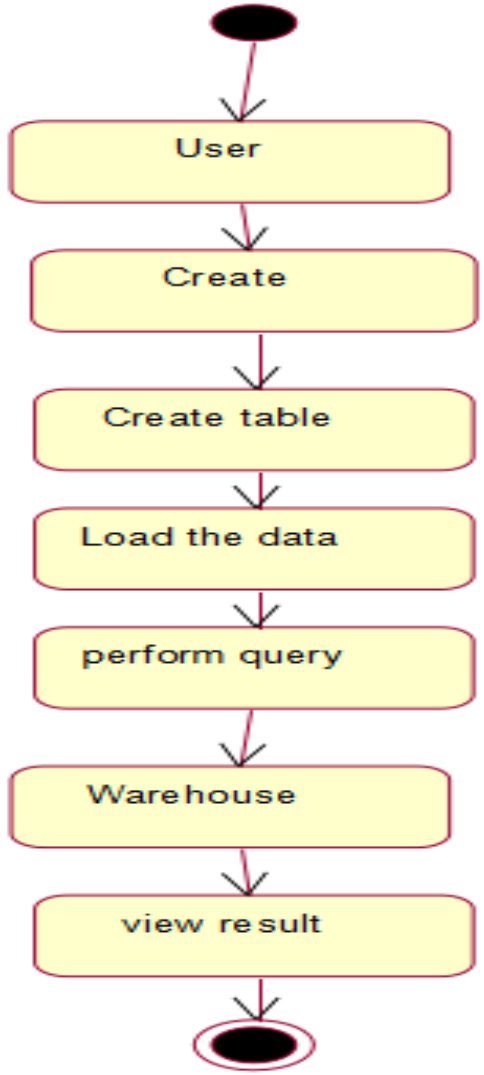


CLASS DIAGRAM

DESIGN

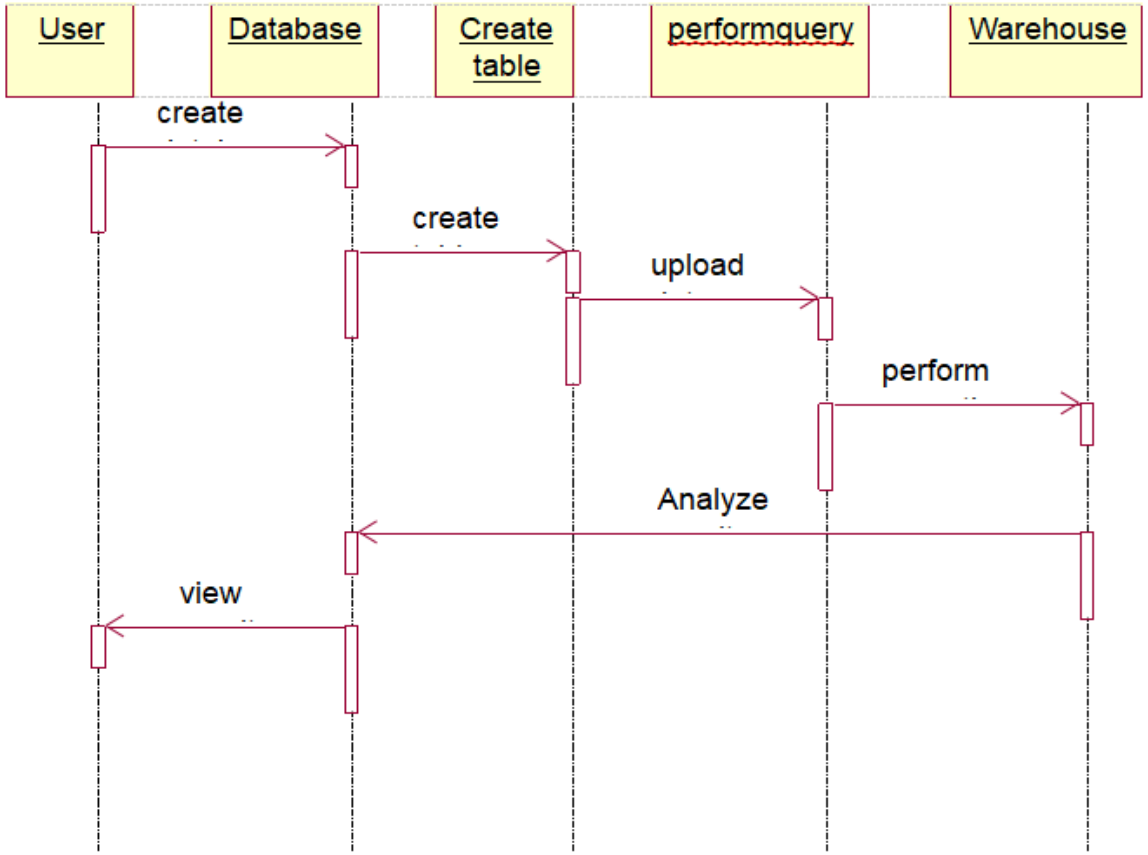


OBJECT DIAGRAM

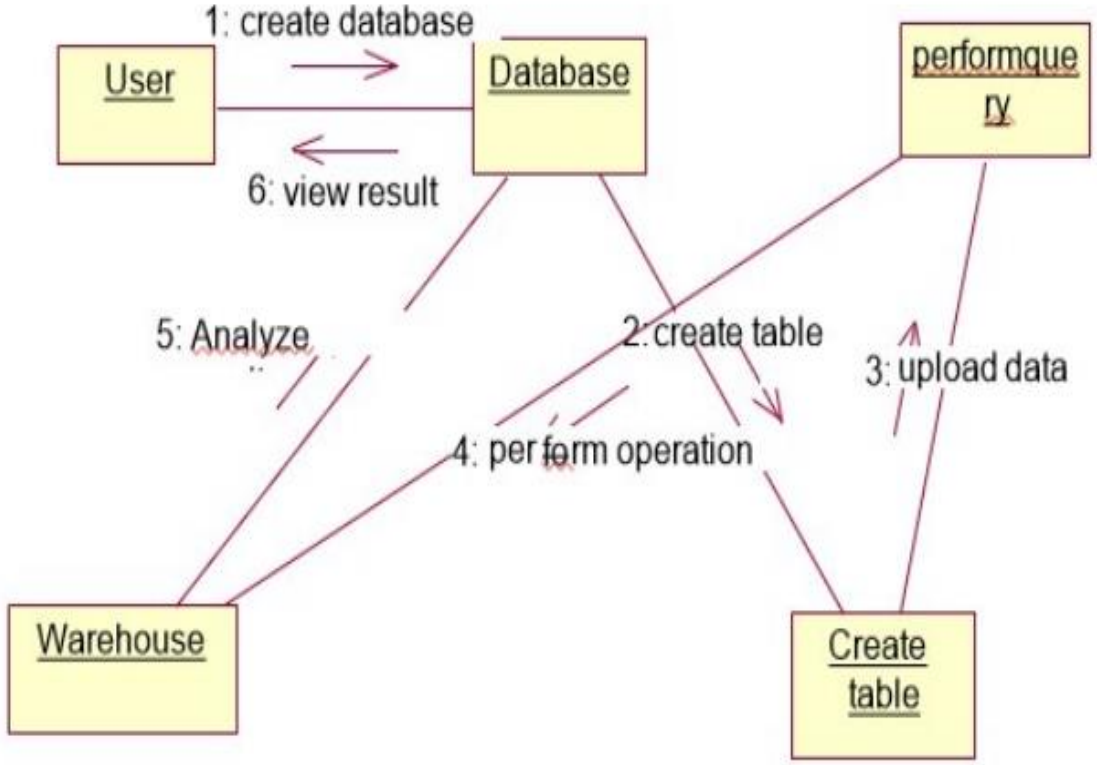


STATE-CHART DIAGRAM

DESIGN

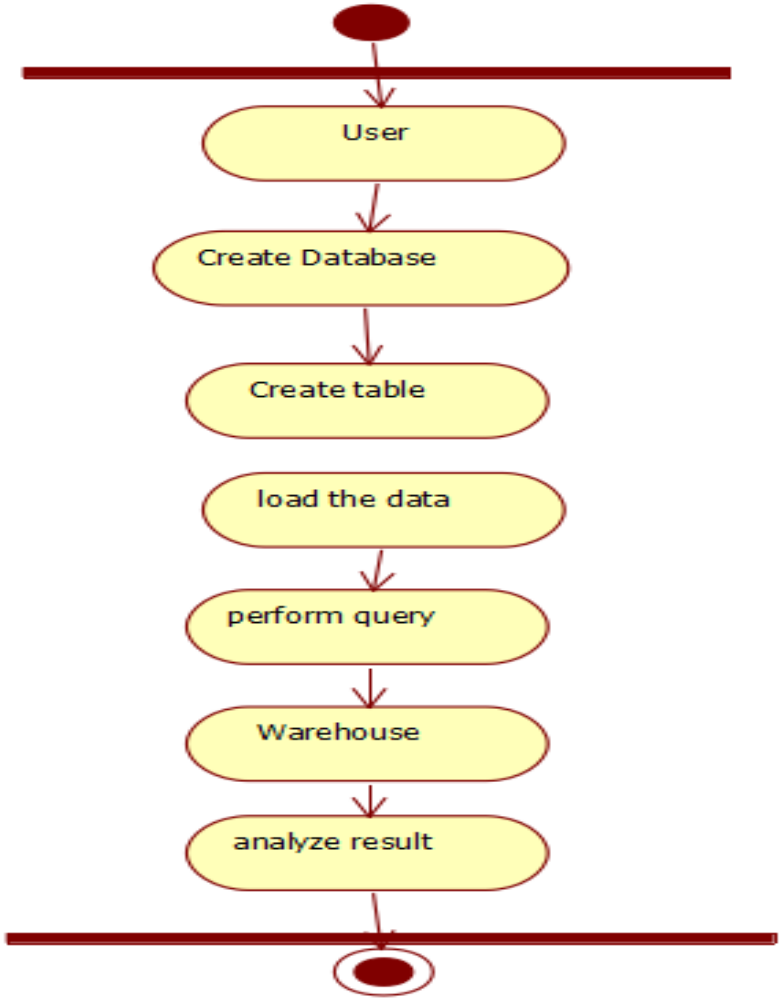


SEQUENCE DIAGRAM

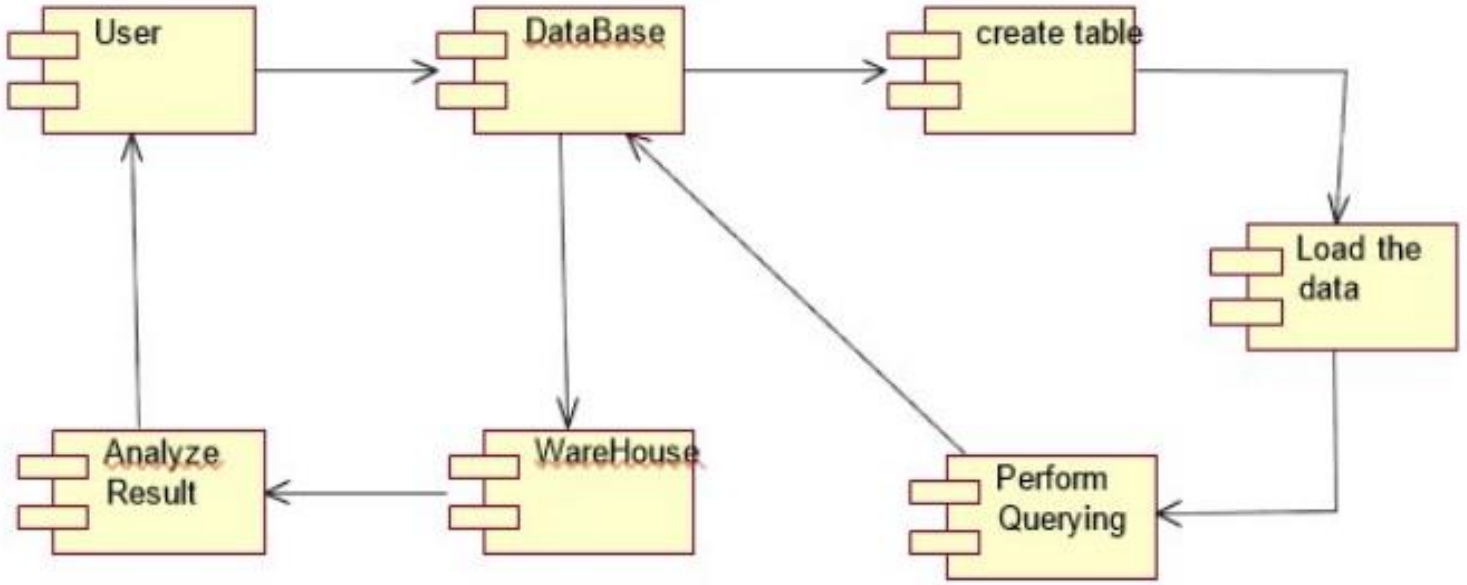


COLLABORATION DIAGRAM

DESIGN

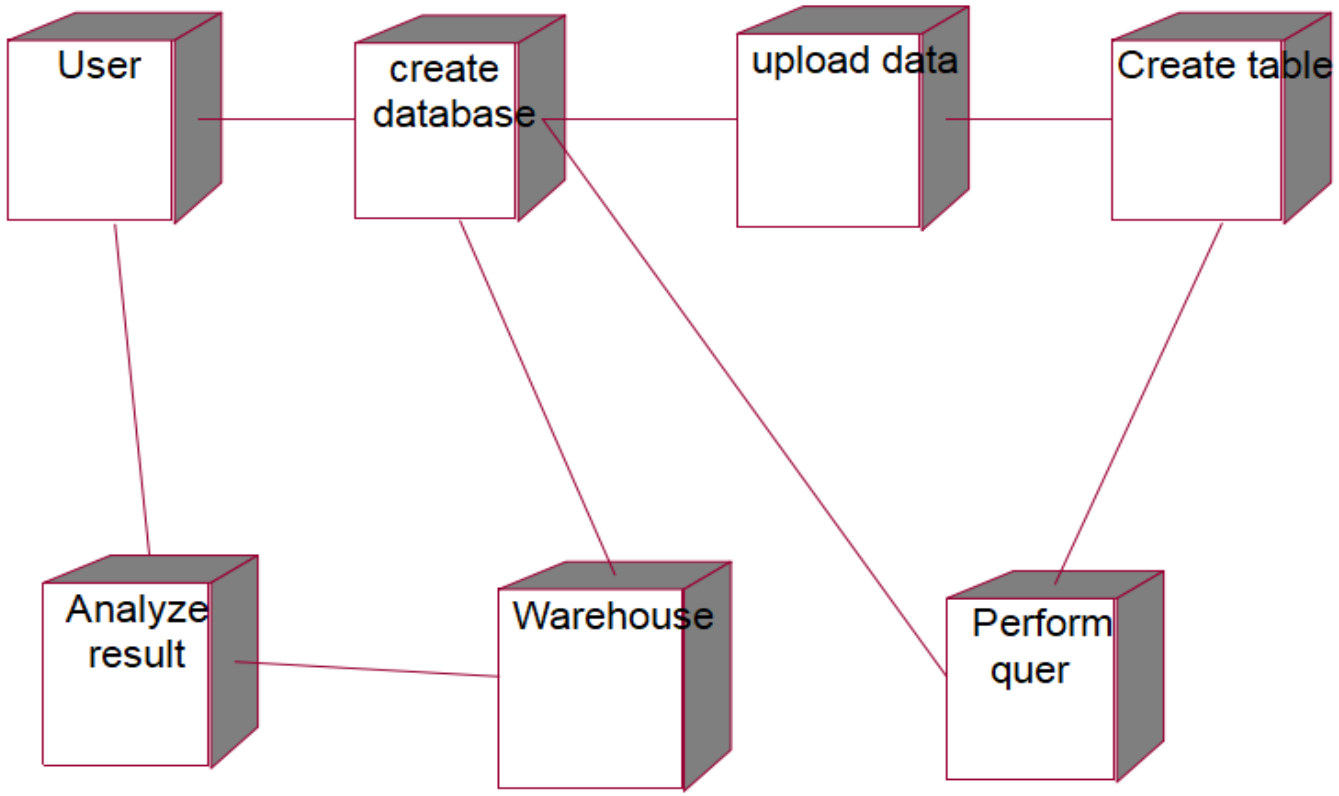


ACTIVITY DIAGRAM



COMPONENT DIAGRAM

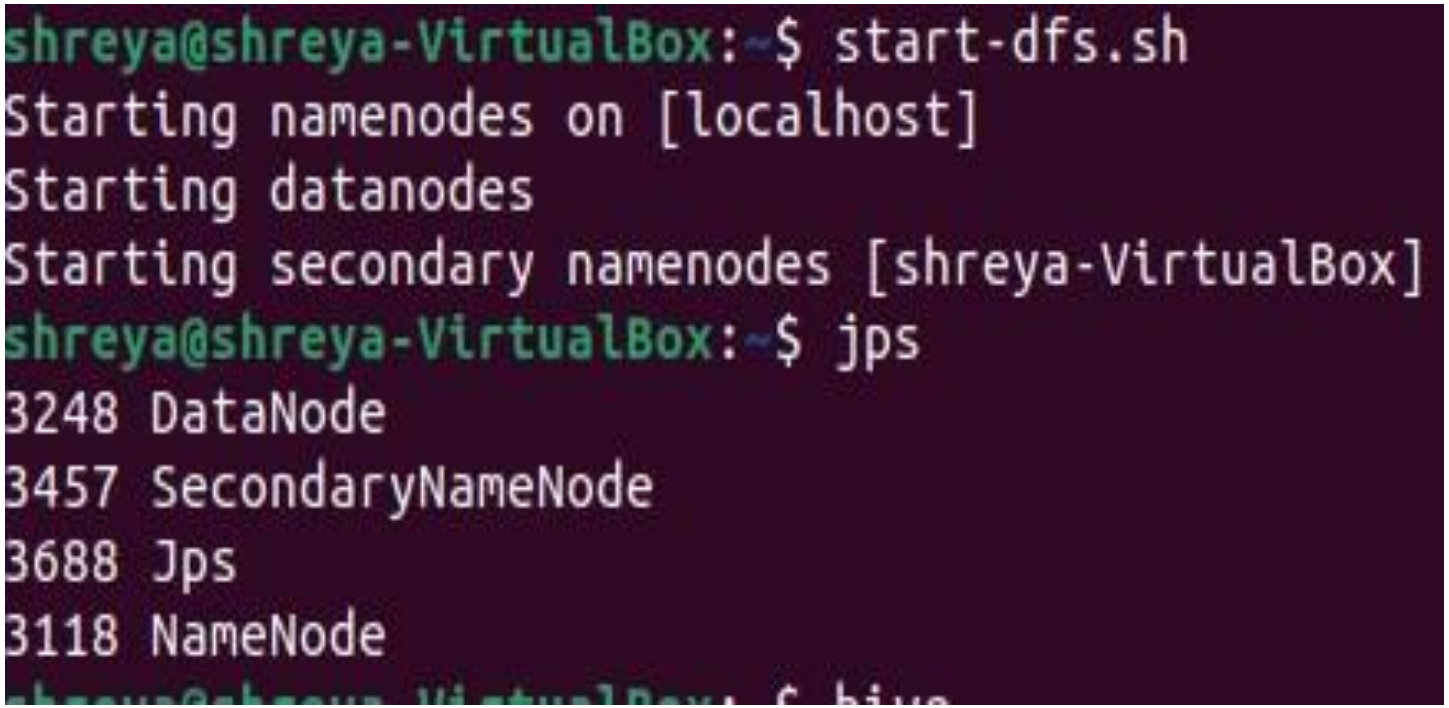
DESIGN



DEPLOYMENT DIAGRAM

IMPLEMENTATION& TESTING

1. Starting Hadoop environment to initialize hive



IMPLEMENTATION& TESTING

2. Starting Hive and creating database

```
shreya@shreya-VirtualBox:~$ hive
SLF4J: Class path contains multiple SLF4J bindings.
SLF4J: Found binding in [jar:file:/home/shreya/hive/lib/log4j-slf4j-impl-2.17.1.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: Found binding in [jar:file:/home/shreya/hadoop/share/hadoop/common/lib/slf4j-reload4j-1.7.35.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: See http://www.slf4j.org/codes.html#multiple_bindings for an explanation.
SLF4J: Actual binding is of type [org.apache.logging.slf4j.Log4jLoggerFactory]
Hive Session ID = 8393de39-af6b-4863-9090-d7b80b0c99d3

Logging initialized using configuration in jar:file:/home/shreya/hive/lib/hive-common-3.1.3.jar!/hive-log4j2.properties Async: true
Hive-on-MR is deprecated in Hive 2 and may not be available in the future versions. Consider using a different execution engine (i.e. spark, tez) or using Hive 1.X releases.
Hive Session ID = 532ae79b-03f0-4bd0-8f6e-edbc43a3c695
hive> show databases;
OK
batch11
batch_11
default
Time taken: 0.779 seconds, Fetched: 3 row(s)
hive> create database batch__11;
OK
Time taken: 0.26 seconds
hive> use batch__11;
OK
Time taken: 0.067 seconds
hive>
```

IMPLEMENTATION& TESTING

3. Creating table in database created and loading data

```
hive> create table stocks(stockid int,first_name string,last_name string,stock_name string,location string,purchase_value int, current_value int,current_dt date,trade int,good_to_sale boolean) row format
delimited fields terminated by ',' lines terminated by '\n' stored as textfile;
OK
Time taken: 0.865 seconds
hive> load data local inpath "/home/shreya/Downloads/stock.unknown" into table stocks;
Loading data to table batch_11.stocks
OK
Time taken: 1.381 seconds
hive> desc stocks;
OK
stockid                 int
first_name              string
last_name               string
stock_name              string
location                string
purchase_value          int
current_value           int
current_dt              date
trade                   int
good_to_sale            boolean
Time taken: 0.126 seconds, Fetched: 10 row(s)
hive>
```

IMPLEMENTATION& TESTING

4. Creating views on the basis of stocks table, for detailed analysis

```
hive> create view good_to_sale as select * from stocks where good_to_sale=true;
OK
Time taken: 0.403 seconds
hive> create view not_good_to_sale as select * from stocks where good_to_sale=false;
OK
Time taken: 1.041 seconds
hive> show views;
OK
good_to_sale
not_good_to_sale
stock_view
Time taken: 0.104 seconds, Fetched: 3 row(s)
hive>
```

IMPLEMENTATION& TESTING

```
hive> select * from good_to_sale;
OK
101     Jonas   Jules   AAPL    Delhi   1500    1800    2023-01-10      1       true
102     John    Smith   MSFT    Mumbai  2000    2200    2023-01-10      1       true
104     Sarah   Davis   TSLA    Hyderabad       2500    3000    2023-05-10      1       true
105     jonas   jules   AAPL    Chennai 1500    1800    2023-01-10      1       true
107     shawn   mendes  CAPGEM  Delhi   3500    1500    2023-03-10      1       true
109     james   smith   AAPL    Delhi   1500    1800    2023-03-10      0       true
111     ronald  clark   TCS     Hyderabad       1500    1800    2023-01-10      1       true
114     michelle        johnson APPL    Delhi   1400    1800    2023-01-11      1       true
116     daniel  clark   AAPL    Mumbai  4500    2800    2023-02-10      1       true
118     nancy   jules   TSLA    Hyderabad       1500    1800    2023-01-10      1       true
119     laura   williams        AAPL    Chennai 1300    1800    2023-01-11      1       true
121     sarah   lee     MSFT    Delhi   1400    1800    2023-02-10      1       true
122     jonas   smith   AAPL    Mumbai  2000    1800    2023-01-10      1       true
124     kevin   hill    AAPL    Chennai 2000    1800    2023-01-10      1       true
126     karen   robert  AAPL    Pune    2000    2800    2023-02-10      1       true
127     linda   jones   MSFT    Chennai 1500    1800    2023-01-10      1       true
128     sarah   jules   AAPL    Delhi   1500    1800    2023-01-10      1       true
131     michael scott   MSFT    Chennai 6500    3800    2023-02-10      1       true
133     white   scott   TCS     Delhi   2000    1800    2023-01-10      1       true
134     anthos  jules   AAPL    Mumbai  3000    3500    2023-01-10      1       true
137     helen   adams   AAPL    Delhi   1500    1800    2023-01-10      1       true
139     george  jules   AAPL    Bangalore       1500    2000    2023-03-10      1       true
142     sandra  davis   AAPL    Delhi   2000    1800    2023-01-10      1       true
144     elsa    gilbert AAPL    Bangalore       2500    1800    2023-01-10      1       true
147     jonas   allen   TCS     Delhi   2500    3800    2023-02-11      1       true
148     sandra  parker  AAPL    Mumbai  2000    1800    2023-01-11      1       true
150     donna   young   TSLA    Hyderabad       2500    3200    2023-02-10      1       true
152     charles gonzalez        AAPL    Delhi   2500    3800    2023-02-11      1       true
154     edward  nelson  AAPL    Bangalore       2000    1800    2023-01-12      1       true
155     carol   jules   AAPL    Hyderabad       1500    1800    2023-01-10      1       true
156     jonas   jules   AAPL    Pune    1500    1800    2023-01-10      1       true
158     ruth    taylor  AAPL    Mumbai  1500    1800    2023-01-10      1       true
159     susan   moore   TCS     Bangalore       2500    2800    2023-01-12      1       true
160     marget  jules   AAPL    Hyderabad       1500    1800    2023-01-10      1       true
163     brian   jules   TCS     Hyderabad       2000    3000    2023-01-12      1       true
164     dorthy  carter  MSFT    Chennai 2000    3500    2023-01-10      1       true
166     jules   chen    AAPL    Mumbai  2000    3000    2023-01-11      1       true
169     sharon  jules   AAPL    Pune    1500    1800    2023-01-10      1       true
171     jenna   stenn   ACCEN   Bangalore       1500    1800    2023-01-10      1       true
173     jonas   jenny   ACCEN   Pune    1500    1800    2023-01-10      1       true
174     stefan  salvatore       AAPL    Delhi   6000    5000    2023-01-10      1       true
180     bonnie  bennete AAPL    Mumbai  1500    1800    2023-01-10      1       true
181     damon   salvtoer        MSFT    Bangalore       1500    1800    2023-01-10      1       true
182     jonas   jules   ACCEN   Hyderabad       2500    1800    2023-01-10      1       true
```

View showcasing profitable stocks data

```
hive> select * from not_good_to_sale;
OK
103     Micheal Williams        GOOGL   Bangalore       3000    2800    2023-02-10      0       false
106     wick    john    ACCEN   Pune    3000    2000    2023-02-07      0       false
108     justin  bieber  TCS     Mumbai  4000    2000    2023-01-08      0       false
110     christ  anderson        GOOGL   Bangalore       4000    2300    2023-01-11      0       false
112     mary    wright  MSFT    Chennai 4500    3000    2023-01-10      0       false
113     lisa    mitchell        TSLA    Pune    2500    1800    2023-03-10      0       false
117     jonas   smith   MSFT    Bangalore       1500    1800    2023-01-10      0       false
120     mark    jules   AAPL    Pune    3500    2800    2023-08-10      0       false
123     robert  jules   CAPGEM  Hyderabad       2000    1800    2023-02-01      0       false
129     jonas   jules   AAPL    Mumbai  1500    1800    2023-01-11      0       false
130     jason   hill    AAPL    Hyderabad       1500    1300    2023-01-10      0       false
132     laura   jules   ACCEN   Pune    5000    3000    2023-02-10      0       false
135     donald  davis   AAPL    Hyderabad       2000    2500    2023-02-11      0       false
136     betty   walker  CAPGEM  Pune    2000    1300    2023-02-11      0       false
138     jeff    marlin  TSLA    Mumbai  1500    1800    2023-01-10      0       false
140     smith   john    AAPL    Hyderabad       2000    2500    2023-01-12      0       false
141     jenny   allen   ACCEN   Pune    1000    1800    2023-01-11      0       false
143     jonas   baker   MSFT    Mumbai  3000    2800    2023-01-11      0       false
145     jonathan        smith   ACCEN   Hyderabad       2000    1800    2023-01-11      0       false
146     richard parker  AAPL    Pune    2500    3000    2023-03-10      0       false
149     maria   jules   AAPL    Bangalore       2000    1800    2023-01-10      0       false
151     jones   denn    AAPL    Pune    1000    2000    2023-01-13      0       false
153     richie  moore   MSFT    Mumbai  2500    2000    2023-01-10      0       false
157     brian   king    TCS     Delhi   1570    1800    2023-01-11      0       false
161     ava     volkov  AAPL    Pune    2000    1800    2023-02-10      0       false
162     bridget larsen  AAPL    Delhi   2000    3000    2023-02-11      0       false
165     stella  alonso  AAPL    Delhi   1800    2800    2023-01-10      0       false
167     thomas  robin   AAPL    Bangalore       1500    1800    2023-01-10      0       false
168     ruth    taylor  evans   Mumbai  3000    2000    2023-02-11      0       false
170     collen  hover   MSFT    Delhi   2500    2800    2023-02-11      0       false
172     marie   jules   AAPL    Hyderabad       2000    3000    2023-02-10      0       false
175     jenn    gilbert AAPL    Mumbai  2000    2500    2023-02-10      0       false
176     sandra  jules   MSFT    Chennai 2000    1800    2023-02-11      0       false
177     sentil  joone   AAPL    Hyderabad       2000    3000    2023-01-10      0       false
178     jenny   harry   ACCEN   Pune    3000    2800    2023-03-02      0       false
179     carl    eleza   AAPL    Delhi   3000    2500    2023-01-10      0       false
184     rhys    larsen  AAPL    Delhi   1500    1800    2023-01-10      0       false
187     christian       harper  MSFT    Chennai 2300    1800    2023-01-10      0       false
190     christ  harper  MSFT    Hyderabad       2500    2800    2023-01-11      0       false
191     jonas   jules   SAMSUNG Delhi   1500    1800    2023-01-10      0       false
194     jonas   sandy   AAPL    Hyderabad       1500    1800    2023-01-10      0       false
195     jonas   jules   AAPL    Pune    2500    3800    2023-01-10      0       false
197     jones   katru   AAPL    Mumbai  2500    2300    2023-01-10      0       false
198     sandra  jules   MSFT    Chennai 3500    4000    2023-03-11      0       false
199     jonas   jules   AAPL    Hyderabad       1500    1800    2023-01-10      0       false
```

View showcasing non-profitable stocks data

RESULTS

- Reduced query response time.
- Enabled clear and detailed analysis of stock transaction data.
- Improved overall efficiency in data processing tasks.
- Improved decision-making.
- Achieved a unified approach in data handling, eliminating fragmentation
- Overcame scalability limitations.

CONCLUSION

- Hive utilizes batch processing for massive data examination
- Offers fault-tolerant system with HDFS for Big Data analysis
- Uses HiveQL, akin to SQL, for communication with large databases
- Project emphasizes optimization via views in Hive for real-time scenarios
- Focuses on stocks data for showcasing low-latency query handling

FUTURE ENHANCEMENT

- Integration of streaming data technologies (Kafka, Flink).
- Exploration of cost-based optimizers.
- Implementation of partitioning and bucketing strategies for data organization/
- Investigation into alternative query engines such as Presto and Trino.
- Continuous pursuit of enhancements to improve the speed, accuracy, and efficiency of real-time profit and loss analysis, fostering data-driven investment decisions.

THANK YOU

ANY QUERIES?