

**Department of Artificial Intelligence & Data Science****Vision of the Department***To be a well-known centre for pursuing computer education through innovative pedagogy, value-based education and industry collaboration.***Mission of the Department***To establish learning ambience for ushering in computer engineering professionals in core and multidisciplinary area by developing Problem-solving skills through emerging technologies.***Session 2025-2026****Vision:** Dream of where you want.**Mission:** Means to achieve Vision**Program Educational Objectives of the program (PEO):** (broad statements that describe the professional and career accomplishments)

PEO1	Preparation	P: Preparation	Pep-CL abbreviation pronounce as Pep-si-IL easy to recall
PEO2	Core Competence	E: Environment (Learning Environment)	
PEO3	Breadth	P: Professionalism	
PEO4	Professionalism	C: Core Competence	
PEO5	Learning Environment	L: Breadth (Learning in diverse areas)	

Program Outcomes (PO): (statements that describe what a student should be able to do and know by the end of a program)**Keywords of POs:**

Engineering knowledge, Problem analysis, Design/development of solutions, Conduct Investigations of Complex Problems, Engineering Tool Usage, The Engineer and The World, Ethics, Individual and Collaborative Team work, Communication, Project Management and Finance, Life-Long Learning

PSO Keywords: Cutting edge technologies, Research

“I am an engineer, and I know how to apply engineering knowledge to investigate, analyse and design solutions to complex problems using tools for entire world following all ethics in a collaborative way with proper management skills throughout my life.” to contribute to the development of cutting-edge technologies and Research.

Integrity: I will adhere to the Laboratory Code of Conduct and ethics in its entirety.**Name and Signature of Student and Date**

(Signature and Date in Handwritten)

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Session	2025-26 (ODD)	Course Name	BIG DATA AND HADOOP-LAB
Semester	7 AIDS	Course Code	22ADS704
Roll No	03	Name of Student	Debasrita Chattopadhyay

Practical Number	04
Course Outcome	1. Understand big data analytics and its business applications. 2. Analyze the HADOOP and Map Reduce technologies associated with big data analytics. 3. Apply Big Data analytics Using Pig and Hive.
Aim	Installation of Apache Hive on Linux with Hadoop Integration.
Problem Definition	Install Apache Hive on Linux with Hadoop
Theory (100 words)	<p>Hadoop is an open-source framework for distributed storage (HDFS) and parallel processing (MapReduce) of big data. Hadoop consists of: HDFS: The Hadoop Distributed File System - used for storing data. YARN: Yet Another Resource Negotiator - used for resource management. MapReduce or another engine: Used for processing data.</p> <p>Apache Hive is a data warehousing related tool built on top of Hadoop. It offers an SQL like language (HiveQL) to query large datasets located on your HDFS data store. Hive translates HiveQL into MapReduce, Tez or Spark jobs, dependent on how you configure it. Hive uses a metastore for storing its metadata e.g. table schemas, table locations, partitions, etc. The metastore can be an embedded database (Derby) or an RDBMS external to Hive (e.g. MySQL, PostgreSQL).</p>
Procedure and Execution (100 Words)	<p>Steps of Implementation: -</p> <p>Install Java & Hadoop</p> <ul style="list-style-type: none">● Ensure Java is installed.● Hadoop must be installed, configured, and running (HDFS + YARN). <p>Download and Extract Hive</p>



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- Get Hive from the official Apache site.
- Extract it to a directory (e.g., /usr/local/hive).

Set Environment Variables

- Add HIVE_HOME, HADOOP_HOME, and update PATH in .bashrc or .profile.

Configure Hive

- Edit hive-site.xml with:
 - Metastore connection settings
 - Warehouse directory path
- Set Java and Hadoop paths in hive-env.sh.

Initialize Hive Metastore

- Use Derby (default) for testing OR
- Configure MySQL/PostgreSQL for production.
- Run schema initialization command

Create HDFS Directories for Hive

- Create /user/hive/warehouse and set proper permissions.

Start Hive CLI or Beeline

- Use hive or beeline to run HiveQL queries.

Run Hive Queries

Create tables, insert data, and query data stored in HDFS.



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Code:

```
1 cd /usr/local
2 sudo wget https://dlcdn.apache.org/hive/hive-4.0.1/apache-hive-4.0.1-bin.tar.gz
3 sudo tar -xvzf apache-hive-4.0.1-bin.tar.gz
4 sudo mv apache-hive-4.0.1-bin hive
5 nano ~/.bashrc
6 source ~/.bashrc
7 echo $HADOOP_HOME
8 echo $HIVE_HOME
9 echo $PATH
10 hadoop version
11 ls /usr/local/hadoop
12 cd /usr/local
13 sudo
wget https://downloads.apache.org/hadoop/common/hadoop-3.3.6/hadoop-3.3.6.tar.gz
14 sudo tar -xvzf hadoop-3.3.6.tar.gz
15 sudo mv hadoop-3.3.6 hadoop
16 ls /usr/local/hadoop
17 sudo chmod -R 755 /usr/local/hadoop
18 source ~/.bashrc
19 hadoop version
20 java -version
```

Part 2: Integrate Apache Hive with Hadoop

```
1 cd /usr/local
2 sudo
wget https://downloads.apache.org/hadoop/common/hadoop-3.3.6/hadoop-3.3.6.tar.gz
3 sudo tar -xzf hadoop-3.3.6.tar.gz
4 sudo mv hadoop-3.3.6 hadoop
5 sudo chmod -R 755 /usr/local/hadoop
6 cd /usr/local
7 sudo wget https://dlcdn.apache.org/hive/hive-4.0.1/apache-hive-4.0.1-bin.tar.gz
8 sudo tar -xzf apache-hive-4.0.1-bin.tar.gz
9 sudo mv apache-hive-4.0.1-bin hive
10 sudo chmod -R 755 /usr/local/hive
11 nano ~/.bashrc
12 source ~/.bashrc
13 hadoop version
14 hive --version
15 hdfs namenode -format
```



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```
16 hdfs namenode &
17 hdfs datanode &
18 hdfs secondarynamenode &
19 yarn resourcemanager &
20 yarn nodemanager &
21 # HDFS daemons
22 hdfs namenode -format -force # first time only
23 hdfs namenode &
24 hdfs datanode &
25 hdfs secondarynamenode &
26 # YARN daemons
27 yarn resourcemanager &
28 yarn nodemanager &
29 jps
30 hive
```

Output:

```
theia@theiadocker-u22070346:/usr/local$ cd /usr/local
theia@theiadocker-u22070346:/usr/local$ sudo wget https://downloads.apache.org/hadoop/common/hadoop-3.3.6/hadoop-3.3.6.tar.gz
theia@theiadocker-u22070346:/usr/local$ sudo tar -xvzf hadoop-3.3.6.tar.gz
theia@theiadocker-u22070346:/usr/local$ sudo mv hadoop-3.3.6 hadoop
theia@theiadocker-u22070346:/usr/local$ ls /usr/local/hadoop
LICENSE.txt  NOTICE.txt  bin          include      libexec      sbin
theia@theiadocker-u22070346:/usr/local$ sudo chmod -R 755 /usr/local/hadoop
theia@theiadocker-u22070346:/usr/local$ source ~/.bashrc
theia@theiadocker-u22070346:/usr/local$ hadoop version
this command was run using /usr/local/hadoop/sbin/hadoop,
theia@theiadocker-u22070346:/usr/local$ java -version
theia@theiadocker-u22070346:/usr/local$ hdfs namenode -format
2025-10-05 12:07:53,405 INFO namenode.FSImage: FSImageSaver clean checkpoint: txid=
2025-10-05 12:07:53,406 INFO namenode.NameNode: SHUTDOWN_MSG:
/*****
SHUTDOWN_MSG: Shutting down NameNode at theiadocker-u22070346/172.17.63.229
*****/
theia@theiadocker-u22070346:/usr/local$ start-dfs.sh
theia@theiadocker-u22070346:/home/project$ cd /usr/local
theia@theiadocker-u22070346:/usr/local$ sudo wget https://dlcdn.apache.org/hive/hive-4.0.1/apache-hive-4.0.1-bin.tar.gz
theia@theiadocker-u22070346:/usr/local$ sudo tar -xvzf apache-hive-4.0.1-bin.tar.gz
theia@theiadocker-u22070346:/usr/local$ sudo mv apache-hive-4.0.1-bin hive
theia@theiadocker-u22070346:/usr/local$ nano ~/.bashrc

GNU nano 6.2 /home/theia/.bashrc
# Hadoop & Hive
export HADOOP_HOME=/usr/local/hadoop
export HIVE_HOME=/usr/local/hive
export PATH=$PATH:$HADOOP_HOME/bin:$HADOOP_HOME/sbin:$HIVE_HOME/bin
export HIVE_CONF_DIR=$HIVE_HOME/conf
export HADOOP_CLASSPATH=${HADOOP_HOME}/bin/hadoop classpath

theia@theiadocker-u22070346:/usr/local$ nano ~/.bashrc
theia@theiadocker-u22070346:/usr/local$ source ~/.bashrc
```



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	<pre>theia@theiadocker-u22070346:/usr/local\$ echo \$HADOOP_HOME echo \$HIVE_HOME hadoop version hive --version FROM SOURCE WITH CHECKSUM 454192480246139ede889cd90001c2ea theia@theiadocker-u22070346:/usr/local\$ hdfs namenode -format ***** theia@theiadocker-u22070346:/usr/local\$ start-dfs.sh start-yarn.sh theia@theiadocker-u22070346:/usr/local\$ jps theia@theiadocker-u22070346:/usr/local\$ # Start HDFS daemons hdfs namenode & hdfs datanode & hdfs secondarynamenode & # Start YARN daemons yarn resourcemanager & yarn nodemanager & theia@theiadocker-u22070346:/home/projects\$ cd /usr/local sudo wget https://downloads.apache.org/hadoop/common/hadoop-3.3.6/hadoop-3.3.6.tar.gz sudo tar -xzf hadoop-3.3.6.tar.gz sudo mv hadoop-3.3.6 hadoop sudo chmod -R 755 /usr/local/hadoop theia@theiadocker-u22070346:/usr/local\$ cd /usr/local sudo wget https://dlcdn.apache.org/hive/hive-4.0.1/apache-hive-4.0.1-bin.tar.gz sudo tar -xzf apache-hive-4.0.1-bin.tar.gz sudo mv apache-hive-4.0.1-bin hive sudo chmod -R 755 /usr/local/hive theia@theiadocker-u22070346:/usr/local\$ jps 7360 ResourceManager 7361 NodeManager 9082 Jps [6] Exit 1 hdfs namenode [7] Exit 1 hdfs datanode [8] Exit 1 hdfs secondarynamenode [9]- Exit 1 yarn resourcemanager [10]+ Exit 1 yarn nodemanager theia@theiadocker-u22070346:/usr/local\$</pre>
Output Analysis	Hive translates SQL-like queries into Hadoop jobs, executes them on HDFS data, and returns the results efficiently.
Link of student Github profile where lab assignment has been uploaded	
Conclusion	Installation of Apache Hive on Linux with Hadoop Integration implemented successfully.



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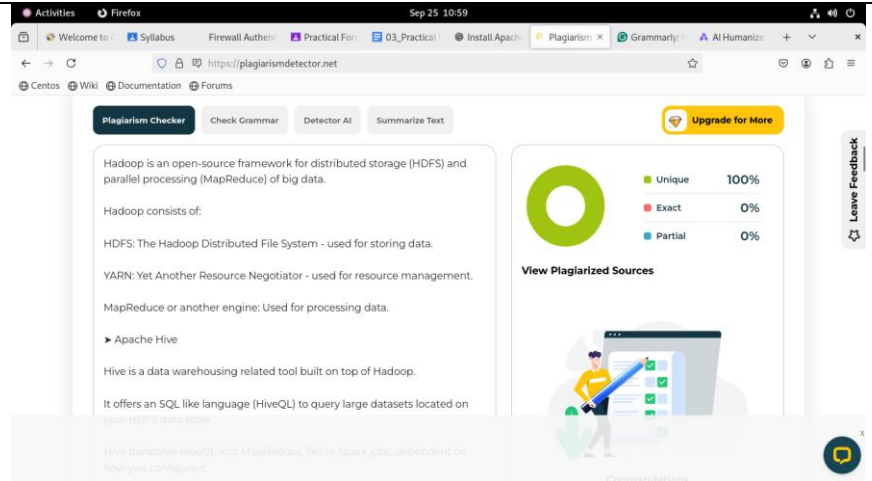
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