DEPARTMENT OF
COMPUTER SCIENCE & ENGINEERING
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Experiment 3.1

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Subject Name: Cloud Computing and Distributed System
Subject Code: 21CSP-378

1. Aim:

Install Hadoop single node cluster and run simple applications like word count.

2. Objective:

The Objective of this to Install Hadoop single node cluster and run simple applications like word count.

3. Procedure:

Install Java

Configure and install hadoop

Test hadoop installation

Create wordcount program

Input file to mapreduce

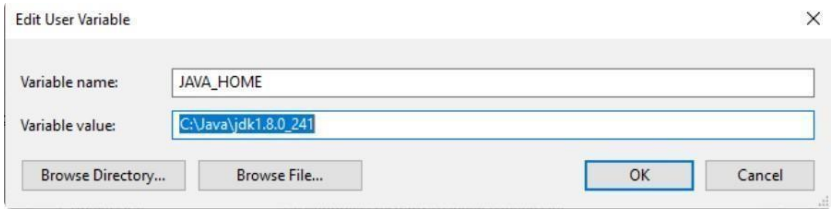
Display the output

4. Steps to Install Hadoop and run simple applications:

Step 1: JAVA Installation
Go to official Java Downloading page https://www.oracle.com/java/technologies/javase-jre8downloads.html
After downloading java, run the jdk-8u241-windows-x64.exe file
Follow the instructions and click next

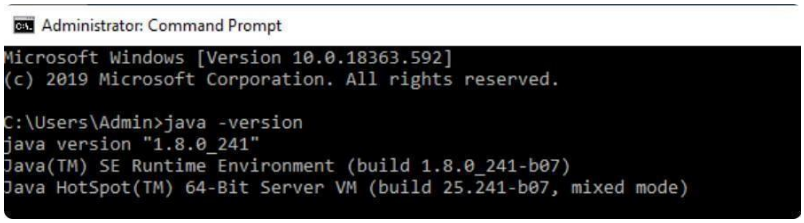
After finishing the installation it is need to set Java environment variable

Go to Start->Edit the System environment variable->Environment variable



Go to path and click edit then type "%JAVA_HOME%\bin"

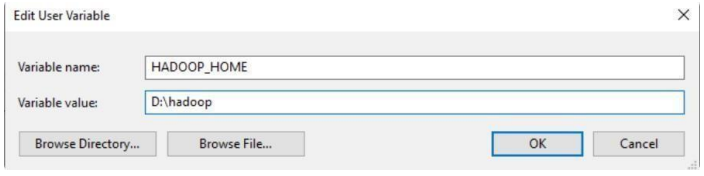
Then click Ok and Go to Command Prompt



Step 2: Configuring And Installing Hadoop

Download Hadoop 2.8.0 from http://archive.apache.org/dist/hadoop/core//hadoop-2.8.0/hadoop- 2.8.0.tar.gz)

Extract the tar file (in my case I used 7-zip to extract the file and I stored the extracted file in the D:\hadoop)



Go to path and click edit then type "%HADOOP_HOME%\bin"

Now we have to configure the hadoop.

Go to D:/hadoop/etc/hadoop/.. folder, find the below mentioned files and paste the following.

i.) Core.site.xml

```
<configuration>
<property>
<name>fs.defaultFS</name>
<value>hdfs://localhost:9000</value>
</property>
```

```
</configuration>
```

ii.) Rename "mapred-site.xml.template" to "mapred-site.xml" and edit this fileD:/Hadoop/etc/hadoop/mapred-site.xml, paste below xml paragraph and save this file.

```
<configuration>
 <property>
 &https://www.linkedin.com/redir/phishing-page?
url=lt%3Bname%26gt%3Bmapreduce%2eframework%2ename</name>
 <value>yarn</value>
 </property>
```

```
</configuration>
```

iii.) Create folder "data" under "D:\Hadoop"
Create folder "datanode" under "D:\Hadoop\data"
Create folder "namenode" under "D:\Hadoop\data" data

iv.) Edit file D:\Hadoop\etc\hadoop\hadoop-env.cmd by closing the command line "JAVA_HOME=%JAVA_HOME%" instead of set "JAVA_HOME= C:\Java\jdk1.8.0_241" (if your java file in Program Files the instead of give Progra~1 otherwise you will get JAVA_HOME incorrectly set error)

v.) Download file Hadoop Configuration.zip
https://github.com/Prithiviraj2503/hadoop-installation-windows

vi.) Delete file bin on D:\Hadoop\bin and replace it by the bin file of Downloaded configuration file (from Hadoop Configuration.zip).

vii.) Open cmd and typing command "hdfs namenode –format" .You will see through command prompt which tasks are processing, after competeation you will get a massage like namenode format succesfully and shutdown message

```
hdfs namenode -format
```

Step 3: Testing Hadoop Installation

Open Cmd and type the following “Hadoop -version”.

```
C:\Users\Admin>hadoop -version
java version "1.8.0_241"
Java(TM) SE Runtime Environment (build 1.8.0_241-b07)
Java HotSpot(TM) 64-Bit Server VM (build 25.241-b07, mixed mode)
```

To start the hadoop locate to “D:\hadoop\sbin” via command prompt and press startall.cmd

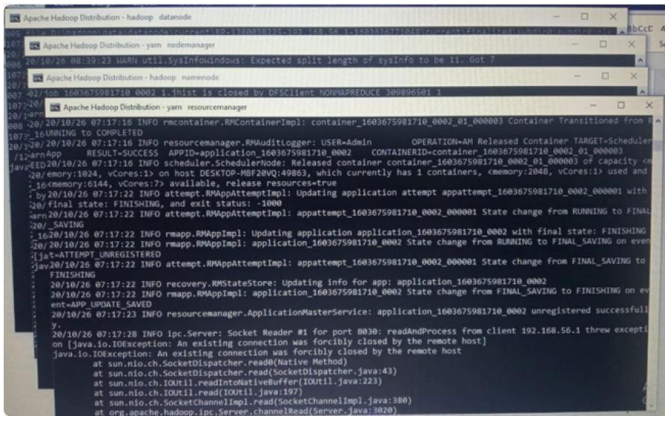
Administrator: Command Prompt

```
C:\Users\Admin>D:

D:\>cd hadoop/sbin

D:\hadoop\sbin>start-all.cmd
This script is Deprecated. Instead use start-dfs.cmd and start-yarn.cmd
starting yarn daemons
```

Now, you can see the namenode, datanode and yarn engines getting start,

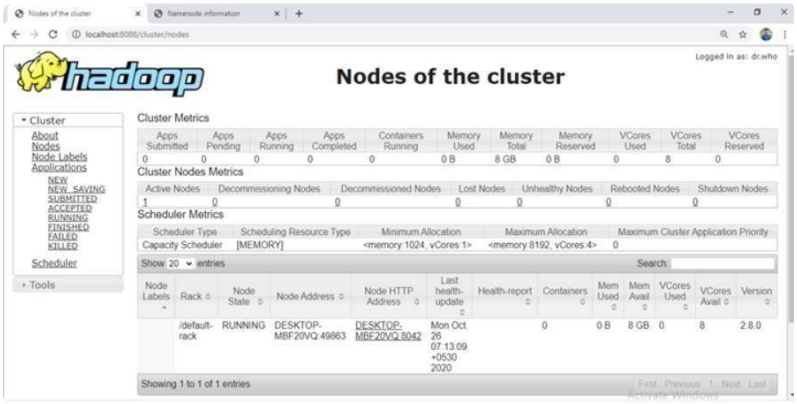


Now type “jps”. JPS (Java Virtual Machine Process Status Tool) is a command is used to check all the Hadoop daemons like NameNode, DataNode, ResourceManager, NodeManager etc.

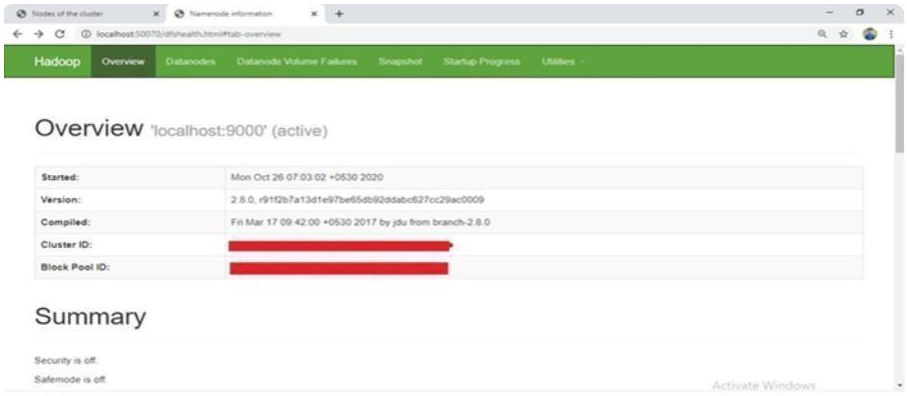
```
D:\hadoop\sbin>start-all.cmd
This script is Deprecated. Instead use start-dfs.cmd and start-yarn.cmd
starting yarn daemons

D:\hadoop\sbin>jps
5296 NameNode
2372 Jps
9192 ResourceManager
10140 NodeManager
9420 DataNode
```

Open: http://localhost:8088 in any browser



Open: http://localhost:50070 in any browser



Now hadoop succesfully installed in your System.

Step 4: Simple WordCount Program

After successful hadoop installation we need to create an directory in the hadoop file system

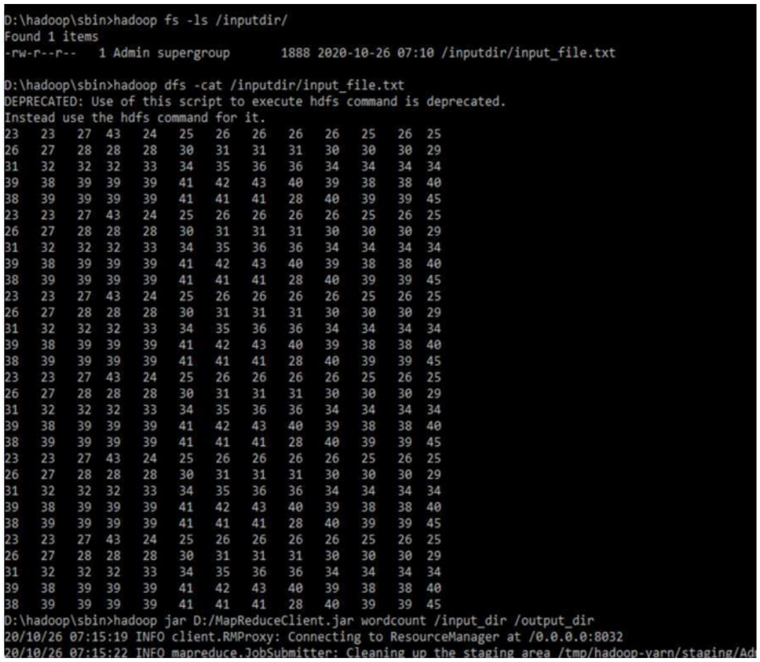
Start the hadoop via command prompt $ start-all.cmd

To input a file within a directory, use: $ hadoop fs –put D:/input_file.txt/inputdir

To ensure wether your file succesfully imported, use: $ hadoop fs –ls /inputdir/

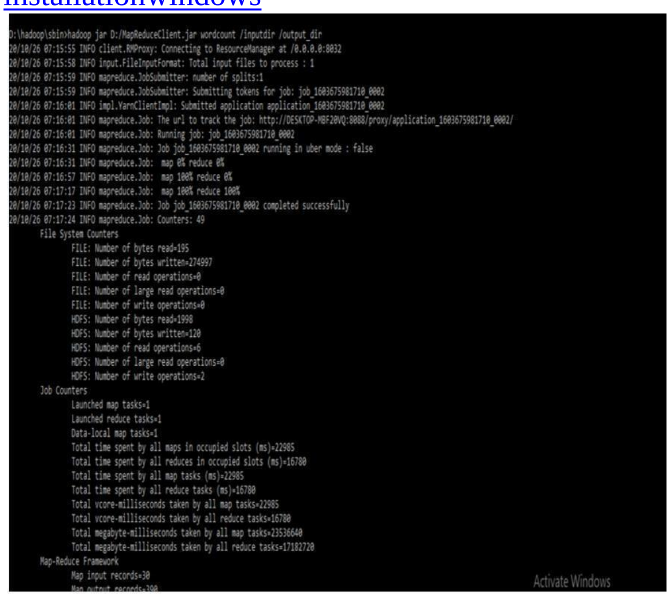
To view the content of the file, use: $ hadoop dfs –cat /inputdir/input_file.txt

Link for input file : https://github.com/Prithiviraj2503/hadoop-installation-windows

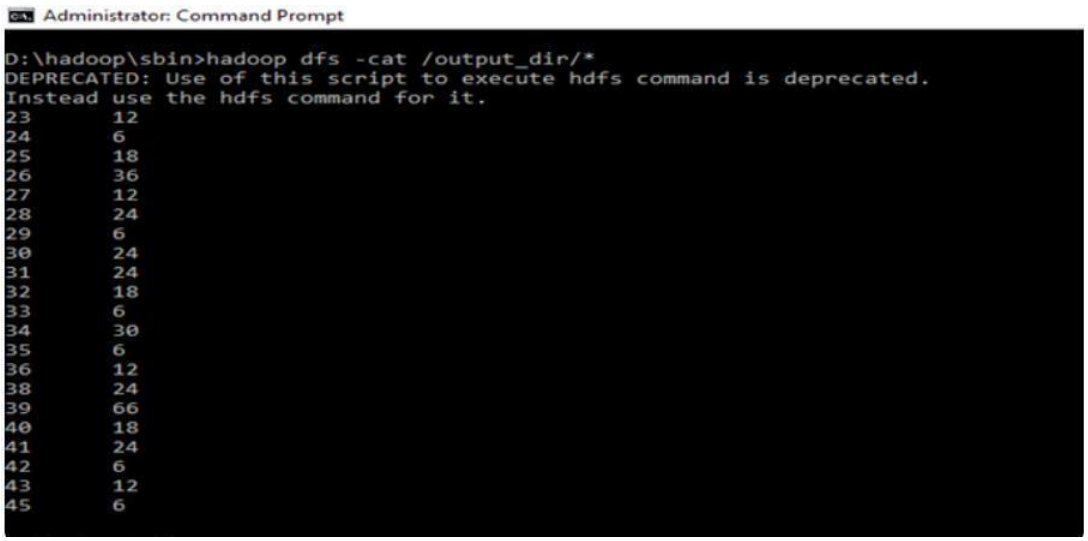


Now appy mapreduce program to the input file. We have a mapReduceClient.jar which contain java mapper and reducer programs. After applying the jar file you can see the task performed in the mapreduce phase.All the resuts of completed tasks will be printed in the command prompt.

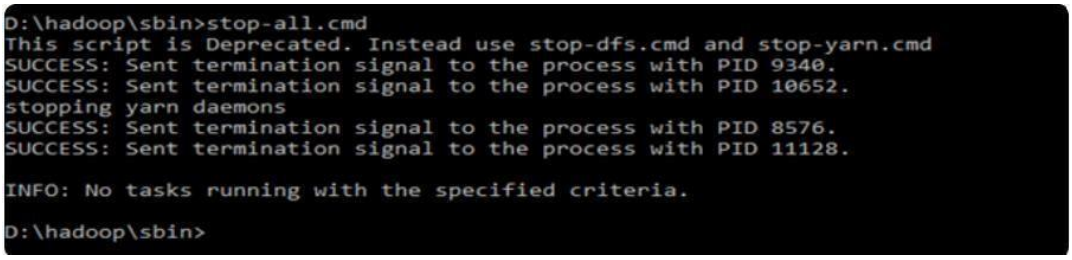
Link for mapReduceClient.jar : https://github.com/Prithiviraj2503/hadoop-installationwindows



After completed the mapreduce tasks the output will be stored in the output_dir directory To see the output, use: $ hadoop dfs –cat /output_dir/



To stop the hadoop type $stop-all.cmd



Result: Now the Hadoop single node cluster was installed successfully and the simple word count program were executed successfully in your windows system.

Learning Outcomes:

1. Learnt about Hadoop.
2. Learnt about its Hadoop's implementation.