SPARK – INSTALLATION

The following steps show how to install Apache Spark.

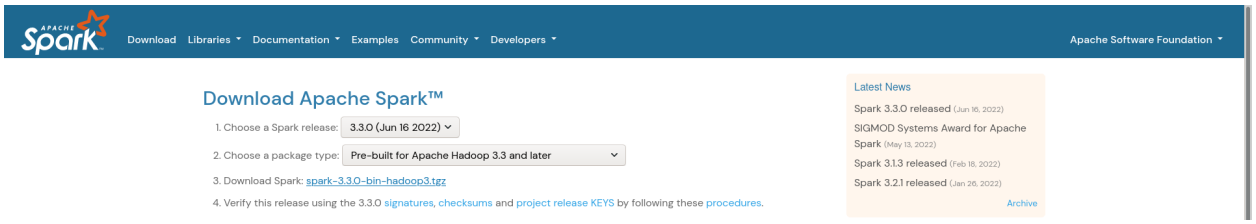
Step 1: Verifying Java Installation

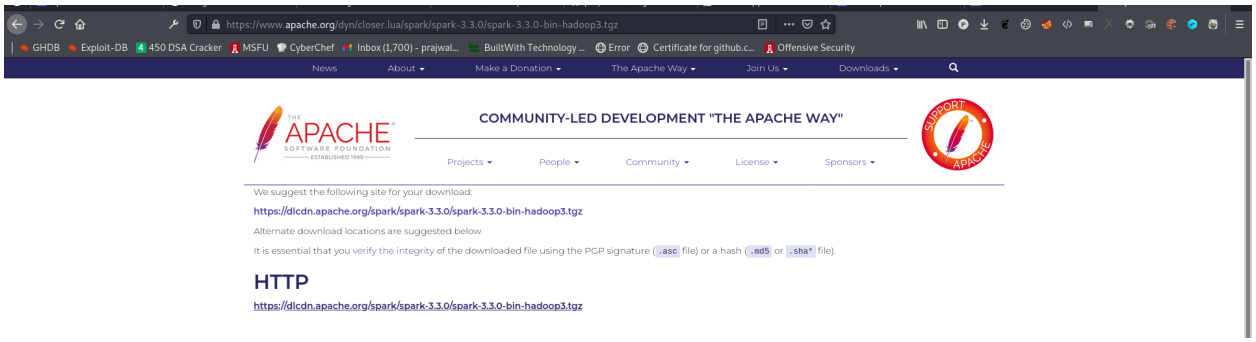
If Java is already installed on your system, you get to see the following response or some other versions.

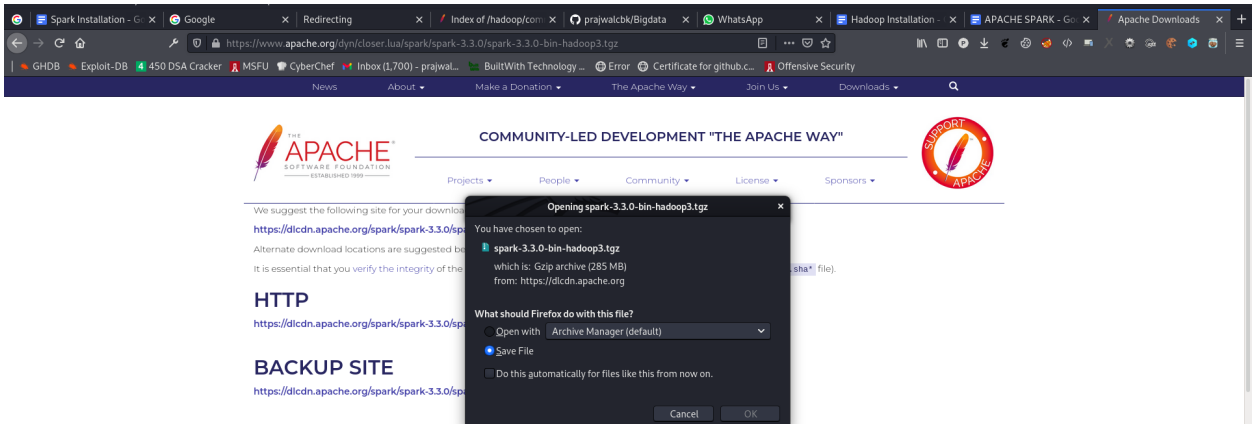
```
root@kali:~# java --version
openjdk 11.0.11-ea 2021-04-20
OpenJDK Runtime Environment (build 11.0.11-ea+4-post-Debian-1)
OpenJDK 64-Bit Server VM (build 11.0.11-ea+4-post-Debian-1, mixed mode, sharing)
```

Step 2: Downloading Apache Spark

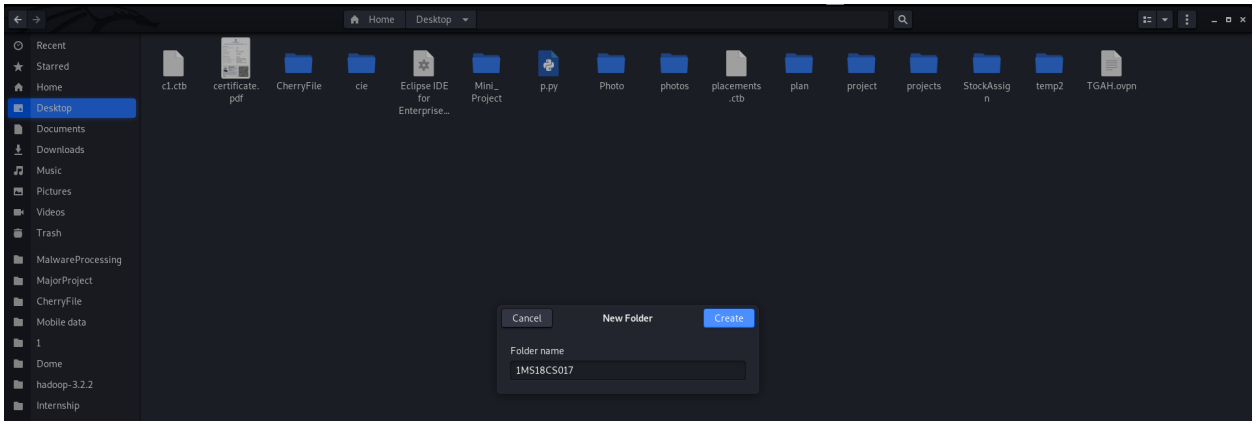
Download the latest version of Spark by visiting the following link Download Spark https://spark.apache.org/downloads.html . Select the latest version in Spark release and select pre-built for Apache Hadoop 3.3 and later . Click on the Download Spark link . It will navigate to one more page , and use HTTP to download the file . After downloading it, you will find the Spark tar file in the download folder.



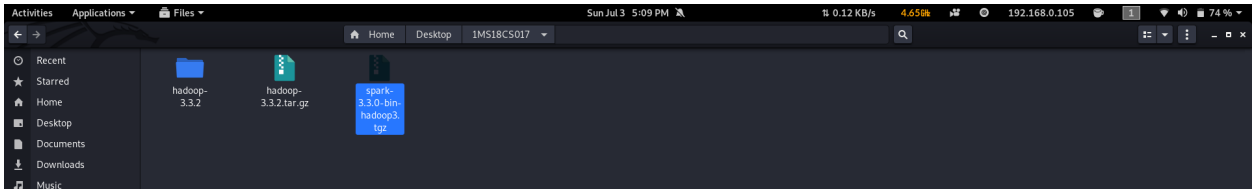




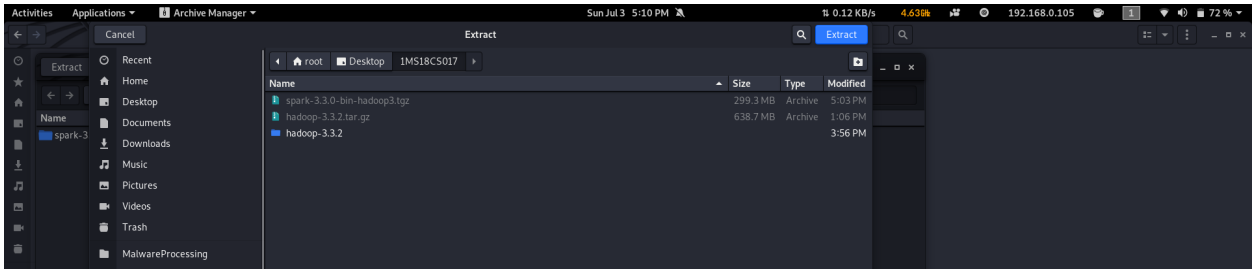
Step 3: Create a new Folder inside Desktop , name the Folder as your USN <1ms18cs017>.



Step 4 . Move the Downloaded Spark File to USN <1ms18cs017> Folder.



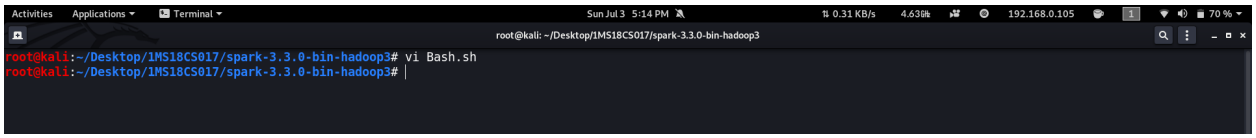
Step 5. Right Click on that File and Extract inside the USN <1ms18cs017> Folder.



Step 6:. Open Terminal

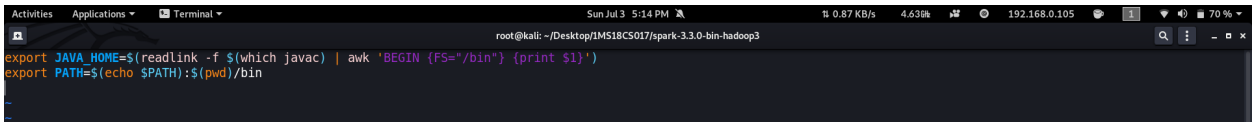
Navigate to Extracted Hadoop Folder cd ~/Desktop/<1ms18cs017>/spark-3.3.0-bin-hadoop3

7. Create a New File named Bash.sh



8. Copy the Below code and Paste inside Bash.sh and save that File.

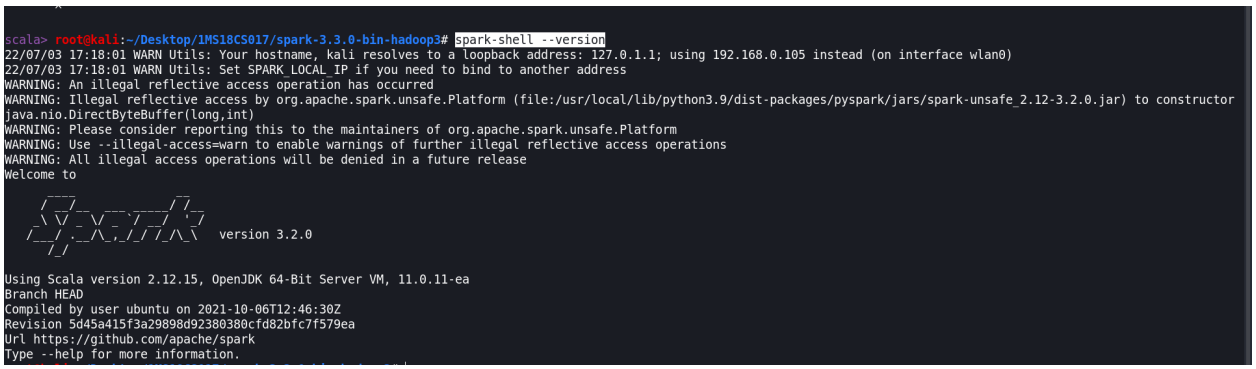
```
export JAVA_HOME=$(readlink -f $(which javac) | awk 'BEGIN {FS="/bin"} {print $1}')
if ! command -v spark-shell --version &> /dev/null
then
    export PATH=$(echo $PATH):$(pwd)/bin
fi
```



9. Execute the bash.sh File using following command source Bash.sh.
NOTE: Make source before compiling or running spark compile this file.

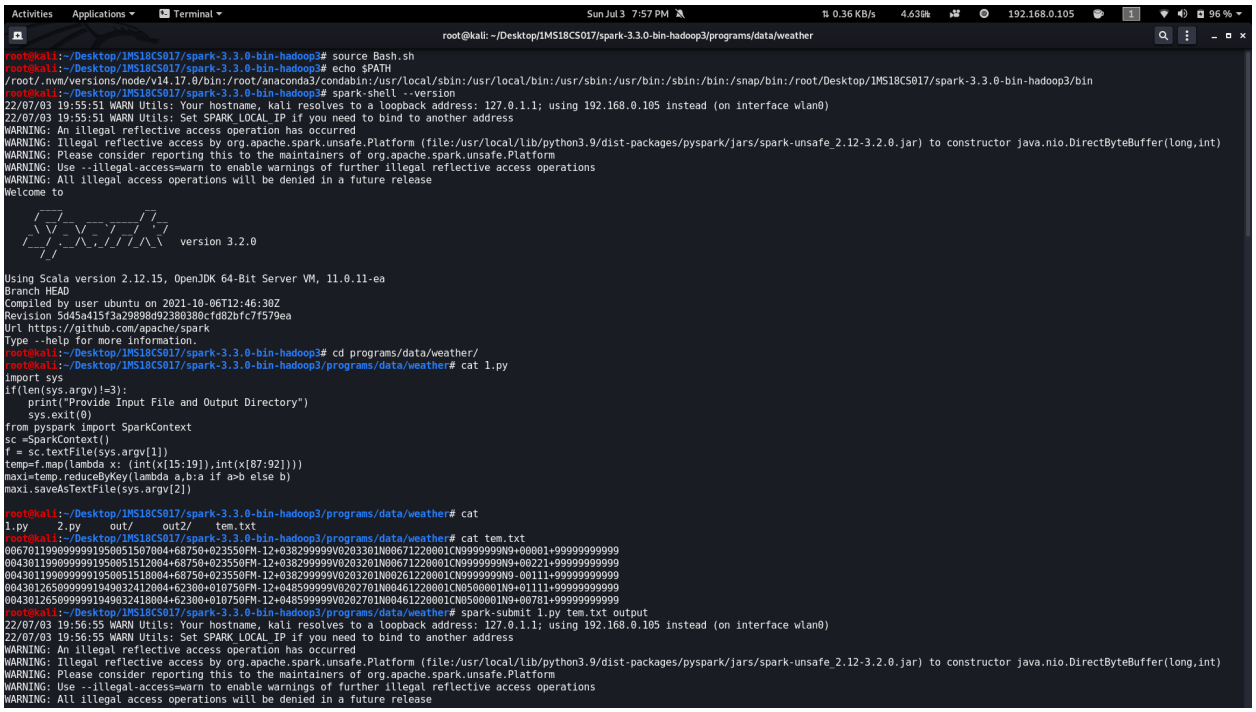
10. Verify JAVA_HOME variable to be set to Java Path and PATH variable has your USN Spark Folder.If any previous PATH set to Spark Folder remove that inside .bashrc file.

11. Verify Hadoop is Installed or not by executing spark-shell --version command.if command gives Information about Hadoop command then Hadoop is Successfully Installed.

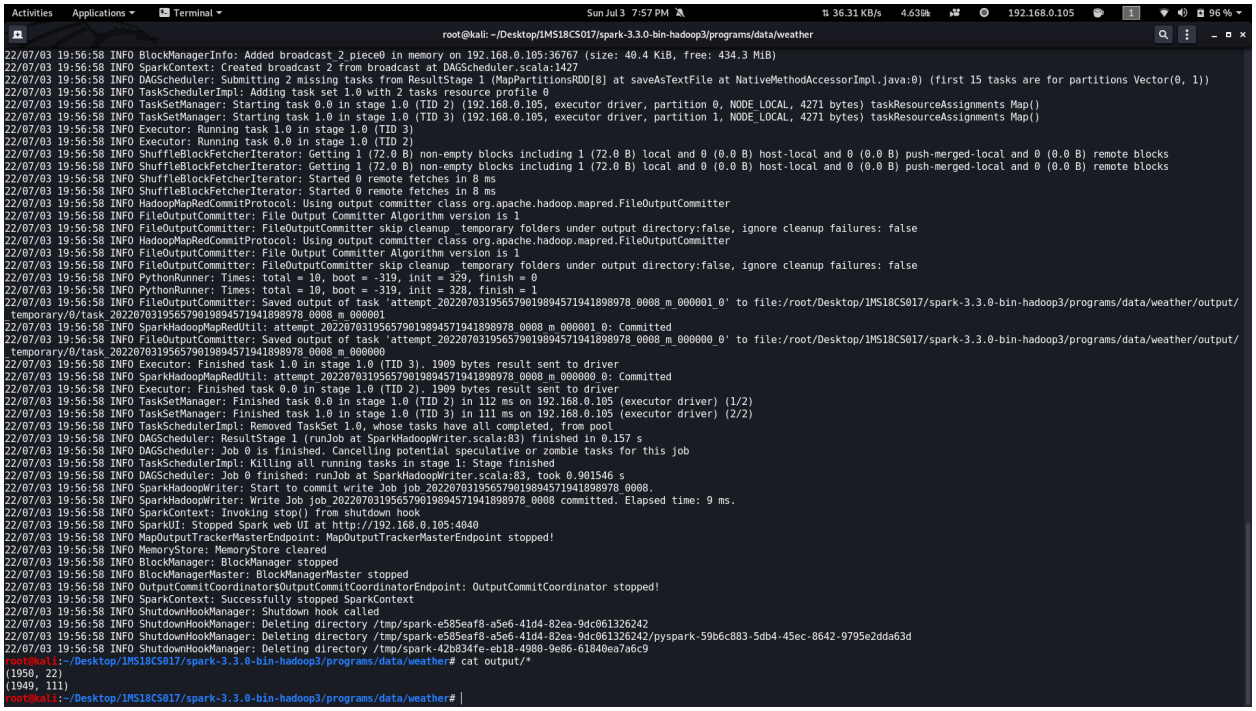


Execute all spark python files with spark-submit<python_filename>.py <inputFile> <outputfolder>

Write a spark to analyze the given weather report data and to generate a report with cities having maximum temperature for a particular year



```
import sys
if(len(sys.argv)!=3):
        print("Provide Input File and Output Directory")
        sys.exit(0)
from pyspark import SparkContext
sc =SparkContext()
f = sc.textFile(sys.argv[1])
temp=f.map(lambda x: (int(x[15:19]),int(x[87:92])))
maxi=temp.reduceByKey(lambda a,b:a if a>b else b)
maxi.saveAsTextFile(sys.argv[2])
```



Write a spark to analyze the given weather report data and to generate a report with cities having minimum temperature for a particular year

```
import sys
if(len(sys.argv)!=3):
        print("Provide Input File and Output Directory")
        sys.exit(0)
from pyspark import SparkContext
sc =SparkContext()
f = sc.textFile(sys.argv[1])
temp=f.map(lambda x: (int(x[15:19]),int(x[87:92])))
mini=temp.reduceByKey(lambda a,b:a if a<b else b)
```

```
mini.saveAsTextFile(sys.argv[2])
```

Write a spark program to analyze the given Earthquake data and generate statistics with region and magnitude

```
import sys
if(len(sys.argv)!=3):
        print("Provide Input File and Output Directory")
        sys.exit(0)
from pyspark import SparkContext
sc =SparkContext()
f = sc.textFile(sys.argv[1])
temp=f.map(lambda x: (x.split(',')[11],float(x.split(',')[8])))
maxi=temp.reduceByKey(lambda a,b:a if a>b else b)
maxi.saveAsTextFile(sys.argv[2])
```

Write a spark program to analyze the given Earthquake data and generate statistics with region and depth

```
import sys
if(len(sys.argv)!=3):
        print("Provide Input File and Output Directory")
        sys.exit(0)
from pyspark import SparkContext
sc =SparkContext()
f = sc.textFile(sys.argv[1])
temp=f.map(lambda x: (x.split(',')[11],float(x.split(',')[9])))
maxi=temp.reduceByKey(lambda a,b:a if a>b else b)
maxi.saveAsTextFile(sys.argv[2])
```

Write a spark program to analyze the given Earthquake data and generate statistics with region and latitude

```
import sys
if(len(sys.argv)!=3):
        print("Provide Input File and Output Directory")
        sys.exit(0)
from pyspark import SparkContext
sc =SparkContext()
f = sc.textFile(sys.argv[1])
temp=f.map(lambda x: (x.split(',')[11],float(x.split(',')[6])))
maxi=temp.reduceByKey(lambda a,b:a if a>b else b)
maxi.saveAsTextFile(sys.argv[2])
```

Write a spark program to analyze the given Earthquake data and generate statistics with region and longitude

```
import sys
if(len(sys.argv)!=3):
        print("Provide Input File and Output Directory")
        sys.exit(0)
from pyspark import SparkContext
sc =SparkContext()
f = sc.textFile(sys.argv[1])
temp=f.map(lambda x: (x.split(',')[11],float(x.split(',')[7])))
maxi=temp.reduceByKey(lambda a,b:a if a>b else b)
maxi.saveAsTextFile(sys.argv[2])
```

Write a spark program to analyze the given Insurance data and generate a statistics report with the construction building name and the count of building.

```
        import sys
        if(len(sys.argv)!=3):
                print("Provide Input File and Output Directory")
                sys.exit(0)
        from pyspark import SparkContext
        sc =SparkContext()
        f = sc.textFile(sys.argv[1])
        temp=f.map(lambda x: (x.split(',')[16],1))
        data=temp.countByKey()
        dd=sc.parallelize(data.items())
        dd.saveAsTextFile(sys.argv[2])
```

Write a spark program to analyze the given Insurance data and generate a statistics report with the county name and its frequency.

```
import sys
if(len(sys.argv)!=3):
        print("Provide Input File and Output Directory")
        sys.exit(0)
from pyspark import SparkContext
sc =SparkContext()
f = sc.textFile(sys.argv[1])
temp=f.map(lambda x: (x.split(',')[2],1))
data=temp.countByKey()
dd=sc.parallelize(data.items())
dd.saveAsTextFile(sys.argv[2])
```

Write a map-reduce program to analyze the given employee record data and generate a statistics report with the total Sales for female and male employees

```
import sys
if(len(sys.argv)!=3):
        print("Provide Input File and Output Directory")
        sys.exit(0)
from pyspark import SparkContext
sc =SparkContext()
f = sc.textFile(sys.argv[1])
temp=f.map(lambda x: (x.split('\t')[3],float(x.split('\t')[8])))
total=temp.reduceByKey(lambda a,b : a+b)
total.saveAsTextFile(sys.argv[2])
```

Write a map-reduce program to analyze the given sales records over a period of time and generate data about the country's total sales, and the total number of the products

```
import sys
if(len(sys.argv)!=3):
        print("Provide Input File and Output Directory")
        sys.exit(0)
from pyspark import SparkContext
sc =SparkContext()
f = sc.textFile(sys.argv[1])
temp=f.map(lambda x: (x.split(',')[7],1))
data=temp.countByKey()
dd=sc.parallelize(data.items())
dd.saveAsTextFile(sys.argv[2])
```

Write a map-reduce program to analyze the given sales records over a period of time and generate data about the country's total sales and the frequency of the payment mode.

```
import sys
if(len(sys.argv)!=3):
        print("Provide Input File and Output Directory")
        sys.exit(0)
from pyspark import SparkContext
sc =SparkContext()
f = sc.textFile(sys.argv[1])
temp=f.map(lambda x: (x.split(',')[3],1))
```

```
data=temp.countByKey()
dd=sc.parallelize(data.items())
dd.saveAsTextFile(sys.argv[2])
```