BIG DATA ANALYTICS

INDEX

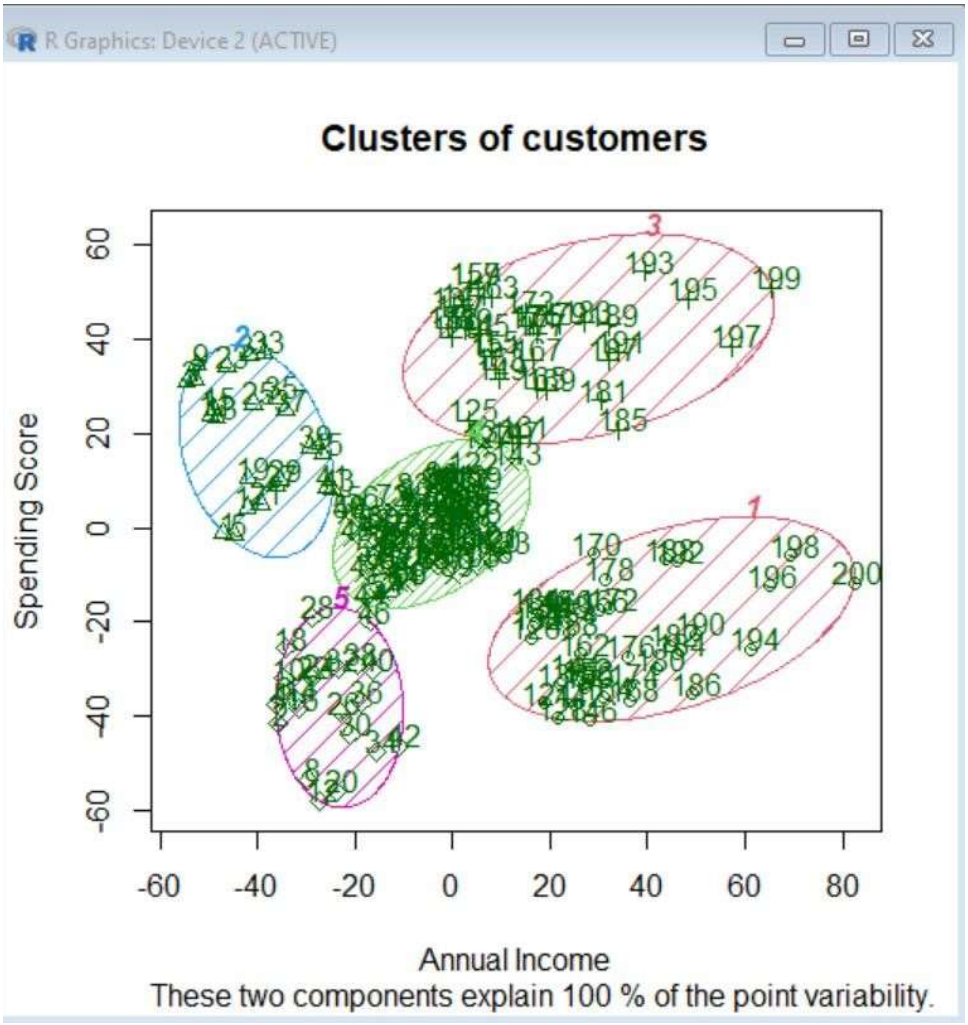
Practical No. 01

Aim: A) Clustering algorithms for unsupervised classification. Read a datafile all_Customers.csv and apply k-means clustering. Plot the cluster data using R visualizations.

Code:

```
# K-Means Clustering

# Importing the dataset
dataset = read.csv("D:\\bda prac\\Mall_Customers.csv")
head(dataset)
dataset = dataset[4:5]
head(dataset)

wcss = vector()
for (i in 1:10) wcss[i] = sum(kmeans(dataset, i)$withinss)
plot(1:10,
    wcss,
    type = 'b',
    main = paste('The Elbow Method'),
    xlab = 'Number of clusters',
    ylab = 'WSS')

# Fitting K-Means to the dataset with no of clusters = 5
kmeans = kmeans(x = dataset, centers = 5)
y_kmeans = kmeans$cluster

# Visualising the clusters
library(cluster)
clusplot(dataset,
        y_kmeans,
        lines =  0,
        shade = TRUE,
        color = TRUE,
        labels = 2,
        main = paste('Clusters of customers'),
        xlab = 'Annual Income',
        ylab = 'Spending Score')
```

Output:

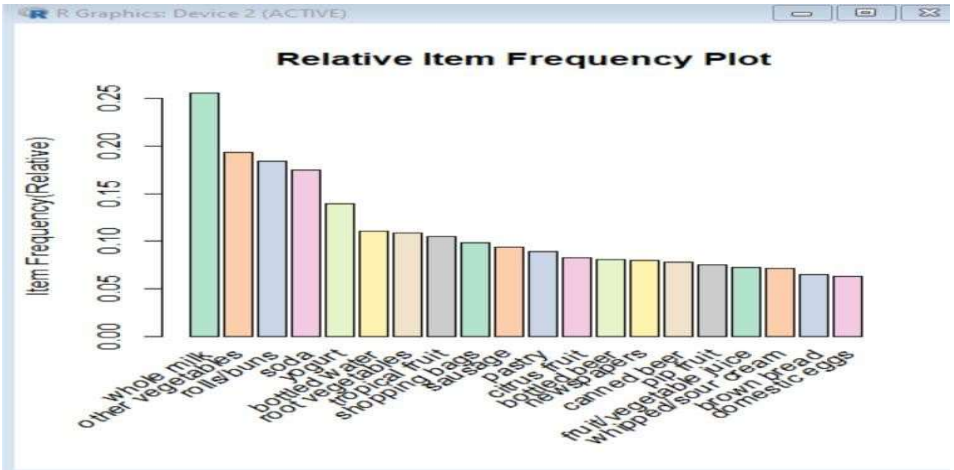

R Graphics: Device 2 (ACTIVE)
Clusters of customers
Spending Score
Annual Income
These two components explain 100 % of the point variability.

Aim: B) Implement Apriori Algorithm Recommending grocery items to a customer that is most frequently bought together, given a data set of transactions by customers of a store, using built-in Groceries file.

Code:

```
install.packages("arules")
install.packages("arulesViz")
install.packages("RColorBrewer")
library(arules)
library(arulesViz)
library(RColorBrewer)
data("Groceries")
Groceries
summary(Groceries)
class(Groceries)
rules = apriori(Groceries, parameter = list(supp = 0.02, conf = 0.2))
summary(rules)
inspect(rules[1:10])
arules::itemFrequencyPlot(Groceries, topN = 20,
                          col = brewer.pal(8, 'Pastel2'),
                          main = 'Relative Item Frequency Plot',
                          type = "relative",
                          ylab = "Item Frequency(Relative)")
itemset = apriori(Groceries, parameter = list(minlen=2, maxlen=2, support=0.02,
target="frequent itemset") )
summary(itemset)
inspect(itemset[1:10])
itemsets_3 = apriori(Groceries, parameter = list(minlen=3, maxlen=3, support=0.02,
target="frequent itemset"))
summary(itemsets_3)
inspect(itemsets_3)
```

Output:



Practical No. 02

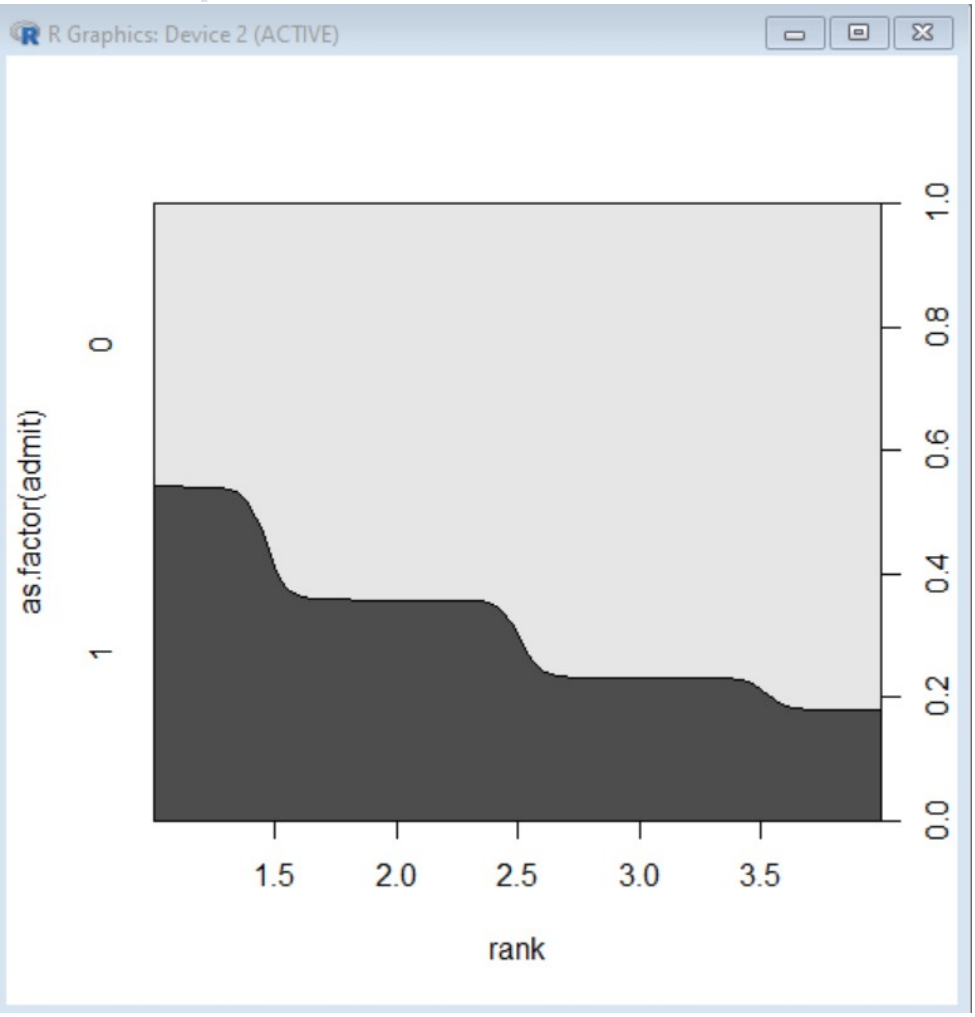
Aim: A) Import data from web storage – binary.csv. Name the dataset and do Logistic Regression to find out relation between variables that are affecting the admission of a student in an institute based on his or her GRE score, GPA obtained and rank of the student. Also check the model is fit or not.

Code:

```
#fetch the data
college <- read.csv("D:\\bda prac\\binary.csv")
head(college)
nrow(college)

install.packages("caTools")    # For Logistic regression
library(caTools)

split <- sample.split(college, SplitRatio = 0.75)
split

training_reg <- subset(college, split == "TRUE")
test_reg <- subset(college, split == "FALSE")

# Training  model
fit_logistic_model <- glm(admit ~ .,
                  data = training_reg,
                  family = "binomial")

# Predict test data based on model
predict_reg <- predict(fit_logistic_model,
                   test_reg, type = "response")
predict_reg

cdplot(as.factor(admit)~  gpa,  data=college)
cdplot(as.factor(admit)~  gre,  data=college)
cdplot(as.factor(admit)~ rank, data=college)


# Changing probabilities
predict_reg <- ifelse(predict_reg >0.5, 1, 0)
predict_reg


# Evaluating model accuracy
# using confusion matrix
table(test_reg$admit, predict_reg)
```

Output:

```
> table(test_reg$admit, predict_reg)
   predict_reg
      0  1
  0 59  3
  1 28 10
```

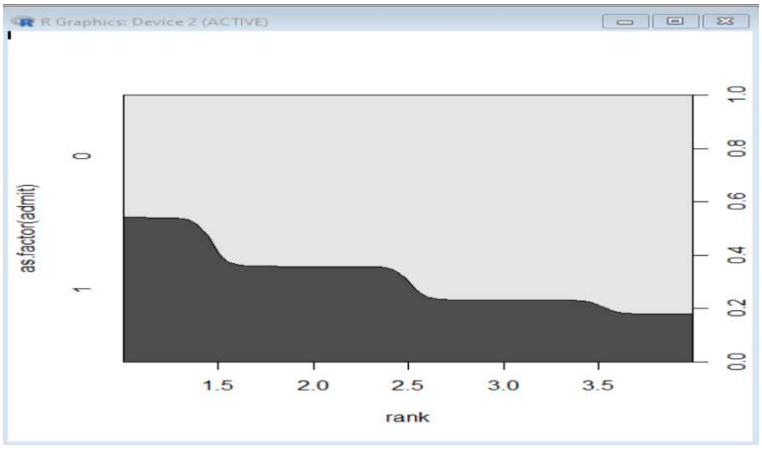


Aim: B) Apply multiple regressions, if data have a continuous independent variable. Apply on above dataset – binary.csv.

Code:

```
#fetch the data
college <- read.csv("D:\\bda prac\\binary.csv")
head(college)
nrow(college)

install.packages("caTools")    # For Logistic regression
library(caTools)

split <- sample.split(college, SplitRatio = 0.75)
split

training_reg <- subset(college, split == "TRUE")
test_reg <- subset(college, split == "FALSE")

# Training model
fit_MRegressor_model <- lm(formula = admit ~ gre+gpa+rank,
                  data = training_reg)

# Predict test data based on model
predict_reg <- predict(fit_MRegressor_model,
                   newdata = test_reg)
predict_reg

cdplot(as.factor(admit)~  gpa,  data=college)
cdplot(as.factor(admit)~  gre,  data=college)
cdplot(as.factor(admit)~ rank, data=college)
```

Output:



Practical No. 03

Aim: A) Implement Decision Tree classification technique using Social_Network_Ads.csv dataset.

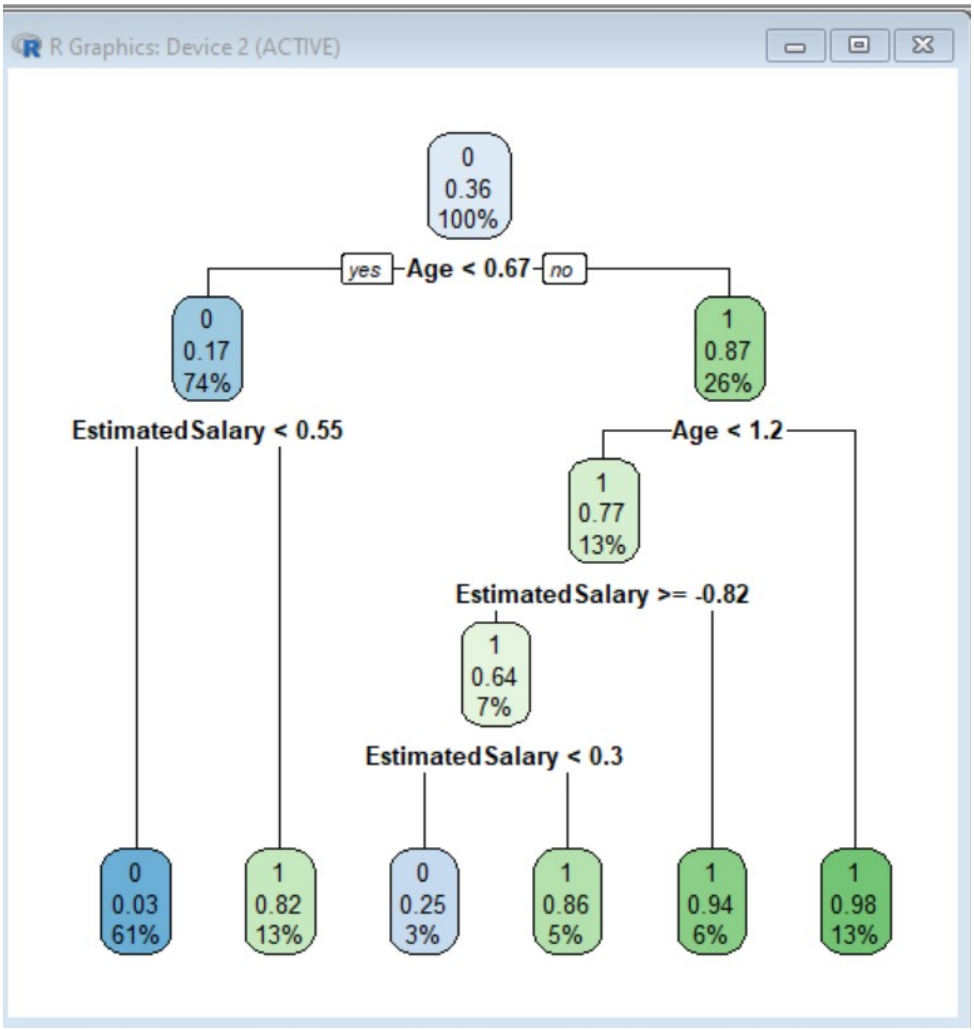
Code:

```
# Decision Tree Classification

# Importing the dataset
dataset = read.csv("D:\\bda prac\\Social_Network_Ads.csv")
#print(dataset)
dataset = dataset[3:5] # columns 3 4 ad 5
print(dataset)

# Encoding the target feature as factor(just like a vector having levels
# levels to convey that only two possible values for purchased - 0 & 1
dataset$Purchased = factor(dataset$Purchased, levels = c(0, 1))
print (dataset$Purchased)

# Splitting the dataset into the Training set and Test set
install.packages('caTools')
library(caTools)
set.seed(123)
#split = sample.split(dataset$Purchased, SplitRatio = 0.75)
split = sample.split(dataset$Purchased, SplitRatio = 0.75)
training_set = subset(dataset, split == TRUE)
test_set = subset(dataset, split == FALSE)

# Feature Scaling - scale() method centers and/or scales the columns of a numeric matrix.
training_set[-3] = scale(training_set[-3]) # scaling first 2 columns, don't consider 3rd column
test_set[-3] = scale(test_set[-3])
#print(test_set[-3])

# Fitting Decision Tree Classification to the Training set
install.packages('rpart')
library(rpart) # for partitioning tree
install.packages('rpart.plot')
library(rpart.plot)

classifier = rpart(formula = Purchased ~ .,data = training_set)

# Predicting the Test set results
y_pred = predict(classifier, newdata = test_set[-3], type = 'class')
print(y_pred)

# Making the Confusion Matrix
cm = table(test_set[, 3], y_pred)
print(cm)

y_grid = predict(classifier, newdata = grid_set, type = 'class')
```

```
# Plotting the tree
#extra=106 class model with a binary response
#extra=104 class model with a response having more than two levels
rpart.plot(classifier, extra = 106)
```

Output:

```
> cm = table(test_set[, 3], y_pred)
> print(cm)
   y_pred
     0  1
  0 53 11
  1  6 30
```



Aim: B) Implement SVM Classification technique using Social_Network_Ads.csv dataset. Evaluate the performance of classifier.

Code:

```
# Support Vector Machine (SVM)

# Importing the dataset
dataset = read.csv("D:\\bda prac\\Social_Network_Ads.csv")
dataset = dataset[3:5]
print(dataset)
print(dataset$Purchased)
# Splitting the dataset into the Training set and Test set
install.packages('caTools')
library(caTools)
set.seed(123)
split = sample.split(dataset$Purchased, SplitRatio = 0.75)
training_set = subset(dataset, split == TRUE)
print(training_set)
test_set = subset(dataset, split == FALSE)
print(test_set)
# Feature Scaling
training_set[-3] = scale(training_set[-3]) # [-3] means 3rd index will be dropped
test_set[-3] = scale(test_set[-3])
print(training_set[-3])
print (test_set[-3])
# Fitting SVM to the Training set
install.packages('e1071')
library(e1071)
classifier = svm(formula = Purchased ~ .,
                 data = training_set,
                 type = 'C-classification',
                 kernel = 'linear')
print (classifier)

# Predicting the Test set results
y_pred = predict(classifier, newdata = test_set[-3])
print(y_pred)

# Making the Confusion Matrix
cm = table(test_set[, 3], y_pred)
print (cm)
```

Output:

```
> cm = table(test_set[, 3], y_pred)
> print (cm)
   y_pred
     0  1
  0 57  7
  1 13 23
```

Practical No. 04

Aim: A) Implement Naïve Bayes Classification technique using Social_Network_Ads.csv dataset. Evaluate the performance of classifier.

Code:

```
# Naive Bayes
# Importing the dataset
dataset = read.csv('C:\\2022-23\\BDA practical 2023\\Social_Network_Ads.csv')
dataset = dataset[3:5]
# Encoding the target feature as factor
dataset$Purchased = factor(dataset$Purchased, levels = c(0, 1))
# Splitting the dataset into the Training set and Test set
#install.packages('caTools')
library(caTools)
set.seed(123)
split = sample.split(dataset$Purchased, SplitRatio = 0.75)
training_set = subset(dataset, split == TRUE)
test_set = subset(dataset, split == FALSE)
# Feature Scaling
training_set[-3] = scale(training_set[-3])
test_set[-3] = scale(test_set[-3])
# Fitting Naive Bayes to the Training set
install.packages('e1071')
library(e1071)
classifier = naiveBayes(x = training_set[-3],
                        y = training_set$Purchased)
# Predicting the Test set results
y_pred = predict(classifier, newdata = test_set[-3])
# Making the Confusion Matrix
cm = table(test_set[, 3], y_pred)
print(cm)
```

Output:

```
> cm = table(test_set[, 3], y_pred)
> print(cm)
   y_pred
     0  1
  0 57  7
  1  7 29
```

Aim: B) Find the confusion matrix to find restaurant review based of sentiment analysis of Natural Language processing. Use Resaurentreviews.tsv file for your study.

Code:

```
dataset_original = read.delim("D:\\bda prac\\Restaurant_Reviews.txt", quote = '',
stringsAsFactors = FALSE)
install.packages('tm')
install.packages('SnowballC')
library(tm)
library(SnowballC)
corpus = VCorpus(VectorSource(dataset_original$Review))
corpus = tm_map(corpus, content_transformer(tolower))
corpus = tm_map(corpus, removeNumbers)
corpus = tm_map(corpus, removePunctuation)
corpus = tm_map(corpus, removeWords, stopwords())
corpus = tm_map(corpus, stemDocument)
corpus = tm_map(corpus, stripWhitespace)
dtm =  DocumentTermMatrix(corpus)
dtm = removeSparseTerms(dtm, 0.999)
dataset = as.data.frame(as.matrix(dtm))
dataset$Liked = dataset_original$Liked
print(dataset$Liked)
dataset$Liked = factor(dataset$Liked, levels = c(0,1))
install.packages(caTools)
library(caTools)
set.seed(123)
split = sample.split(dataset$Liked, SplitRatio = 0.8)
training_set = subset(dataset, split == TRUE)
test_set = subset(dataset, split == FALSE)
install.packages('randomForest')
library(randomForest)
classifier = randomForest(x = training_set[-692],
                          y = training_set$Liked,
                          ntree = 10)
y_pred = predict(classifier, newdata = test_set[-692])
cm = table(test_set[,692], y_pred)
print(cm)
```

Output:

```
> cm = table(test_set[,692], y_pred)
> print(cm)
   y_pred
     0  1
  0 82 18
  1 23 77
>
```

Practical No. 05

Aim: Take the inbuilt data file: iris and perform classification on that data using various classification models – Decision Tree, K Nearest Neighbour and Support Vector Machine. Find the confusion matrix for all three models and evaluate them by finding their accuracy. Find the algorithm which performs best on the given data file, out of all these three models.

Code:

```
#PBL
install.packages('rpart')
install.packages('rpart.plot')
install.packages('gmodels')
install.packages('e1071')
library(rpart)
library(rpart.plot)
library(gmodels)
library(e1071)

data(iris)
summary(iris)

#normalize the continuous variables before performing any analysis on the dataset
temp = as.data.frame(scale(iris[,1:4]))
temp$Species = iris$Species # levels: setosa versicolor virginica
summary(temp)

# Splitting the dataset into the Training set and Test set
install.packages('caTools')
library(caTools)
set.seed(123)
split = sample.split(temp$Species, SplitRatio = 0.75)
train = subset(temp, split == TRUE)
test = subset(temp, split == FALSE)

nrow(train)
nrow(test)

#1. Decision Trees
dt_classifier = rpart(formula = Species ~ .,data = train)

# Predicting the Test set results
dt_y_pred = predict(dt_classifier, newdata = test, type = 'class')
print(dt_y_pred)

# Making the Confusion Matrix for Decision Tree
cm = table(test$Species, dt_y_pred)
print(cm)

#accuracy of DT model
DTaccu = ((12+9+11)/nrow(test))*100 #true positive nos of 3*3 confusion matrix
```

```
DTaccu

#2. k-Nearest Neighbours
install.packages("class")
library(class)

cl = train$Species
set.seed(1234)
knn_y_pred = knn(train[,1:4],test[,1:4],cl,k=5)

# cm of k-Nearest Neighbours
cm = table(test$Species, knn_y_pred)
print(cm)

#accuracy of KNN model
KNNaccu = ((12+11+11)/nrow(test))*100 #true positive nos of 3*3 confusion matrix
KNNaccu

#3. Support Vector Machine(SVM)
svmclassifier = svm(Species ~ . ,data = train)
svm_y_pred = predict(svmclassifier,newdata = test)

cm = table(test$Species, svm_y_pred)
print(cm)

#accuracy of SVM model
SVMaccu = ((12+11+11)/nrow(test))*100 #true positive nos of 3*3 confusion matrix
SVMaccu

#Decision Tree vs kNN
which(dt_y_pred != knn_y_pred)

#Decision Tree vs SVM
which(dt_y_pred != svm_y_pred)

#svm vs kNN
which(svm_y_pred != knn_y_pred) #both are equal

#Comparison of the accuracy of different models on testing dataset.
models = data.frame(Technique = c("Decision Tree","kNN","SVM"),Accuracy_Percentage =
c(88.88889,94.44444,94.44444))
models
```

Output:

```
> # Making the Confusion Matrix for Decision Tree
> cm = table(test$Species, dt_y_pred)
> print(cm)
            dt_y_pred
             setosa versicolor virginica
  setosa         12          0         0
  versicolor      0          9         3
  virginica       0          1        11
>
> #accuracy of DT model
> DTaccu = ((12+9+11)/nrow(test))*100 #true positive nos of 3*3 confusion matrix
> DTaccu
[1] 88.88889
> # cm of k-Nearest Neighbours
> cm = table(test$Species, knn_y_pred)
> print(cm)
            knn_y_pred
             setosa versicolor virginica
  setosa         12          0         0
  versicolor      0         11         1
  virginica       0          1        11
>
> #accuracy of KNN model
> KNNaccu = ((12+11+11)/nrow(test))*100 #true positive nos of 3*3 confusion matrix
> KNNaccu
[1] 94.44444
> cm = table(test$Species, svm_y_pred)
> print(cm)
            svm_y_pred
             setosa versicolor virginica
  setosa         12          0         0
  versicolor      0         11         1
  virginica       0          1        11
>
> #accuracy of SVM model
> SVMaccu = ((12+11+11)/nrow(test))*100 #true positive nos of 3*3 confusion matrix
> SVMaccu
[1] 94.44444
> #Comparison of the accuracy of different models on testing dataset.
> models = data.frame(Technique = c("Decision Tree","kNN","SVM"),Accuracy_Percentage = c(88.88889,94.44444,94.44444))
> models
     Technique Accuracy_Percentage
1 Decision Tree           88.88889
2          kNN           94.44444
3          SVM           94.44444
>
```

Practical No. 06

Aim: Install, configure and run Hadoop and HDFS and explore HDFS on Windows

Steps to Install Hadoop

1. Install Java JDK 1.8
2. Download Hadoop and extract and place under C drive
3. Set Path in Environment Variables
4. Config files under Hadoop directory
5. Create folder datanode and namenode under data directory
6. Edit HDFS and YARN files
7. Set Java Home environment in Hadoop environment
8. Setup Complete. Test by executing start-all.cmd

There are two ways to install Hadoop, i.e.

9. Single node
10. Multi node

Here, we use multi node cluster.

1. Install Java

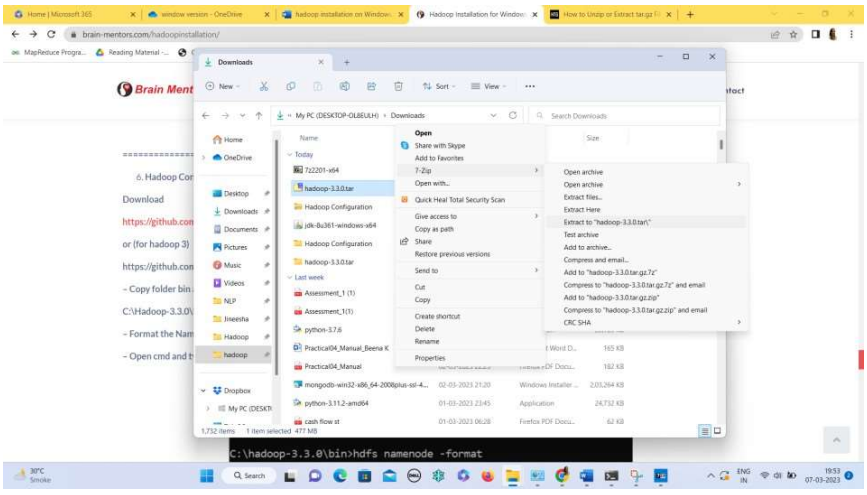
11. – Java JDK Link to download https://www.oracle.com/java/technologies/javase-jdk8-downloads.html
12. – extract and install Java in C:\Java
13. – open cmd and type -> javac -version

```
C:\Users>cd Beena

C:\Users\Beena>java -version
java version "1.8.0_361"
Java(TM) SE Runtime Environment (build 1.8.0_361-b09)
Java HotSpot(TM) 64-Bit Server VM (build 25.361-b09, mixed mode)
```

2. Download Hadoop

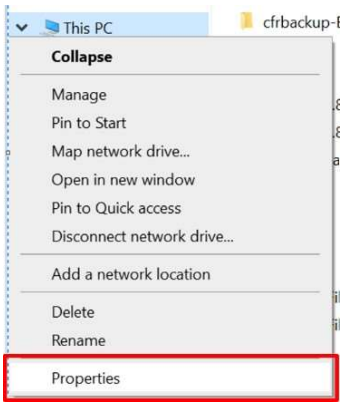
https://www.apache.org/dyn/closer.cgi/hadoop/common/hadoop-3.3.0/hadoop-3.3.0.tar.gz

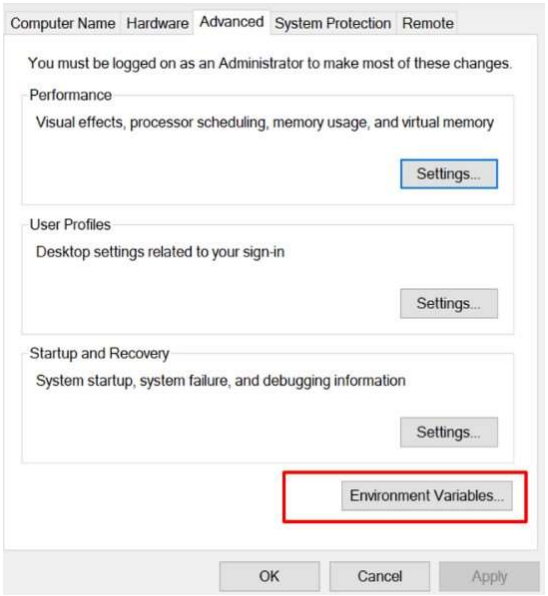
- right click .rar.gz file -> show more options -> 7-zip->and extract to C:\Hadoop-3.3.0\



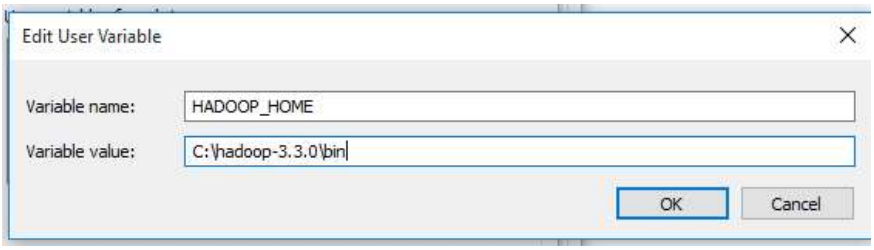
3. **Set the path JAVA_HOME Environment variable**

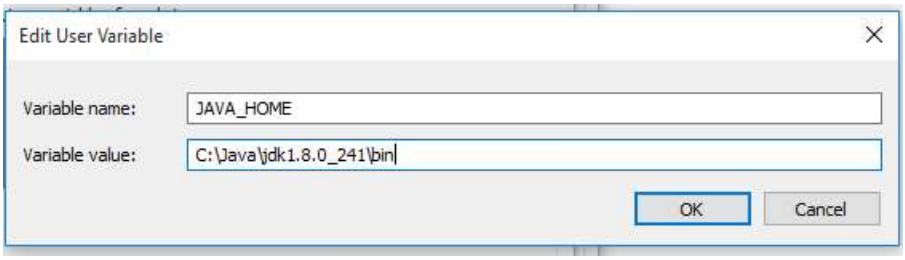
4. **Set the path HADOOP_HOME Environment variable**



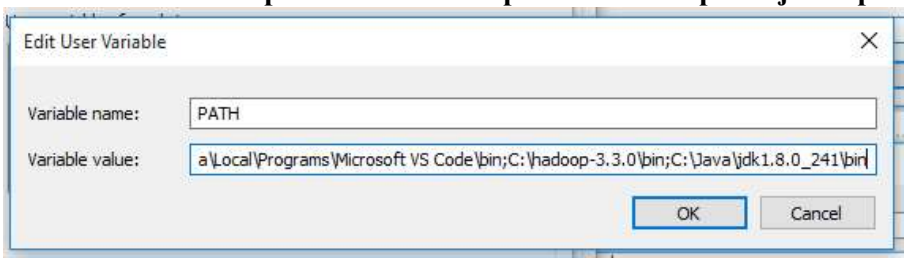


Click on **New to both user variables and system variables.**





Click on user variable -> path -> edit-> add path for Hadoop and java upto 'bin'



Click Ok, Ok, Ok.

5. Configurations

Edit file C:/Hadoop-3.3.0/etc/hadoop/core-site.xml,

paste the xml code in folder and save

==========

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

==========

Rename "mapred-site.xml.template" to "mapred-site.xml" and edit this file C:/Hadoop-3.3.0/etc/hadoop/mapred-site.xml, paste xml code and save this file.

==========

```
<configuration>
  <property>
      <name>mapreduce.framework.name</name>
      <value>yarn</value>
```

```
  </property>
</configuration>
```

==========

Create folder “data” under “C:\Hadoop-3.3.0”

Create folder “datanode” under “C:\Hadoop-3.3.0\data”

Create folder “namenode” under “C:\Hadoop-3.3.0\data”

==========

Edit file C:\Hadoop-3.3.0/etc/hadoop/hdfs-site.xml,

paste xml code and save this file.

```
<configuration>
<property>
      <name>dfs.replication</name>
      <value>1</value>
  </property>

  <property>
      <name>dfs.namenode.name.dir</name>
      <value>/hadoop-3.3.0/data/namenode</value>
  </property>
  <property>
      <name>dfs.datanode.data.dir</name>
      <value>/hadoop-3.3.0/data/datanode</value>
  </property>
 </configuration>
```

==========

Edit file C:/Hadoop-3.3.0/etc/hadoop/yarn-site.xml,

paste xml code and save this file.

```
<configuration>
```

```
  <property>
          <name>yarn.nodemanager.aux-services</name>
          <value>mapreduce_shuffle</value>
  </property>

  <property>
         <name>yarn.nodemanager.auxservices.mapreduce.shuffle.class</name>
          <value>org.apache.hadoop.mapred.ShuffleHandler</value>
  </property>
  <property>
              <name>yarn.resourcemanager.address</name>
              <value>127.0.0.1:8032</value>
  </property>
  <property>
              <name>yarn.resourcemanager.scheduler.address</name>
              <value>127.0.0.1:8030</value>
   </property>
   <property>
              <name>yarn.resourcemanager.resource-tracker.address</name>
              <value>127.0.0.1:8031</value>
    </property>
</configuration>
```

==========

6. Edit file C:/Hadoop-3.3.0/etc/hadoop/hadoop-env.cmd

Find “JAVA_HOME=%JAVA_HOME%” and replace it as

set JAVA_HOME="C:\Java\jdk1.8.0_361"

==========

7. **Download "redistributable" package**

Download and run VC_redist.x64.exe

This is a "redistributable" package of the Visual C runtime code for 64-bit applications, from Microsoft. It contains certain shared code that every application written with Visual C expects to have available on the Windows computer it runs on.

8. **Hadoop Configurations**

Download bin folder from

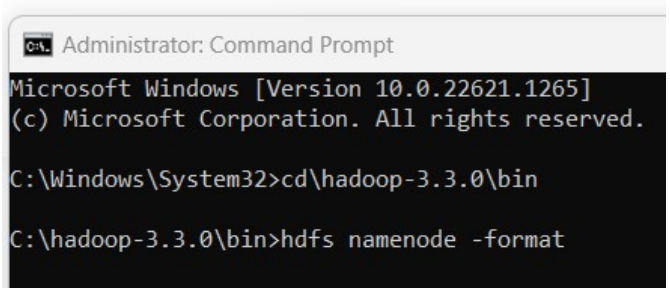
https://github.com/s911415/apache-hadoop-3.1.0-winutils

– Copy the bin folder to c:\hadoop-3.3.0. Replace the existing bin folder.

9. **copy "hadoop-yarn-server-timelineservice-3.0.3.jar" from ~\hadoop-3.0.3\share\hadoop\yarn\timelineservice to ~\hadoop-3.0.3\share\hadoop\yarn folder.**

10. **Format the NameNode**

– Open cmd 'Run as Administrator' and type command "hdfs namenode –format"




```
2023-03-07 21:31:34,685 INFO namenode.FSImageFormatProtobuf: Saving image file C:\hadoop-3.3.0\data\namenode\current\fsi
mage.ckpt_0000000000000000000 using no compression
2023-03-07 21:31:34,844 INFO namenode.FSImageFormatProtobuf: Image file C:\hadoop-3.3.0\data\namenode\current\fsimage.ck
pt_0000000000000000000 of size 400 bytes saved in 0 seconds .
2023-03-07 21:31:34,860 INFO namenode.NNStorageRetentionManager: Going to retain 1 images with txid >= 0
2023-03-07 21:31:34,869 INFO namenode.FSImage: FSImageSaver clean checkpoint: txid=0 when meet shutdown.
2023-03-07 21:31:34,870 INFO namenode.NameNode: SHUTDOWN_MSG:
/************************************************************
SHUTDOWN_MSG: Shutting down NameNode at DESKTOP-OL8EULH/192.168.1.19
************************************************************/
```

11. Testing

– Open cmd 'Run as Administrator' and change directory to C:\Hadoop-3.3.0\sbin

– type start-all.cmd

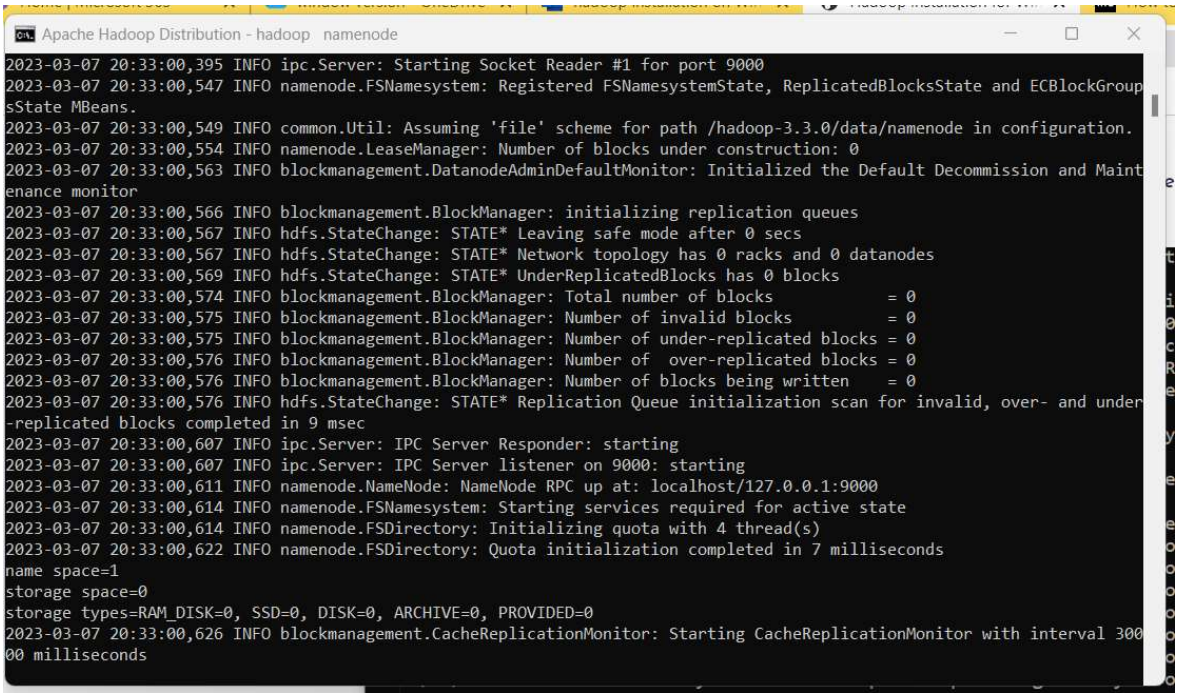
OR

- type start-dfs.cmd

– type start-yarn.cmd

```
C:\hadoop-3.3.0\sbin>start-all.cmd
This script is Deprecated. Instead use start-dfs.cmd and start-yarn.cmd
The filename, directory name, or volume label syntax is incorrect.
The filename, directory name, or volume label syntax is incorrect.
starting yarn daemons
The filename, directory name, or volume label syntax is incorrect.
```

– You will get 4 more running threads for Datanode, namenode, resouce manager and node manager

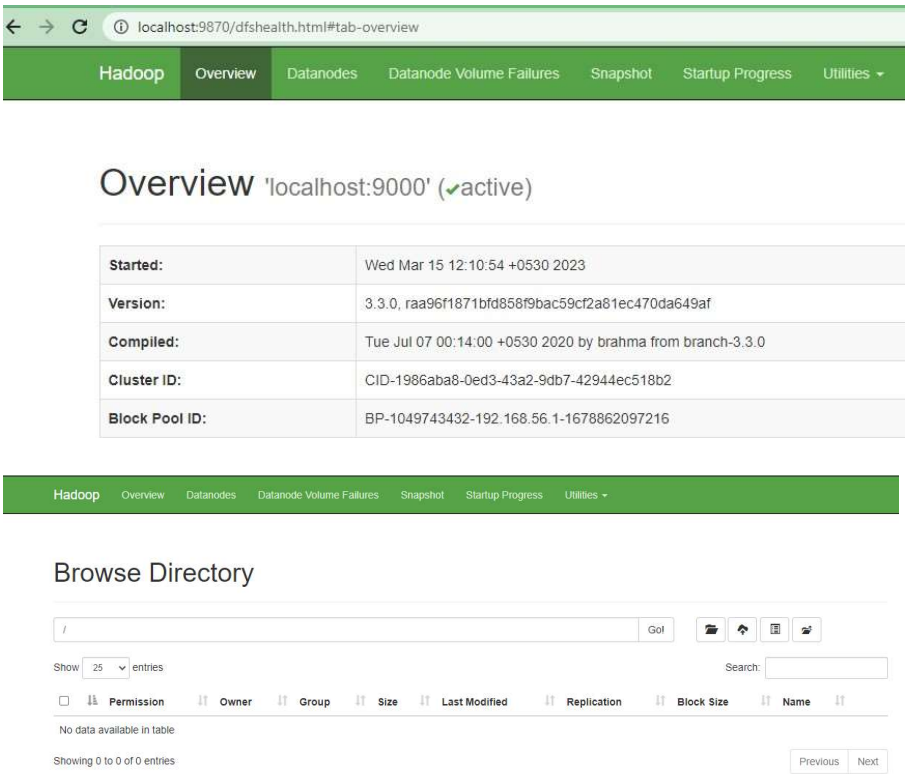


Output:

12. Type JPS command to start-all.cmd command prompt, you will get following output.

```
C:\hadoop-3.3.0\sbin>jps
5632 Jps
7572 DataNode
3752 ResourceManager
7992 NameNode
8028 NodeManager
```

13. Run http://localhost:9870/ from any browser



Practical No. 07

Aim: Implement an application that stores big data in Hbase / MongoDB and manipulate it using R / Python

Requirements

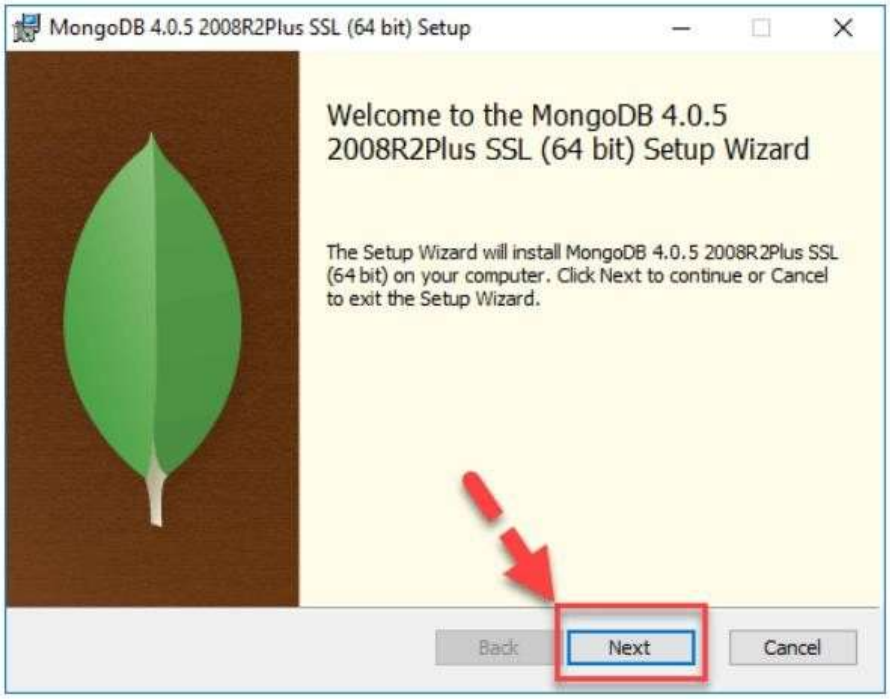
a. PyMongo

b. Mongo Database

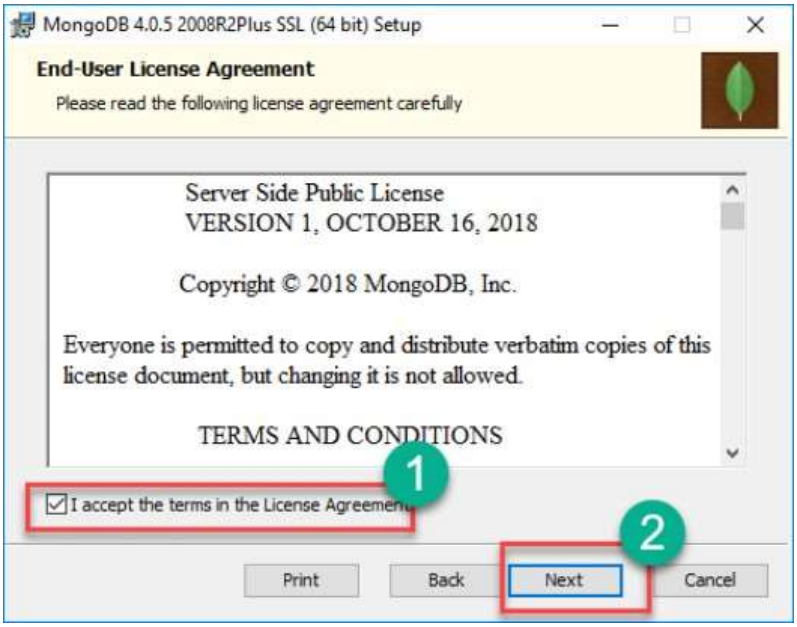
Step A: Install Mongo database

Step 1) Go to (https://www.mongodb.com/download-center/community) and Download MongoDB Community Server. We will install the 64-bit version for Windows.

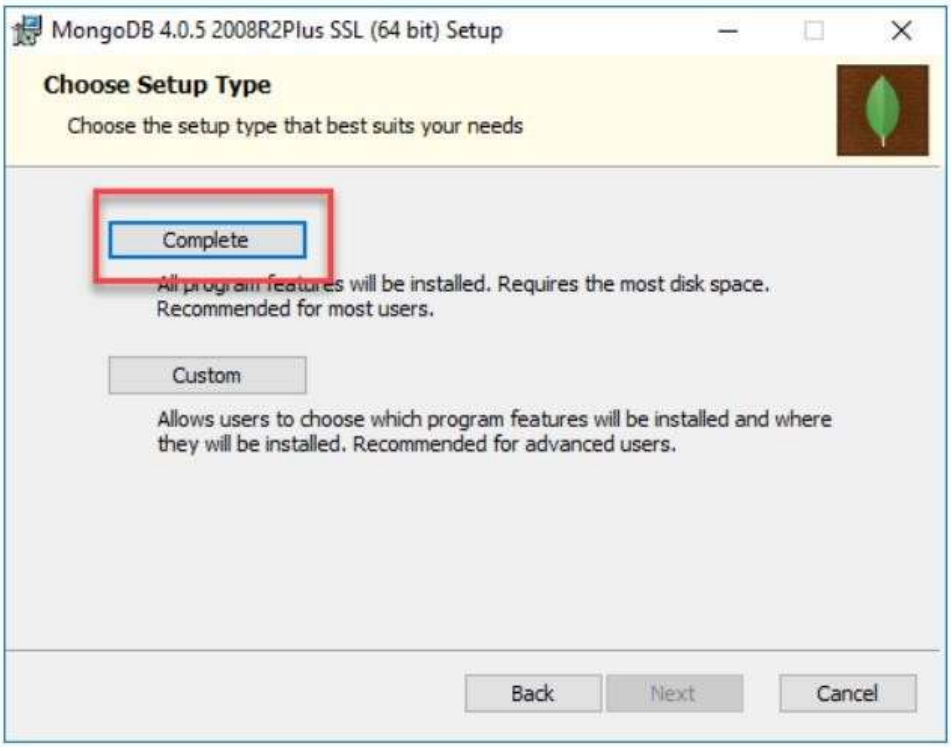
Step 2) Once download is complete open the msi file. Click Next in the start up screen



Step 3)
1. Accept the End-User License Agreement
2. Click Next

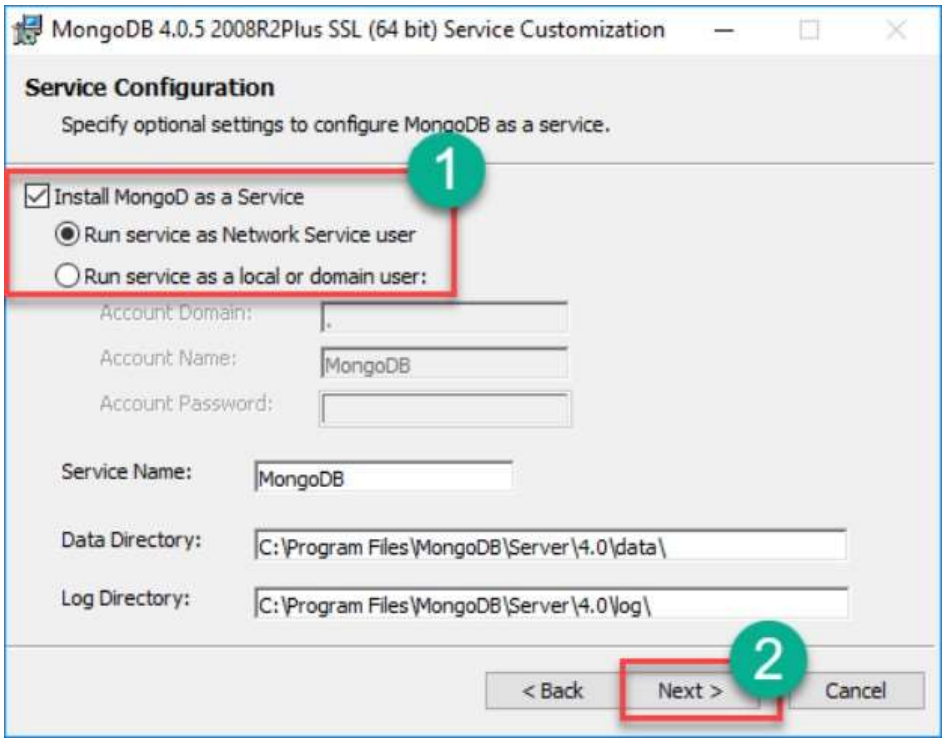


Step 4) Click on the "complete" button to install all of the components. The custom option can be used to install selective components or if you want to change the location of the installation.

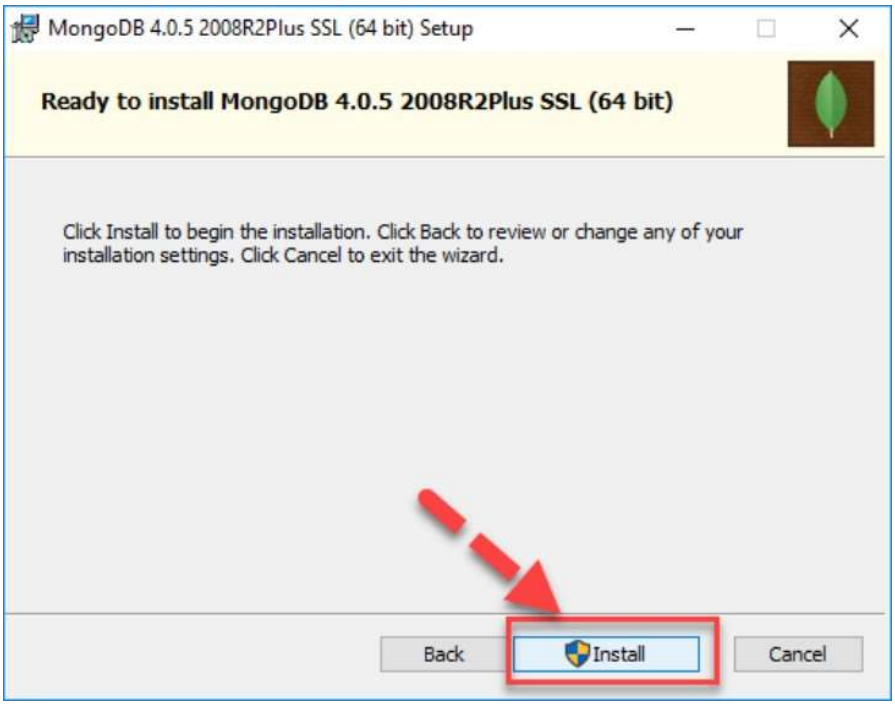


Step 5)
1. Select “Run service as Network Service user”. make a note of the data directory, we”ll need this later.

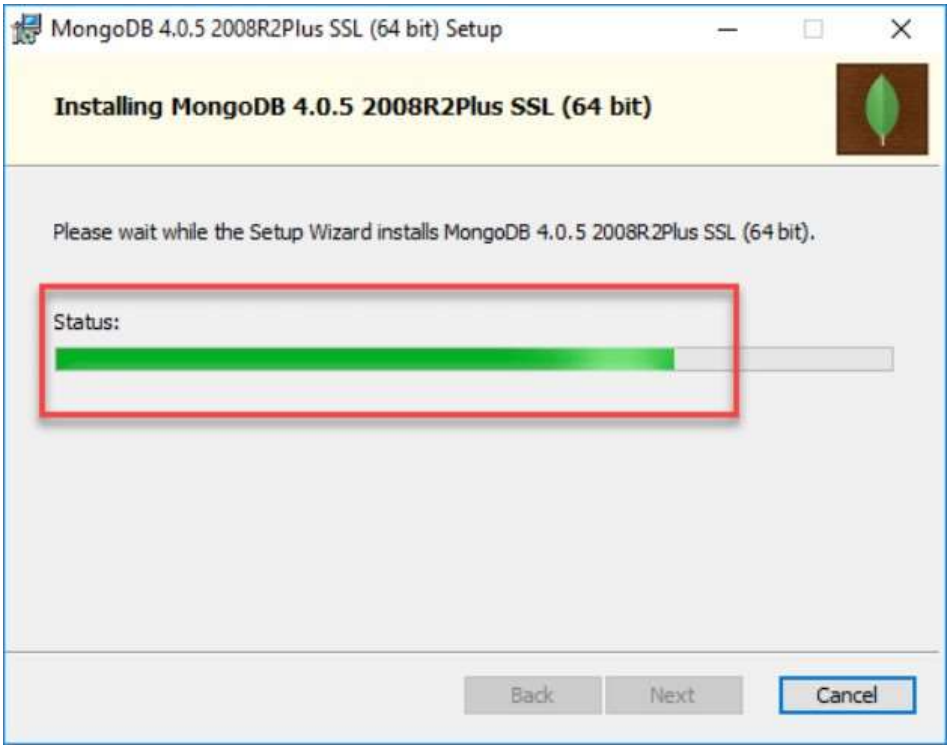
2. Click Next



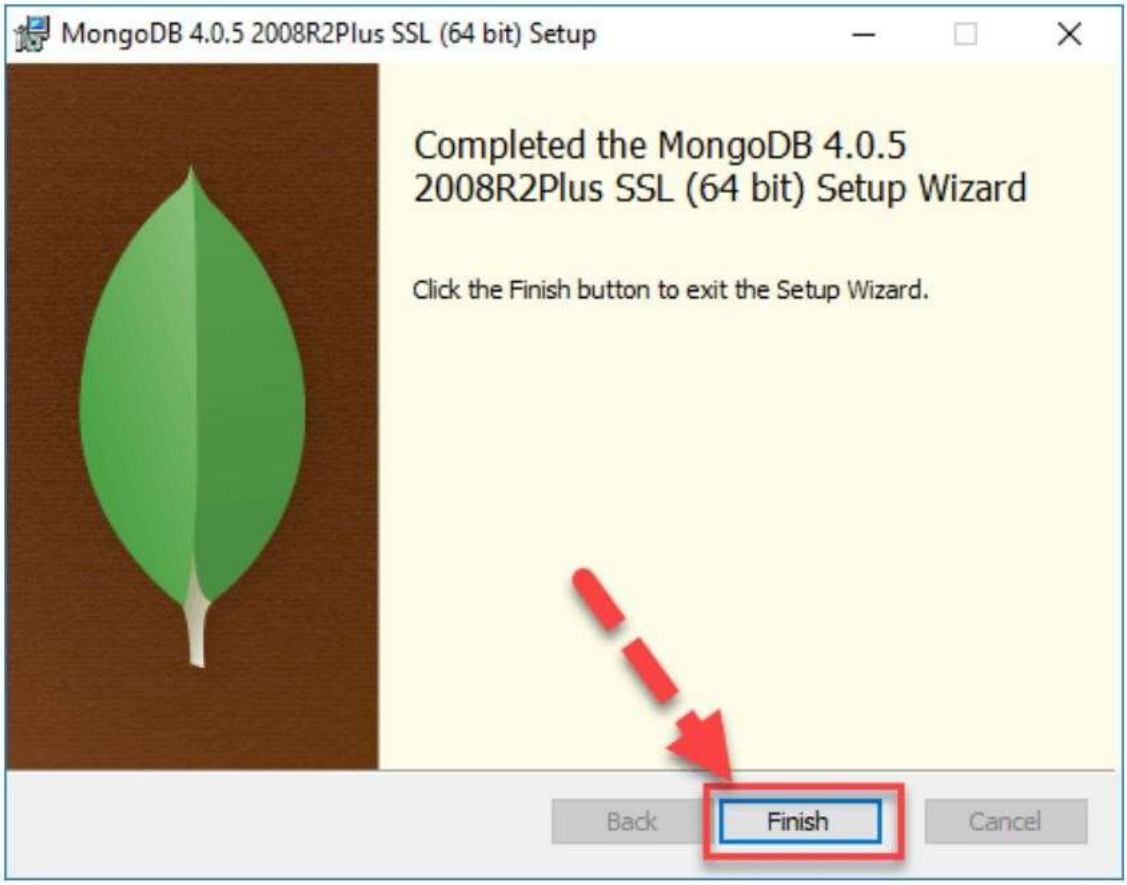
Step 6) Click on the Install button to start the installation.



Step 7) Installation begins. Click Next once completed.



Step 8) Click on the Finish button to complete the installation.



Test Mongodb

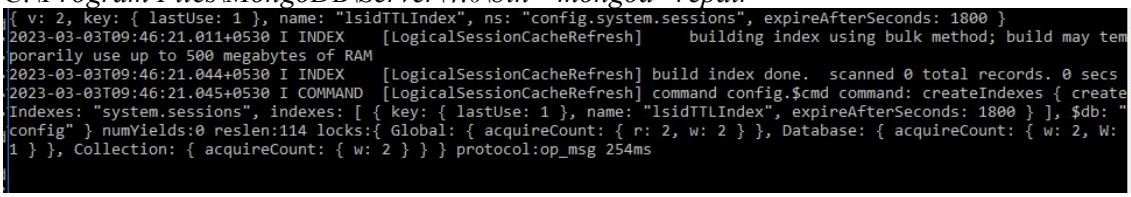
Step 1) Go to " C:\Program Files\MongoDB\Server\4.0\bin" and double click on **mongo.exe.** Alternatively, you can also click on the MongoDB desktop icon.

- **Create the directory where MongoDB will store its files.**
  Open command prompt window and apply following commands

C:\users\admin> cd\
C:\>md data\db

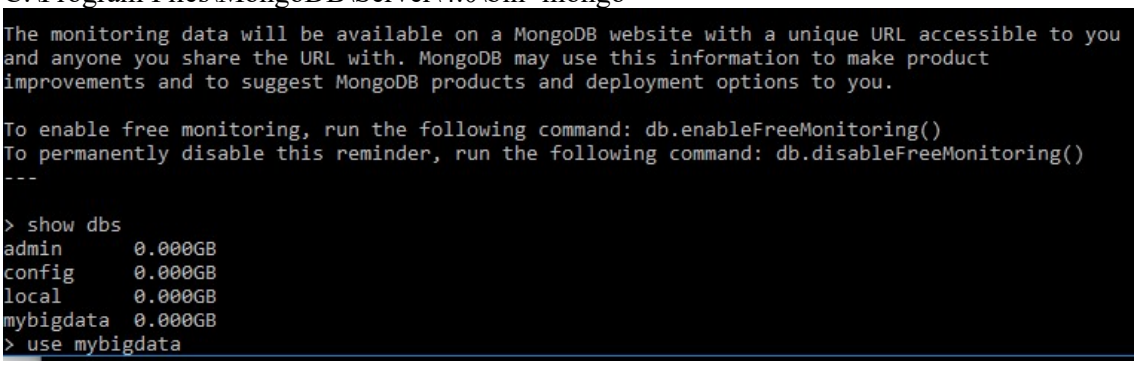
Step 2) Execute mongodb

Open another command prompt window.
C:\> cd C:\Program Files\MongoDB\Server\4.0\bin
C:\Program Files\MongoDB\Server\4.0\bin> mongod
In case if it gives an error then run the following command:
C:\Program Files\MongoDB\Server\4.0\bin> mongod –repair



Step 3) Connect to MongoDB using the Mongo shell

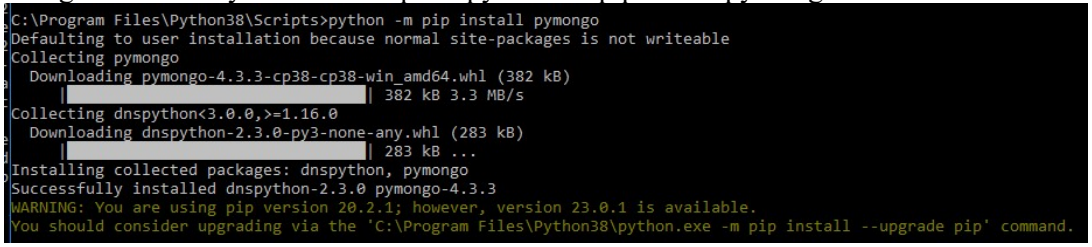
Let the MongoDB daemon to run.
Open another command prompt window and run the following commands:
C:\users\admin> cd C:\Program Files\MongoDB\Server\4.0\bin
C:\Program Files\MongoDB\Server\4.0\bin>mongo



Step 4) Install PyMongo

Open another command prompt window and run the following commands:
Check the python version on your desktop / laptop and copy that path from window explorer

C:\users\admin>cd C:\Program Files\Python311\Scripts
C:\Program Files\<Python38>\Scripts > python -m pip install pymongo



Note: # **-m** option is for <module-name>
Now you have downloaded and installed a mongoDB driver.

Step 5) Test PyMongo
Run the following command from python command prompt

import pymongo

Now, either create a file in Python IDLE or run all commands one by one in sequence on Python cell

Program 1: Creating a Database: create_dp.py

```
import pymongo
myclient = pymongo.MongoClient("mongodb://localhost:27017/")
mydb = myclient["mybigdata"]
print(myclient.list_database_names())
```

```
['admin', 'config', 'local']
```

Progam 2: Creating a Collection: create_collection.py

```
import pymongo
myclient = pymongo.MongoClient("mongodb://localhost:27017/")
mydb = myclient["mybigdata"]
mycol=mydb["student"]
print(mydb.list_collection_names())
```

```
[]
```

Progam 3: Insert into Collection: insert_into_collection.py

```
import pymongo
myclient = pymongo.MongoClient("mongodb://localhost:27017/")
mydb = myclient["mybigdata"]
mycol=mydb["student"]
mydict={"name":"Beena", "address":"Mumbai"}
x=mycol.insert_one(mydict) # insert_one(containing the name(s) and value(s) of each field
```

Program 4: Insert Multiple data into Collection: insert_many.py

```
import pymongo
myclient = pymongo.MongoClient("mongodb://localhost:27017/")
mydb = myclient["mybigdata"]
mycol=mydb["student"]
mylist=[{"name":"Khyati", "address":"Mumbai"}, {"name":"Kruti", "address":"Mumbai"},
{"name":"Nidhi", "address":"Pune"}, {"name":"Komal", "address":"Pune"},]
x=mycol.insert_many(mylist)
```

Step 6) Test in Mongodb to check database and data inserted in collection
a. If you want to check your database list, use the command show dbs in mongo command prompt

> show dbs

```
admin      0.000GB
config     0.000GB
local      0.000GB
mybigdata  0.000GB
```

b. If you want to use a database with name mybigdata, then use database statement would be as follow:

> use mybigdata

```
switched to db mybigdata
```

c. If you want to check collection in mongodb use the command show collections
> show collections

```
student
```

d. If you want to display the first row from collection: db.collection_name.find()
> db.student.findOne()

```
> db.student.findOne()
{
        "_id" : ObjectId("640178face663db608cef72f"),
        "name" : "Beena",
        "address" : "Mumbai"
}
```

e. If you want to display all the data from collection: db.collection_name.find()
> db.student.find()

```
> db.student.find()
{ "_id" : ObjectId("640178face663db608cef72f"), "name" : "Beena", "address" : "Mumbai" }
{ "_id" : ObjectId("640179336ce317082c266dc1"), "name" : "Khyati", "address" : "Mumbai" }
{ "_id" : ObjectId("640179336ce317082c266dc2"), "name" : "Kruti", "address" : "Mumbai" }
{ "_id" : ObjectId("640179336ce317082c266dc3"), "name" : "Nidhi", "address" : "Pune" }
{ "_id" : ObjectId("640179336ce317082c266dc4"), "name" : "Komal", "address" : "Pune" }
```

f. count number of rows in a collection
> db.student.count()

```
5
```

Site for R packages documentation:
https://cran.r-project.org/web/packages/available_packages_by_name.html