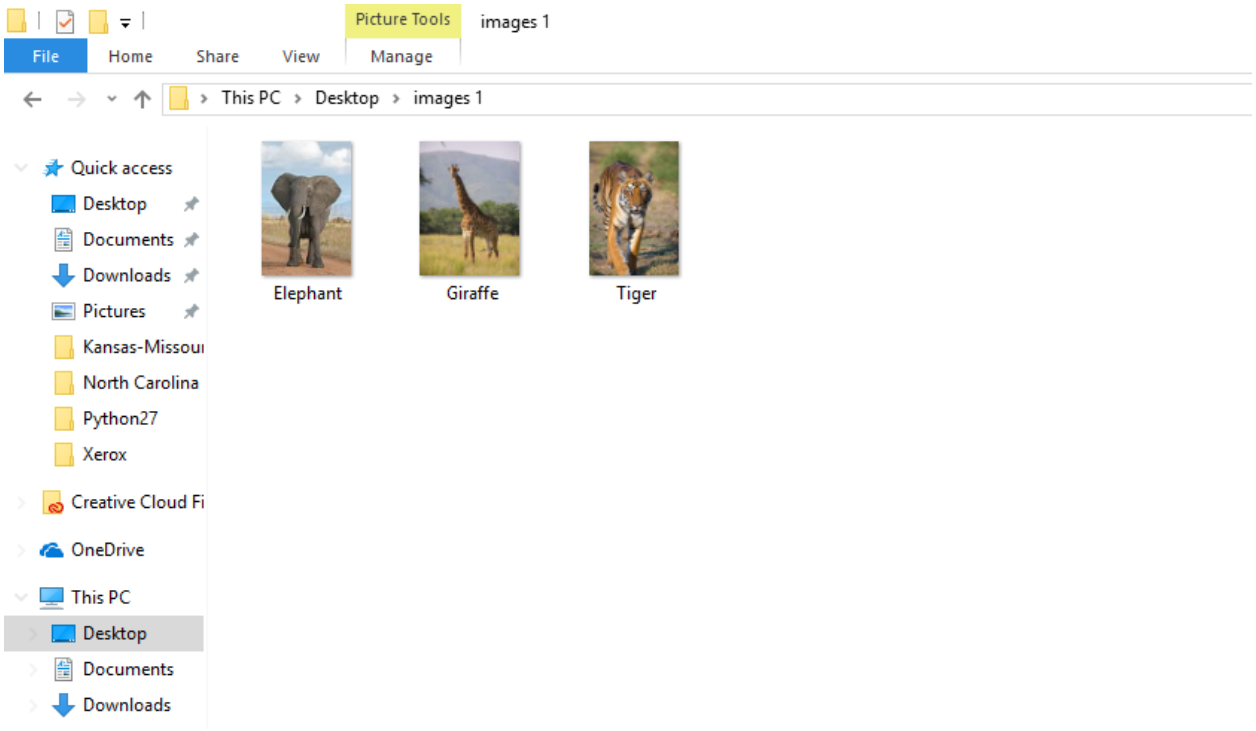
Lab Assignment 6

Task 1:

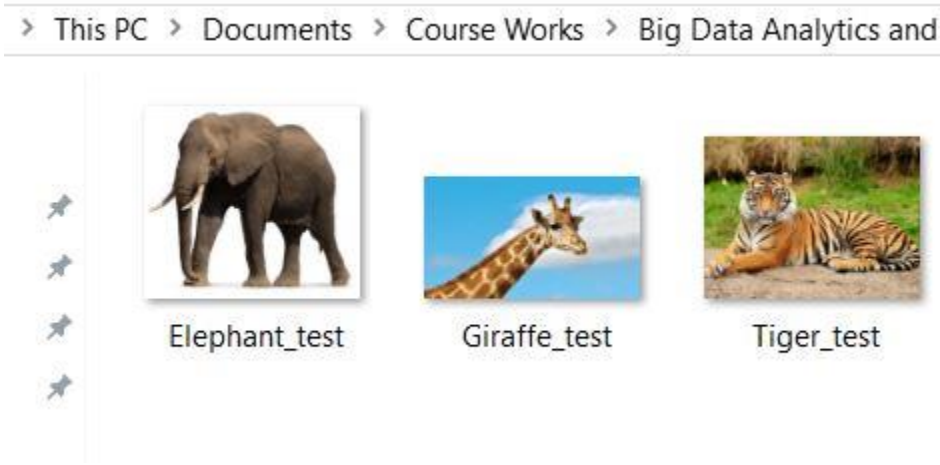
Write a spark program for the following Machine Learning Task. Create your own dataset for Image Classification/Object Detection Problem. Handle fuzzy classification/object detection task using at least two classification algorithms (e.g., Decision Tree, Random Forest, Naïve Bayes). Report the accuracy and confusion matrix obtained.

- I have taken animals images and trained the model.
- Training images contains four classes 'elephant','tiger' and 'giraffe'.
- Image classification involves training of images by giving the output labels and based on the training models, we can validate with test data.
- Following images indicates the training and test images.

Training data

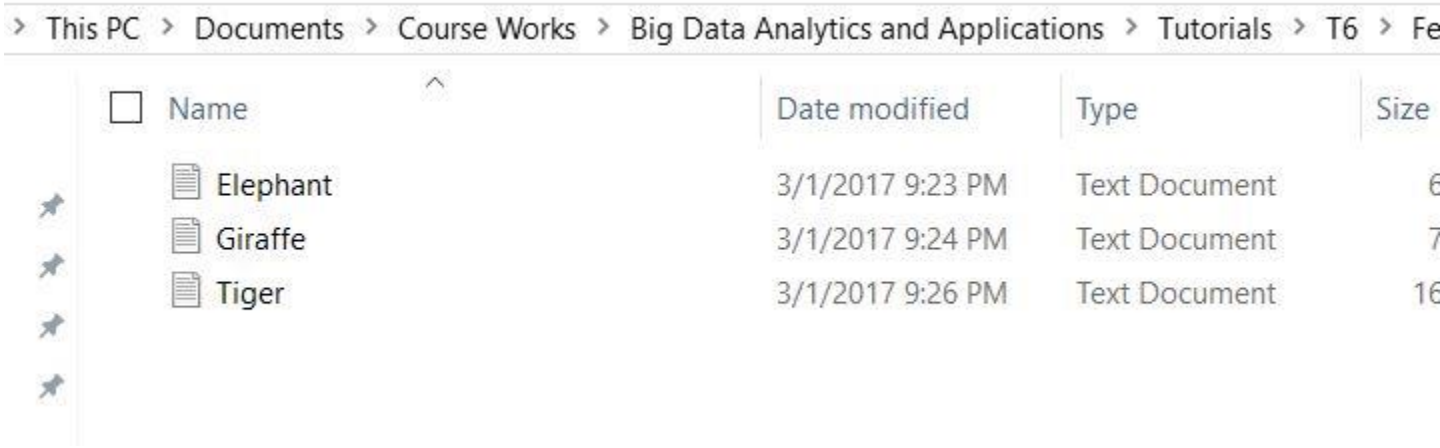


Test data

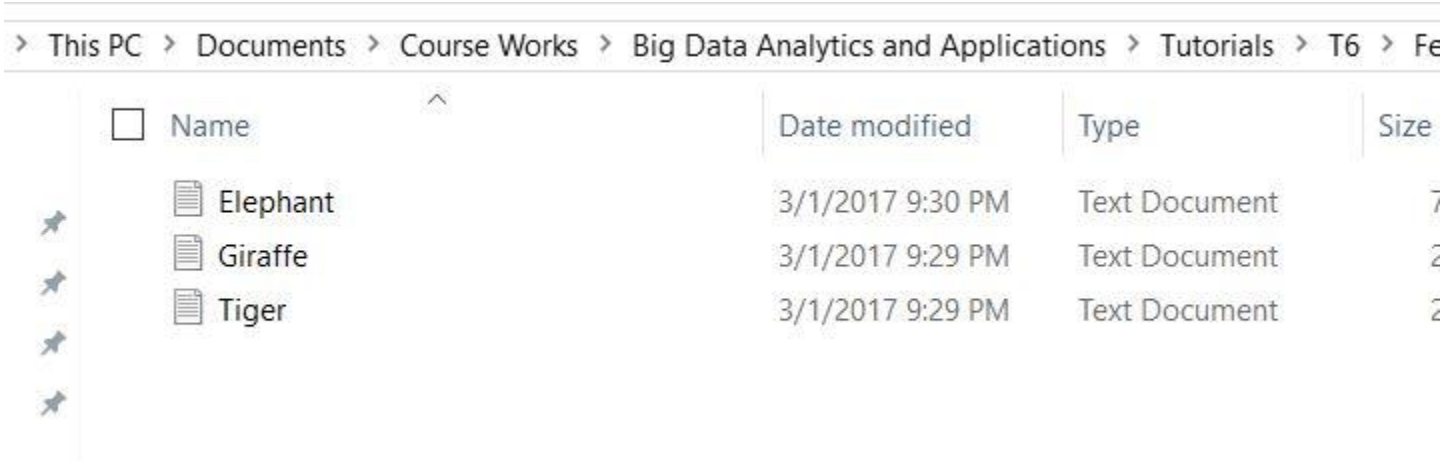


- By using Feature Extraction code, I have extracted the features for both the test and train images. Following images correspond to the features generated for both the train and test images.

Features Generated for Training data



Features Generated for Test data



- Three image categories are taken in the source code. They are "elephant","giraffe","tiger".

Image Categories

```
object ImageClassification_DT {
  def main(args: Array[String]) {
    val IMAGE_CATEGORIES = Array("Tiger", "Giraffe", "Elephant")
```

- Following images describe the features on video and object detection.

Image features and Object Detection

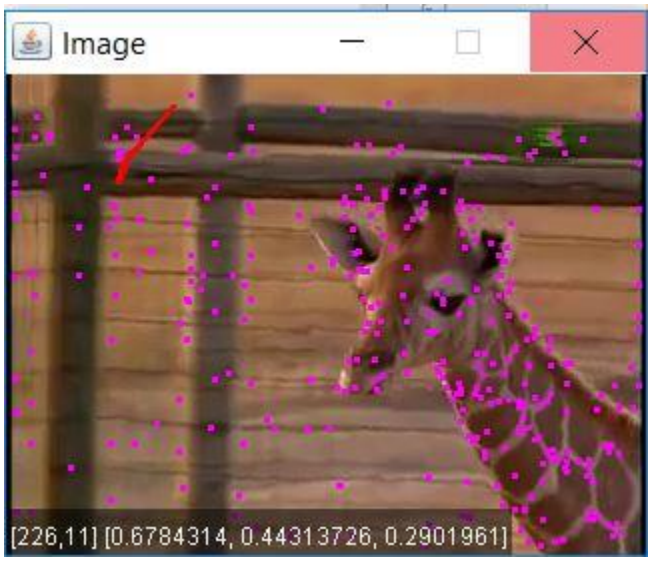


Image features and Object Detection

- I have used both Decision Tree and Random Forest models to test the accuracy of the model. Following images correspond to the accuracy and confusion matrix for both Decision Tree model and Random Forest Model.

Accuracy and Confusion Matrix for Decision Forest Model

```
Decision Tree Model
**************************************************************
Accuracy:0.3333333333333333
Confusion Matrix:
1.0  0.0  0.0
1.0  0.0  0.0
1.0  0.0  0.0
**************************************************************
```

- Following image corresponds to accuracy and confusion matrix for Random Forest Model.

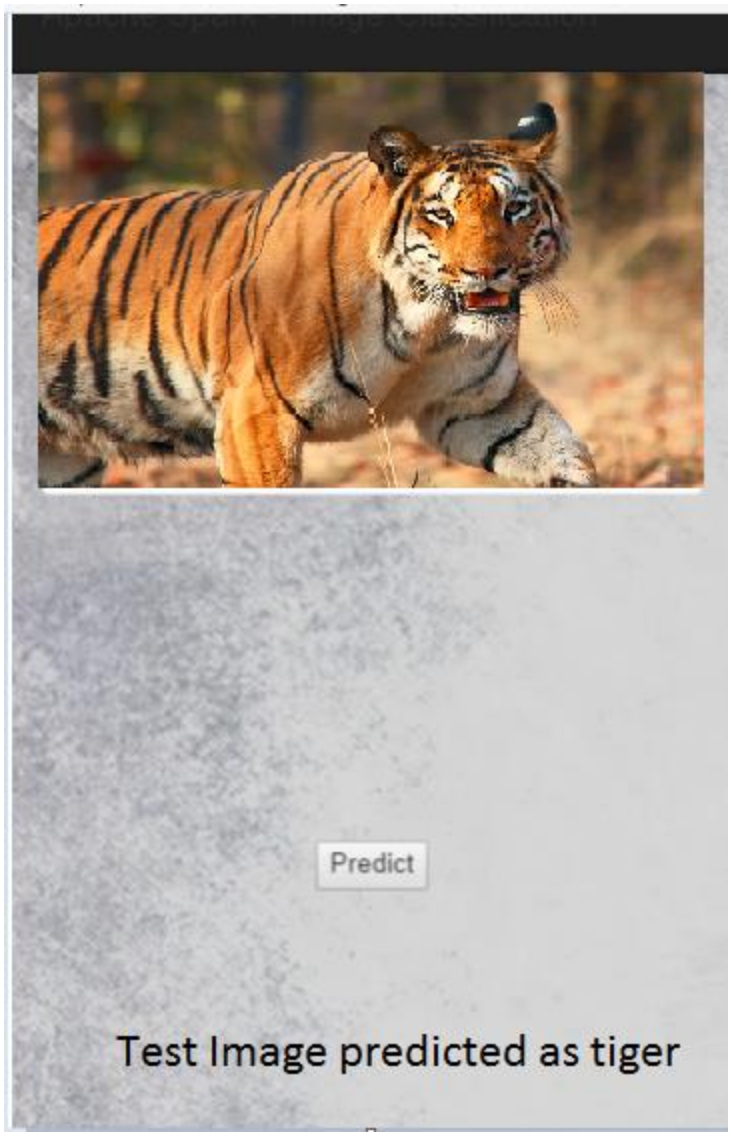
Accuracy and Confusion Matrix for Random Forest Model

```
Random Forest Model
************************************************************
Accuracy:0.3333333333333333
Confusion Matrix:
1.0  0.0  0.0
1.0  0.0  0.0
1.0  0.0  0.0
************************************************************
```

Task 2:

- Following images represent the mobile application for Spark API.

Mobile app for spark


Predict
Test Image predicted as tiger

Installed application on Emulator

Application Home page

11:02
Demo_Clarify
Check
RT
PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

- Following image display the results from clarifai api for the given image.

Results from Clarifai api