CS5542 : Lab Assignment #4

Due on Wednesday, February 17, 2016

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1: Hadoop MapReduce Algorithm

Question:

Implement MapReduce algorithm for finding Facebook common friends problem and run the MapReduce job on Apache Hadoop.Write a report including your algorithm and result screenshots.

Description:

Given that the friends of a person are stored as $A->(B,D,E)$ we can use this to feed the mapper, which will generate intermediate output of key-value pairs with key being friend along with the person. The value containing list of friends of that person.

Ex: Map($A->BDE$)
(AB)->(BDE)
(AD)->(BDE)
(AE)->(BDE)

Map($B->ACDE$)
(AB)->(ACDE)
(BC)->(ACDE)
(BD)->(ACDE)
(BE)->(ACDE)

Grouping them will result as: $(AB)->(BDE)(ACDE)$

Upon giving this to the reducer, which will intersect the values and output the same key. For Ex: $(AB)->(BDE)(ACDE)$ will output $(AB)->(CD)$

The final result will be:
(A B) -> (C D)
(A C) -> (B D)
(A D) -> (B C)
(B C) -> (A D E)
(B D) -> (A C E)
(B E) -> (C D)
(C D) -> (A B E)
(C E) -> (B D)
(D E) -> (B C)

Screenshot:

Figure 1: Hadoop Input

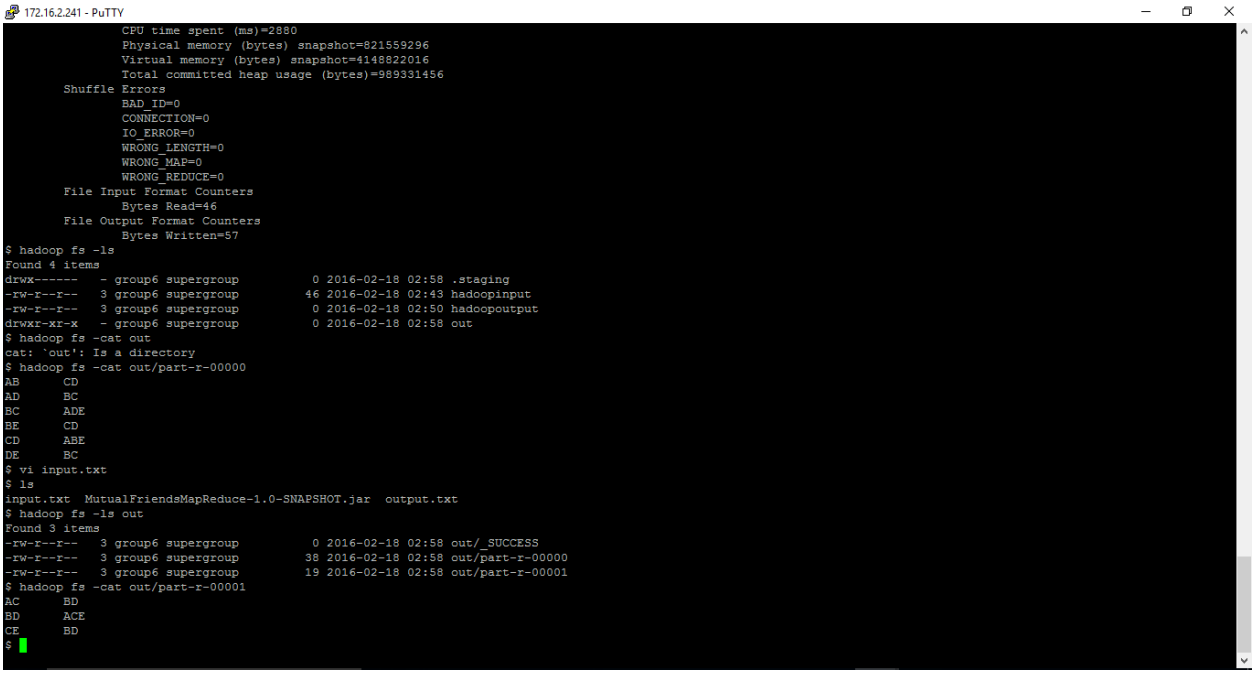

Figure 2: Hadoop Output

2: Watch App

Question:

Implement asmartwatch/smartphone application using existing speech services/image services (e.g., IBM Alchemyapi, Face++) related to your project

Description:

In our project - Tour guide, ROboMe will be taking a series of images to map the interiors of an architecture. This requires image recognition technique. I have used the face detection service provided by the android FACE API. With this Google play service of face detection, the orientation of head and the rotation of head with respect to neck (left facing or right facing) can be detected. It also provides a function call called 'landmarks' which highlights the features identified in the face. To detect the facial statuses below method calls are available.

- getIsLeftEyeOpenProbability() - Returns a value between 0 and 1, giving probability that the left eye is open

- getIsRighteyeOpenProbability() - Returns a value between 0 and 1, giving probability that the right eye is open

- getIsSmilingProbability() - Returns a value between 0 and 1 giving a probability that the face is smiling

Screenshots:

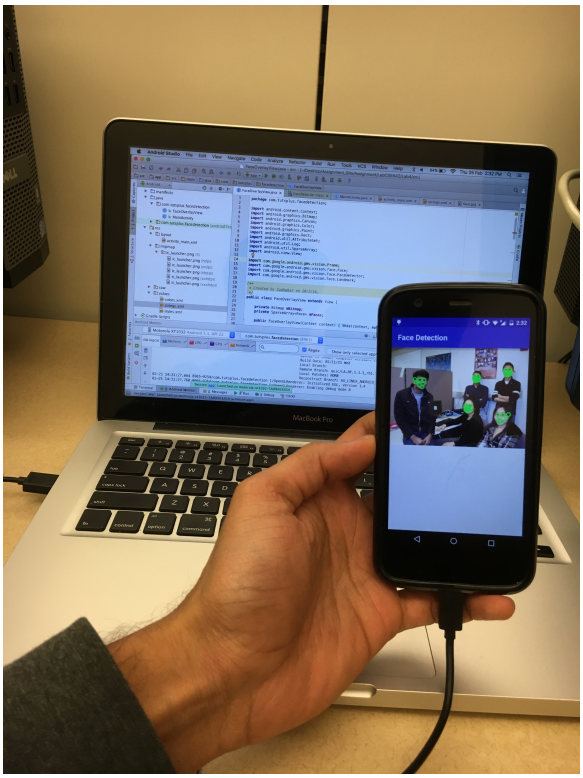

Figure 3: Face detection

Reference:
I have went through the below reference tutorial for using Google Face API. I have not included the same code but made use of the structure mentioned in the link - http://code.tutsplus.com/tutorials/an-introduction-to-face-detection-on-android–cms-25212

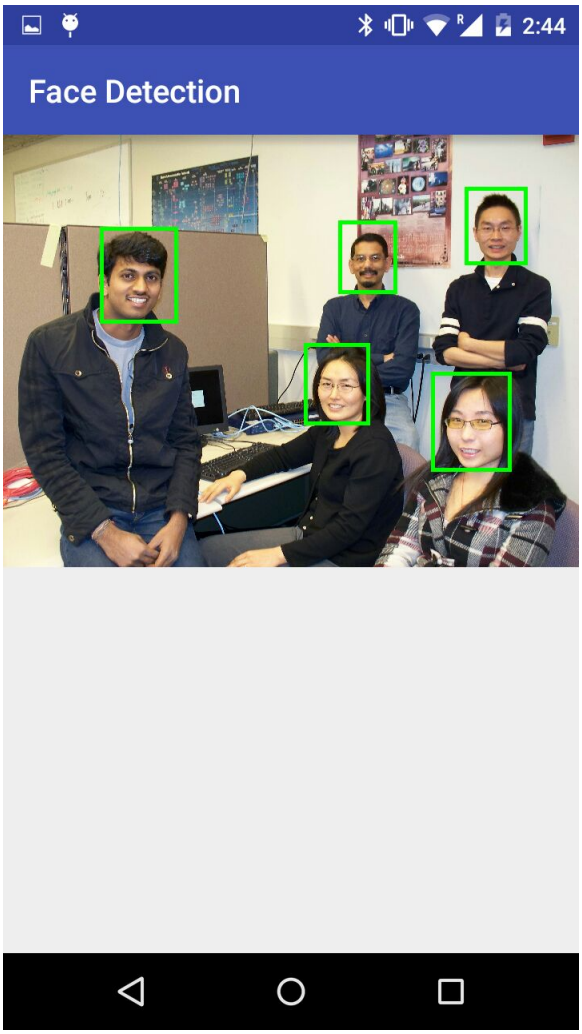

Figure 4: FaceBox

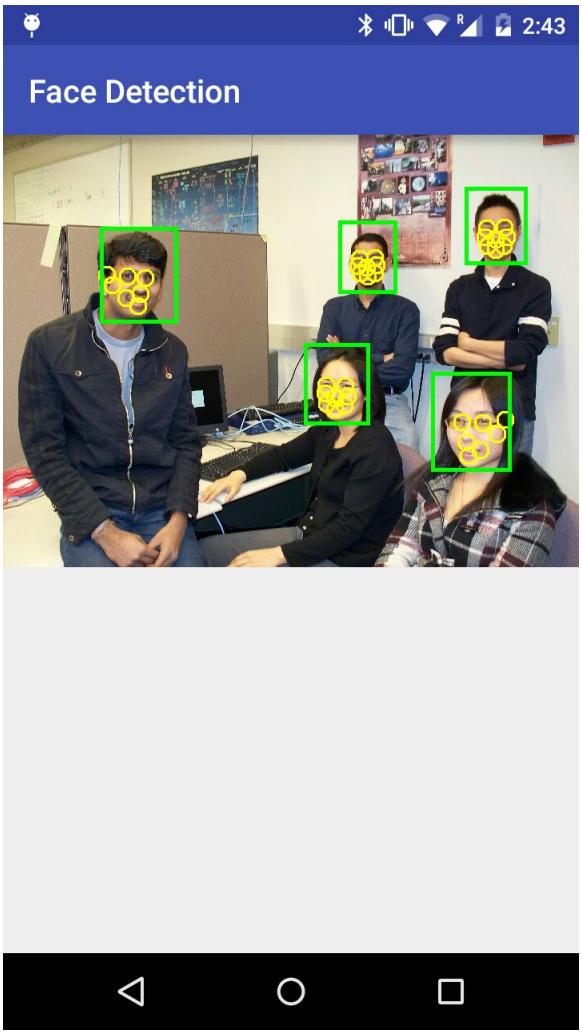

Figure 5: FaceBox with Landmarks