

Android and Mashup Application

Contributors

Team : 4-2

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Objective

Part 1:

1. Design Login Activity and Register Activity using a cloud service for realtime storage like [Firebase](#).
2. Use a Machine Learning API like [IBM Watson](#), [Google Machine Learning](#), [Amazon Web Service](#).
3. Use any one hardware features in smart phone like sensors, maps, connectivity, media etc.

Part 2:

1. Design a [Web Mashup page](#) of two web services.
2. State three unit test cases for the Web Mashup page.
3. Add a [Cordova Plugin](#).
4. Analyze the performance of the page using [YSlow](#)

Design and Screenshots/Code Snapshots

Android App (Part-1)

1. Login Activity and Register Activity using Firebase

We have used [firebase](#) for user authentication where a new user can register a account using a email id and password and an existing user can login using their credentials.

Code Snapshot:

code to login a user using firebase

```
firebaseAuth = FirebaseAuth.getInstance();

firebaseAuth.signInWithEmailAndPassword(login_username_value, login_password_value)
    .addOnCompleteListener( activity: MainActivity.this, (task) → {
    if (task.isSuccessful()) {
        Toast.makeText( context: MainActivity.this, text: "Logged in Successfully",
            Toast.LENGTH_LONG).show();
        finish();

        Intent intent = new Intent( packageContext: MainActivity.this,
            TextScannerActivity.class);
        startActivity(intent);
    } else {
        Toast.makeText( context: MainActivity.this,
            text: "Invalid Username or Password", Toast.LENGTH_LONG).show();
    }
});
```






code to register a user using firebase

```
firebaseAuth = FirebaseAuth.getInstance();

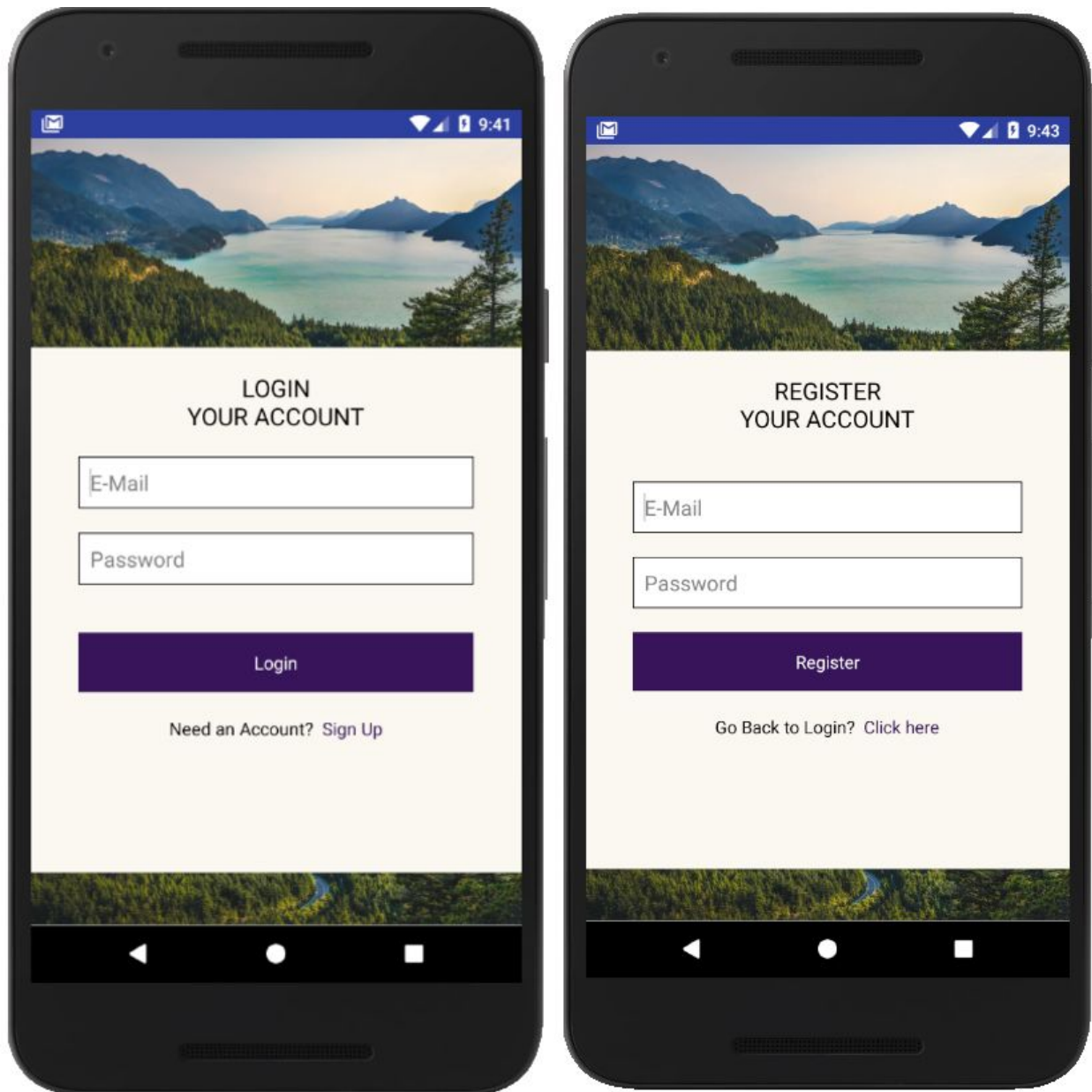
firebaseAuth.createUserWithEmailAndPassword(register_username_value,
    register_password_value).addOnCompleteListener
    ( activity: RegisterActivity.this, (task) → {
    if (task.isSuccessful()) {
        Toast.makeText( context: RegisterActivity.this,
            text: "User Registration Successfully", Toast.LENGTH_LONG).show();
        finish();

        Intent intent = new Intent( packageContext: RegisterActivity.this,
            MainActivity.class);
        startActivity(intent);
    }
    else{
        Toast.makeText( context: RegisterActivity.this, text: "Email Id exists",
            Toast.LENGTH_LONG).show();
    }
});
```

Firestore user authentication:

 Search by email address, phone number, or user UID			
Identifier	Providers	Created	Signed In
rahul@gmail.com		Oct 12, 2018	Oct 12, 2018
kumar@gmail.com		Oct 12, 2018	Oct 12, 2018
kavin@gmail.com		Oct 12, 2018	Oct 12, 2018
as@as.com		Oct 12, 2018	Oct 12, 2018

Screenshots from the app:



2. Using a Machine Learning API from the [list](#)

We have used [Google Cloud Vision Text Recognizer](#). It is a machine learning algorithm to detect text shown in the camera.

Code Snapshot:

```

textRecognizer.setProcessor(new Detector.Processor<TextBlock>() {
    @Override
    public void release() {
    }
    @Override
    public void receiveDetections(Detector.Detections<TextBlock> detections) {

        final SparseArray<TextBlock> items = detections.getDetectedItems();
        if(items.size() != 0)
        {
            textView.post(new Runnable() {
                @Override
                public void run() {
                    StringBuilder stringBuilder = new StringBuilder();
                    for(int i =0;i<items.size();++i)
                    {
                        TextBlock item = items.valueAt(i);
                        stringBuilder.append(item.getValue());
                        stringBuilder.append("\n");
                    }
                    textView.setText(stringBuilder.toString());
                }
            });
        }
    }
});

```

Screenshots from the app:

It's not a faith in technology. It's
faith in people.

Steve Jobs

It's not a faith in technology. It's

3. Add a Hardware Feature:

We have added camera to get the text shown in them.

Code Snapshot:

```
cameraSource = new CameraSource.Builder(getApplicationContext(), textRecognizer)
    .setFacing(CameraSource.CAMERA_FACING_BACK)
    .setRequestedPreviewSize(1280, 1024)
    .setRequestedFps(2.0f)
    .setAutoFocusEnabled(true)
    .build();
cameraView.getHolder().addCallback(new SurfaceHolder.Callback() {
    @Override
    public void surfaceCreated(SurfaceHolder surfaceHolder) {

        try {
            if (ActivityCompat.checkSelfPermission(getApplicationContext(),
                android.Manifest.permission.CAMERA) !=
                PackageManager.PERMISSION_GRANTED) {

                ActivityCompat.requestPermissions(activity: TextScannerActivity.this,
                    new String[]{android.Manifest.permission.CAMERA},
                    RequestCameraPermissionID);

                return;
            }
            cameraSource.start(cameraView.getHolder());
        } catch (IOException e) {
            e.printStackTrace();
        }
    }
})
```

Mashup App (IONIC) (Part-2)

1. Youtube Video Player (using youtube API and youtube cordova plugin)

Approach:-

Here, we have used youtube API (<https://www.googleapis.com/youtube/v3/search>) and youtubevideoplayer cordova plugin-in to play some random videos on youtube.

Code Explanation:-

Below is the html file for video search application. On click function is called, when we click on the particular video as `play(result.id.videoId)`.

```
1 <ion-header>
2   <ion-navbar color="danger">
3     <button ion-button menuToggle>
4       <ion-icon name="menu"></ion-icon>
5     </button>
6     <ion-title>
7       <ion-icon name="logo-youtube"></ion-icon>
8       Video search</ion-title>
9     </ion-navbar>
10  </ion-header>
11
12  <ion-content padding class="video-content">
13    <ion-item>
14      <ion-input type="text" placeholder="Search Youtube..." [(ngModel)]="searchTerm"></ion-input>
15    </ion-item>
16    <button ion-button full icon-left color="danger" (click)="search()">
17      <div padding><ion-icon name="search" ></ion-icon></div>
18      Search
19    </button>
20
21    <ion-card *ngFor="let result of results">
22      <ion-card-content>
23        
25          <h2><strong>Description :</strong> {{result.snippet.title}}</h2>
26          <h3><strong>Channel Name :</strong> {{result.snippet.channelTitle}}</h3>
27          <h4><strong>Published On :</strong>{{result.snippet.publishedAt}}</h4>
28        </div>
29      </ion-card-content>
30    </ion-card>
31  </ion-content>
```

Here , we have imported `youtubevideoplayer` module in `videosearch.ts` and called the youtube API for getting the result.


```

constructor(public navCtrl: NavController,
  public http: HttpClient, private youtube: YoutubeVideoPlayer) {
}

ionViewDidLoad() {
  console.log('ionViewDidLoad VideosearchPage');
}

search() {
  let params = new HttpParams();
  params =params.append('maxResults',"25");
  params =params.append('part', "snippet");
  params =params.append('q', this.searchTerm);
  params =params.append('key', "AIzaSyBZ3yV5xBi2yDA2yPVwaH_we8ECSZI_2Lc");

  //Http request-
  return this.http.get("https://www.googleapis.com/youtube/v3/search", {params: params}).subscribe(
    (response) => this.results=response["items"],
    (error) =>console.log(JSON.stringify(error));
  )
}

play(vidId){
  this.youtube.openVideo(vidId);
}

```

Screenshots:-

Below is the Video player home page



Video search

Search Youtube...



SEARCH

Output page, when we search for "Cristiano Ronaldo"



Video search

Cristiano ronaldo



SEARCH



Description : When Cristiano Ronaldo Doesn't Use Speed to Humiliate His Opponent

Channel Name : Ronnie7M

Published On : 2018-10-11T16:15:00.000Z



Output Page, when we search for "UMKC"



Video search

Umkc



SEARCH

Description : UMKC

Channel Name : UMKC

Published On : 2006-08-06T17:17:25.000Z



Description : UMKC Campus Housing

Channel Name : UMKC

Published On : 2011-05-19T17:11:59.000Z

2. Facedetection App using Machine Learning (IONIC):-

Approach:-

We have used [firebase](#) to save the image taken and the URL is passed into Microsoft Azure Face detection web service to get the result Age and Gender of a person.

Code Explanation:-

Below is the facedetection html page.

```
1  <ion-header>
2    <ion-navbar>
3      <button ion-button menuToggle>
4        <ion-icon name="menu"></ion-icon>
5      </button>
6      <ion-title>
7        <ion-icon name="person"></ion-icon>
8        Face Detection</ion-title>
9    </ion-navbar>
10 </ion-header>
11
12 <ion-content padding>
13   <!-- <button ion-button round (click)="takePhoto()">Take a SNAP...!!</button> -->
14   <div class="row">
15     <div class="col text-center">
16       <button class="button button-dark" ion-button round (click)="takePhoto()">
17         <div padding><ion-icon name="camera" ></ion-icon></div>
18         Take Photo
19       </button>
20     </div>
21   </div>
22 </div>
23
24 <img [src]="base64Image!== '' ? base64Image : defaultImg" class="thumbnails" />
25 <div class="text-center">
26   <label>{{gender}}</label><br />
27   <label>{{age}}</label>
28 </div>
29
30 </ion-content>
31
```

Below is the spec.ts file for face detection. Here I have configured firebase, so that the image taken can be stored in the firebase database.


```

1  import { async, ComponentFixture, TestBed } from '@angular/core/testing';
2  import { HomePage } from './home';
3  import { HttpClient } from '@angular/common/http';
4  import { Camera } from '@ionic-native/camera';
5  import { HttpClientModule } from '@angular/common/http';
6  import { IonicModule, NavController, ToastController } from 'ionic-angular';
7  import { AngularFireModule } from 'angularfire2';
8  import { AngularFireStorage } from 'angularfire2/storage';
9  import { AngularFireDatabase } from 'angularfire2/database';
10
11  describe('HomePage', () => {
12      let comp: HomePage;
13      let fixture: ComponentFixture<HomePage>;
14      var config = {
15          apiKey: "AIzaSyAP_15gqGDixEFlC2dBbzzrGzNhZ17CUJg",
16          authDomain: "lab-assignment2-c325f.firebaseio.com",
17          databaseURL: "https://lab-assignment2-c325f.firebaseio.com",
18          projectId: "lab-assignment2-c325f",
19          storageBucket: "lab-assignment2-c325f.appspot.com",
20          messagingSenderId: "685304153045"
21      };
22      beforeEach(async(() => {
23          TestBed.configureTestingModule({
24              declarations: [HomePage],
25              imports: [
26                  AngularFireModule,
27                  HttpClientModule,
28                  AngularFireModule.initializeApp(config),
29                  IonicModule.forRoot(HomePage)
30              ],
31              providers: [

```

Below is the .ts file for face detection. here we have called two function takephoto() to capture the photo and sending it to firebase and then extracting the URL, sending it to microsoft azure web service.

```
constructor(public navCtrl: NavController,  
  private afStorage: AngularFireStorage,  
  public http:HttpClient,  
  public fireDb: AngularFireDatabase,  
  private toastCtrl: ToastController,  
  private camera: Camera) {  
  this.authId = localStorage.getItem("uid");  
}  
  
takePhoto() {  
  const options: CameraOptions = {  
    quality: 50,  
    destinationType: this.camera.DestinationType.DATA_URL,  
    encodingType: this.camera.EncodingType.JPEG,  
    mediaType: this.camera.MediaType.PICTURE,  
    targetWidth: 1000,  
    targetHeight: 1000  
  }  
  
  this.camera.getPicture(options).then((imageData) => {  
    this.base64Image = 'data:image/jpeg;base64,' + imageData;  
    let push = true;  
    if (this.authId !== null && push === true) {  
      let ref= this.afStorage.ref(`images/123456`).putString(this.base64Image,'data_url');  
      ref.task.snapshot.ref.getDownloadURL().then(data=>{  
        this.getResults(data);  
      });  
    }  
  })  
}
```

```

getResults(downloadURL){
    let headers = new HttpHeaders({
        "Content-Type": "application/json",
        "Ocp-Apim-Subscription-Key": "6c660e3adfd7446698c30e611bde5b1a"
    });
    let obj = {
        "url":downloadURL
    }
    let url = "https://westus.api.cognitive.microsoft.com/face/v1.0/detect?returnFaceAttributes=age,ge
    this.http.post(url, obj, { headers: headers }).subscribe(data => {
        this.gender = "Gender : "+data[0]["faceAttributes"]["gender"];
        this.age = "Age : "+data[0]["faceAttributes"]["age"];
    });
}
/*
    This method will show the Toast messages.
*/
presentToast(msg) {
    let toast = this.toastCtrl.create({
        message: msg,
        duration: 3000,
        position: 'top'
    });

    toast.onDidDismiss(() => {
        console.log('Dismissed toast');
    });

    toast.present();
}

```

App.module.ts file output:-

```

1  import { BrowserModule } from '@angular/platform-browser';
2  import { ErrorHandler, NgModule } from '@angular/core';
3  import { IonicApp, IonicErrorHandler, IonicModule } from 'ionic-angular';
4  import { HttpClientModule } from '@angular/common/http';
5  import { AngularFireAuthModule } from 'angularfire2/auth';
6  import { AngularFireDatabaseModule } from 'angularfire2/database';
7  import { AngularFireStorageModule } from 'angularfire2/storage';
8  import { AngularFireModule } from 'angularfire2';
9  import { Camera } from '@ionic-native/camera';
10
11
12  import { MyApp } from './app.component';
13  import { HomePage } from '../pages/home/home';
14
15  import { StatusBar } from '@ionic-native/status-bar';
16  import { SplashScreen } from '@ionic-native/splash-screen';
17  import { VideosearchPage } from '../pages/videosearch/videosearch';
18  import { PopoverComponent } from '../components/popover/popover';
19  import { YoutubeVideoPlayer } from '@ionic-native/youtube-video-player';
20
21
22  var config = {
23    apiKey: "AIzaSyAP_15gqGDixEF1C2dBbzzrGzNhZ17CUJg",
24    authDomain: "lab-assignment2-c325f.firebaseio.com",
25    databaseURL: "https://lab-assignment2-c325f.firebaseio.com",
26    projectId: "lab-assignment2-c325f",
27    storageBucket: "lab-assignment2-c325f.appspot.com",
28    messagingSenderId: "685304153045"
29  };
30

```

App.component.ts file output:-

```

1  import { Component, ViewChild } from '@angular/core';
2  import { Nav, Platform } from 'ionic-angular';
3  import { StatusBar } from '@ionic-native/status-bar';
4  import { SplashScreen } from '@ionic-native/splash-screen';
5  import { HomePage } from '../pages/home/home';
6  import { VideosearchPage } from '../pages/videosearch/videosearch';
7
8
9
10 @Component({
11   templateUrl: 'app.html'
12 })
13 export class MyApp {
14   @ViewChild(Nav) nav: Nav;
15
16   rootPage: any = HomePage;
17
18   pages: Array<{title: string, component: any}>;
19
20   constructor(public platform: Platform, public statusBar: StatusBar, public splashScreen: SplashScreen) {
21     this.initializeApp();
22
23     // used for an example of ngFor and navigation
24     this.pages = [
25       { title: 'Face Detection', component: HomePage },
26       { title: 'Video Search', component: VideosearchPage }
27     ];
28   }
29 }
30

```

Required Screenshots:-

Output Page:-



Face Detection



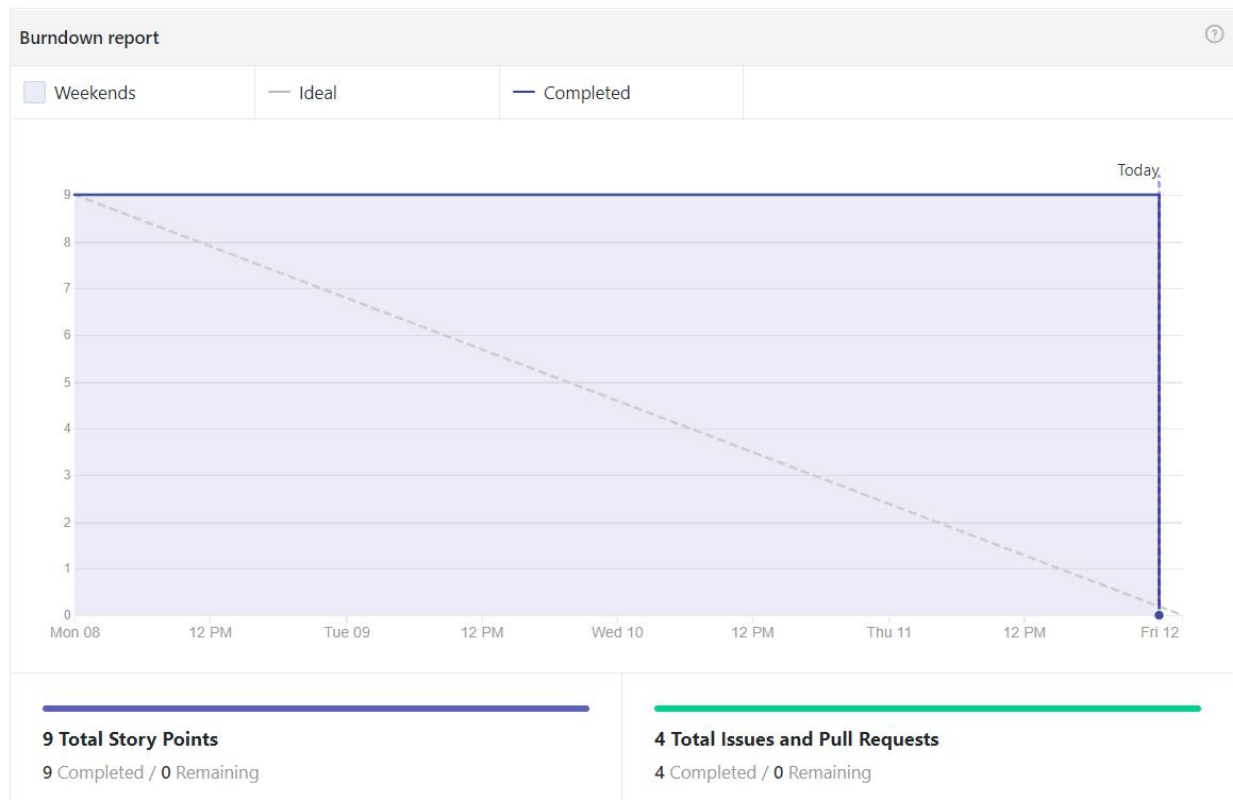
TAKE PHOTO



Gender: Male

Age: 26

Zenhub Tool



Contribution By

Rahul Reddy Yerva

- Implemented youtube video search app using Youtube API and youtube cordova plugin.
- Implemented Face detection App using Microsoft Azure Face Detection API and Cordova Camera Plugin.

Kavin Kumar Arumugam

- Implemented Login and Register Activity in Android using Firebase Authentication.
- Used Google Cloud Text Recognizer Vision API to do text recognition from the camera.
- Added camera source to the android app.