**[Term Project](https://bb-csuohio.blackboard.com/webapps/assignment/uploadAssignment?content_id=_6362386_1&course_id=_168060_1&group_id=&mode=view)**

Develop an ineresting mobile app that uses one or more sensors with substantial complexity.

Minimum features:

(1) user management with login and user registration;

(2) data persistency with MySQL Lite or cloud storage;

(3) at least three activities;

(4) using at least one sensor for the core logic of the application.

The lines of code of the source code (excluding the layout specification) are expected to be 500 or more for a passing grade on the project.

Solution:

We have tried to create a Trip Management App where we can enter our destination place and it will give us a route to reach there from our current location.

It has registration and login activity and it uses gps sensor from mobile.

We have used google firebase for database, authentication and cloud properties.

Registraton:

The Registration Activity allows users to sign up by providing their name, email, and password. Key points include:

* The code checks if the user has entered valid values for name, email, and password.
* Utilizes Firebase Authentication to create a new user account.

XML Layout (Registration):

* Contains EditText fields for name, email, and password.
* Buttons for submitting the registration and canceling.

public void onClick(View v) {  
 String name = binding.editTextName.getText().toString();  
 String email = binding.editTextEmail.getText().toString();  
 String password = binding.editTextPassword.getText().toString();  
  
 if(name.isEmpty()){  
 Toast.*makeText*(getActivity(), "Enter valid name!", Toast.*LENGTH\_SHORT*).show();  
 } else if(email.isEmpty()){  
 Toast.*makeText*(getActivity(), "Enter valid email!", Toast.*LENGTH\_SHORT*).show();  
 } else if (password.isEmpty()){  
 Toast.*makeText*(getActivity(), "Enter valid password!", Toast.*LENGTH\_SHORT*).show();  
 } else {  
 mAuth.createUserWithEmailAndPassword(email,password).addOnCompleteListener(new OnCompleteListener<AuthResult>()

Xml Code:

<EditText  
 android:id="@+id/editTextName"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:ems="10"  
 android:inputType="textPersonName"  
 android:hint="@string/name\_label"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
<EditText  
 android:id="@+id/editTextEmail"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="16dp"  
 android:ems="10"  
 android:hint="@string/email\_label"  
 android:inputType="textEmailAddress"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/editTextName" />  
  
<EditText  
 android:id="@+id/editTextPassword"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="16dp"  
 android:ems="10"  
 android:hint="@string/password\_label"  
 android:inputType="textPassword"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/editTextEmail" />  
  
<Button  
 android:id="@+id/buttonSignup"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="16dp"  
 android:text="@string/submit\_label"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/editTextPassword" />  
  
<Button  
 android:id="@+id/buttonCancel"  
 style="@style/Widget.MaterialComponents.Button.TextButton"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="16dp"  
 android:text="@string/cancel\_label"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/buttonSignup" />

Login:

The Login Activity handles user authentication by checking the entered email and password against existing accounts. Key points include:

* Validates email and password fields.
* Uses Firebase Authentication to sign in the user.

XML Layout (Login):

* Contains EditText fields for email and password.
* Buttons for logging in and creating a new account.

Xml code

<EditText  
 android:id="@+id/editTextEmail"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:ems="10"  
 android:hint="@string/email\_label"  
 android:inputType="textEmailAddress"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
<EditText  
 android:id="@+id/editTextPassword"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="16dp"  
 android:ems="10"  
 android:hint="@string/password\_label"  
 android:inputType="textPassword"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/editTextEmail" />  
  
<Button  
 android:id="@+id/buttonLogin"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="16dp"  
 android:text="@string/login\_label"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/editTextPassword" />  
  
<Button  
 android:id="@+id/buttonCreateNewAccount"  
 style="@style/Widget.MaterialComponents.Button.TextButton"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="16dp"  
 android:text="@string/create\_account\_label"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/buttonLogin" />

Java Code:

public void onClick(View v) {  
 String email = binding.editTextEmail.getText().toString();  
 String password = binding.editTextPassword.getText().toString();  
 if(email.isEmpty()){  
 Toast.*makeText*(getActivity(), "Enter valid email!", Toast.*LENGTH\_SHORT*).show();  
 } else if (password.isEmpty()){  
 Toast.*makeText*(getActivity(), "Enter valid password!", Toast.*LENGTH\_SHORT*).show();  
 } else {  
  
 mAuth.signInWithEmailAndPassword(email,password).addOnCompleteListener(new OnCompleteListener<AuthResult>() {  
 @Override  
 public void onComplete(@NonNull Task<AuthResult> task) {  
 if (task.isSuccessful()) {  
 mListener.goToTripsFragment();  
 } else {  
 Toast.*makeText*(getActivity(), task.getException().toString(), Toast.*LENGTH\_SHORT*).show();  
 }  
 }  
 });

Creating Trip

This Activity lets users create a new trip by entering a destination. Key features include:

* Checks and requests location permissions.
* Retrieves the user's current location.
* Saves trip details to Firestore, including location, start time, and user ID.

XML Layout (Create Trip):

* EditText for entering the destination.
* TextViews for displaying the current location status.
* Buttons for submitting the trip details.

Xml code:

<EditText  
 android:id="@+id/editTextDestination"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="16dp"  
 android:layout\_marginTop="16dp"  
 android:layout\_marginEnd="16dp"  
 android:ems="10"  
 android:hint="Name"  
 android:inputType="textPersonName"  
 android:minHeight="48dp"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
<TextView  
 android:id="@+id/textView2"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="16dp"  
 android:layout\_marginTop="16dp"  
 android:text="Current Location :"  
 android:textSize="17sp"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/editTextDestination" />  
  
<TextView  
 android:id="@+id/locationStatus"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="10dp"  
 android:text="TextView"  
 android:textSize="17sp"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toEndOf="@+id/textView2"  
 app:layout\_constraintTop\_toTopOf="@+id/textView2" />  
  
<Button  
 android:id="@+id/submitButton"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginBottom="20dp"  
 android:text="@string/submit\_label"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent" />

Java code:

public void onClick(View view) {  
 String locationTag = String.*valueOf*(binding.editTextDestination.getText());  
 if (locationTag.isEmpty()) {  
 Toast.*makeText*(getContext(), "Please enter Destination Name", Toast.*LENGTH\_SHORT*).show();  
 } else {  
  
 if (ActivityCompat.*checkSelfPermission*(getContext(), Manifest.permission.*ACCESS\_FINE\_LOCATION*) != PackageManager.*PERMISSION\_GRANTED* && ActivityCompat.*checkSelfPermission*(getContext(), Manifest.permission.*ACCESS\_COARSE\_LOCATION*) != PackageManager.*PERMISSION\_GRANTED*) {  
 getLocation();  
 return;  
 }else{  
 fusedLocationClient.getCurrentLocation(102, null)  
 .addOnSuccessListener(new OnSuccessListener<Location>() {  
 @Override  
 public void onSuccess(Location location) {  
 Log.*d*(TAG, "onSuccess: LAT LONG"+location.getLatitude()+"LONG---"+location.getLongitude());  
 HashMap<String,Object> val = new HashMap<>();  
 val.put("location",locationTag);  
 val.put("start\_time",new Timestamp(new Date()));  
 val.put("complete\_time",null);  
 val.put("complete",0);  
 val.put("total\_miles",null);  
 val.put("user\_id",userID);  
 val.put("start\_lat",location.getLatitude());  
 val.put("start\_long",location.getLongitude());  
 val.put("end\_lat",null);  
 val.put("end\_long",null);  
  
 Trip trip = new Trip(val);  
  
 DocumentReference docRef = db.collection("directions").document();  
  
 docRef.set(val)  
 .addOnSuccessListener(new OnSuccessListener<Void>() {  
 @Override  
 public void onSuccess(Void unused) {  
 mListener.goToTripDetails(trip,docRef.getId());  
 }  
 })  
 .addOnFailureListener(new OnFailureListener() {  
 @Override  
 public void onFailure(@NonNull Exception e) {  
 getActivity().runOnUiThread(new Runnable() {  
 @Override  
 public void run() {  
 Toast.*makeText*(getContext(), "Failed to save data to server", Toast.*LENGTH\_SHORT*).show();  
 }  
 });  
  
 }  
 });  
  
 }  
 })  
 .addOnFailureListener(new OnFailureListener() {  
 @Override  
 public void onFailure(@NonNull Exception e) {  
 Toast.*makeText*(getContext(), "Failed to get Location", Toast.*LENGTH\_SHORT*).show();  
 }  
 });  
 }  
  
  
 }  
 }  
}

Trip Details

Displays details of a specific trip, including start time, completion time, current status, and location on a map.

* Requests location permission before retrieving the location.
* Displays a map with markers for the trip's start and end points.

XML Layout (Trip Details):

* TextViews for trip information such as location name, start time, completion time, current status, and miles.
* Button for completing the trip.

Java code:

public void getLocation(){  
 requestPermissionLauncher.launch(*ACCESS\_FINE\_LOCATION*);  
}  
  
private ActivityResultLauncher<String> requestPermissionLauncher =  
 registerForActivityResult(new ActivityResultContracts.RequestPermission(), isGranted -> {  
 if (isGranted) {  
 Log.*d*(TAG, ": ALLOWED");  
 } else {  
 Log.*d*(TAG, ": NOT ALLOWED");  
 Toast.*makeText*(getContext(), "Please allow location to proceed", Toast.*LENGTH\_SHORT*).show();  
 getLocation();  
 }  
 });  
  
public void updatePoints(){  
 LatLng point1 = new LatLng(tripObjectForMaps.getStart\_lat(),tripObjectForMaps.getStart\_long());  
 mGoogleMap.addMarker(new MarkerOptions().position(point1));  
 Integer paddingValue = 100;  
  
 LatLngBounds.Builder builder = new LatLngBounds.Builder();  
 builder.include(point1);  
  
 if (tripObjectForMaps.getEnd\_lat() != null){  
 LatLng point2 = new LatLng(tripObjectForMaps.getEnd\_lat(),tripObjectForMaps.getEnd\_long());  
 mGoogleMap.addMarker(new MarkerOptions().position(point2));  
 builder.include(point2);  
 paddingValue = 100;  
 LatLngBounds latLngBounds = builder.build();  
 mGoogleMap.animateCamera(CameraUpdateFactory.*newLatLngBounds*(latLngBounds,paddingValue));  
  
 }else{  
 CameraPosition cameraPosition = new CameraPosition.Builder()  
 .target(point1)  
 .zoom(17)  
 .build();  
 mGoogleMap.animateCamera(CameraUpdateFactory.*newCameraPosition*(cameraPosition));  
 }  
  
  
}

Xml Code:

<TextView  
 android:id="@+id/textViewLocation"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="16dp"  
 android:layout\_marginTop="16dp"  
 android:layout\_marginEnd="16dp"  
 android:text="Trip To Store"  
 android:textSize="20sp"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
<TextView  
 android:id="@+id/textView3"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="8dp"  
 android:text="Started At: "  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toStartOf="@+id/textViewLocation"  
 app:layout\_constraintTop\_toBottomOf="@+id/textViewLocation" />  
  
<TextView  
 android:id="@+id/textViewStartTime"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="8dp"  
 android:text="01/19/2022"  
 android:textSize="16sp"  
 app:layout\_constraintEnd\_toEndOf="@+id/textViewLocation"  
 app:layout\_constraintStart\_toEndOf="@+id/textView3"  
 app:layout\_constraintTop\_toTopOf="@+id/textView3" />  
  
<TextView  
 android:id="@+id/textView5"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="8dp"  
 android:text="Completed At:"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toStartOf="@+id/textView3"  
 app:layout\_constraintTop\_toBottomOf="@+id/textView3" />  
  
<TextView  
 android:id="@+id/textViewCompletedAt"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="8dp"  
 android:text="N/A"  
 android:textSize="16sp"  
 app:layout\_constraintEnd\_toEndOf="@+id/textViewStartTime"  
 app:layout\_constraintStart\_toEndOf="@+id/textView5"  
 app:layout\_constraintTop\_toTopOf="@+id/textView5" />  
  
<TextView  
 android:id="@+id/textViewcurrentStatus"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="8dp"  
 android:text="On Going"  
 android:textSize="19sp"  
 app:layout\_constraintStart\_toStartOf="@+id/textView5"  
 app:layout\_constraintTop\_toBottomOf="@+id/textView5" />  
  
<Button  
 android:id="@+id/completeButton"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="8dp"  
 android:minHeight="48dp"  
 android:text="COMPLETE"  
 app:layout\_constraintEnd\_toEndOf="@+id/textViewCompletedAt"  
 app:layout\_constraintTop\_toBottomOf="@+id/textViewCompletedAt" />  
  
<TextView  
 android:id="@+id/textViewTotalMiles"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="5.8 Miles"  
 android:textSize="16sp"  
 app:layout\_constraintBottom\_toBottomOf="@+id/textViewcurrentStatus"  
 app:layout\_constraintEnd\_toEndOf="@+id/textViewCompletedAt"  
 app:layout\_constraintTop\_toBottomOf="@+id/textView5" />  
  
<com.google.android.gms.maps.MapView  
 android:id="@+id/mapView"  
 android:layout\_width="0dp"  
 android:layout\_height="0dp"  
 android:layout\_marginTop="32dp"  
 android:contentDescription="@string/map\_view"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/textViewcurrentStatus" />

Xml code to display all the trip details in list view:

Displays a list of all trips with their start time, completion time, status, and miles.

<TextView  
 android:id="@+id/textViewLocationName"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="8dp"  
 android:text="Trip to Store"  
 android:textSize="22sp"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
<TextView  
 android:id="@+id/textView4"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="8dp"  
 android:text="Started At:"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/textViewLocationName" />  
  
<TextView  
 android:id="@+id/textViewStartTiming"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="8dp"  
 android:text="TextView"  
 android:textSize="16sp"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toEndOf="@+id/textView4"  
 app:layout\_constraintTop\_toBottomOf="@+id/textViewLocationName" />  
  
<TextView  
 android:id="@+id/textView7"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="8dp"  
 android:text="Completed At:"  
 android:textSize="16sp"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/textView4" />  
  
<TextView  
 android:id="@+id/textViewCompletedTimeValue"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="8dp"  
 android:text="TextView"  
 android:textSize="16sp"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toEndOf="@+id/textView7"  
 app:layout\_constraintTop\_toBottomOf="@+id/textViewStartTiming" />  
  
<TextView  
 android:id="@+id/textViewStatus"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginStart="8dp"  
 android:layout\_marginTop="8dp"  
 android:text="On going"  
 android:textSize="20sp"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/textView7" />  
  
<TextView  
 android:id="@+id/textViewMiles"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="TextView"  
 android:textSize="16sp"  
 app:layout\_constraintBottom\_toBottomOf="@+id/textViewStatus"  
 app:layout\_constraintEnd\_toEndOf="@+id/textViewCompletedTimeValue"  
 app:layout\_constraintTop\_toTopOf="@+id/textViewStatus" />

Screenshots:

App starts with this screen, so if it’s a new user they will have to click on “Create new account”.

A screenshot of a login form

Description automatically generated

Here is registration or creating new account:

A screenshot of a login form

Description automatically generated A screenshot of a cell phone

Description automatically generated A white background with black dots

Description automatically generated

This is how login works:

A screenshot of a phone

Description automatically generated A white background with black dots

Description automatically generated

Creating Trip and completing it:

A white background with black dots

Description automatically generatedA white background with black dots

Description automatically generatedA screenshot of a keyboard

Description automatically generated

A screenshot of a cell phone

Description automatically generatedA screenshot of a cell phone

Description automatically generated

Trip completed is diaplayed like this:

A screenshot of a phone

Description automatically generated

Commpleted trips and ongoing trips and displayed like this:

A screenshot of a phone

Description automatically generated

Firebase :

A screenshot of a web page

Description automatically generated

A screenshot of a computer

Description automatically generated

A screenshot of a computer

Description automatically generated

A cartoon of people looking at a yellow paper

Description automatically generated

All the accounts created will be stored here.

A screenshot of a computer

Description automatically generated

All the trips created and its details will be stored here:

A screenshot of a computer

Description automatically generated