Documentation

Flood detection and prevention

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Flood detection and prevention

Aim : To detect floods and prevent the major damage created by floods

Technologies used :

IBM cloud

Google Firebase cloud

Sensor Technology

Machine learning algorithms

Working :

Date from sensor technology are taken in order to predict the climatic changes for flood detection, the values taken are

->Temperature

-> Humidity

->Water-flow rate

->Level of water

Temperature is the temperature of the climate at present conditions

Humidity is present humidity in the cloud

Water-flow rate is the flow rate of water in the drainages

Level of water is water level in the dams

Thus all the values collected by the sensors are given to the Nodemcu chip which is connected to IBM cloud for detection and processing of data

The chip technology used are

->Temperature : DHT11

-> Humidity : DHT11

->Water-flow rate : YF-S201

-> Level of water : Ultrasonic sensor

The values thus obtained are forwarded to IBM cloud

In IBM cloud data is thus processes using Machine learning algorithms

The Algorithm used in cloud are

->Random Forest

The data thus obtained was send to the firebase cloud by using adapter app

Thus data uploaded to cloud is accessed through android apps i.e apps are

->Government app

->Citizen app

The Government app has the data required for government servant

It contains

->Location of defect

->Next safe location

The citizen app contains data

->Location of defect

->Next safe location

->Location of Government citizens

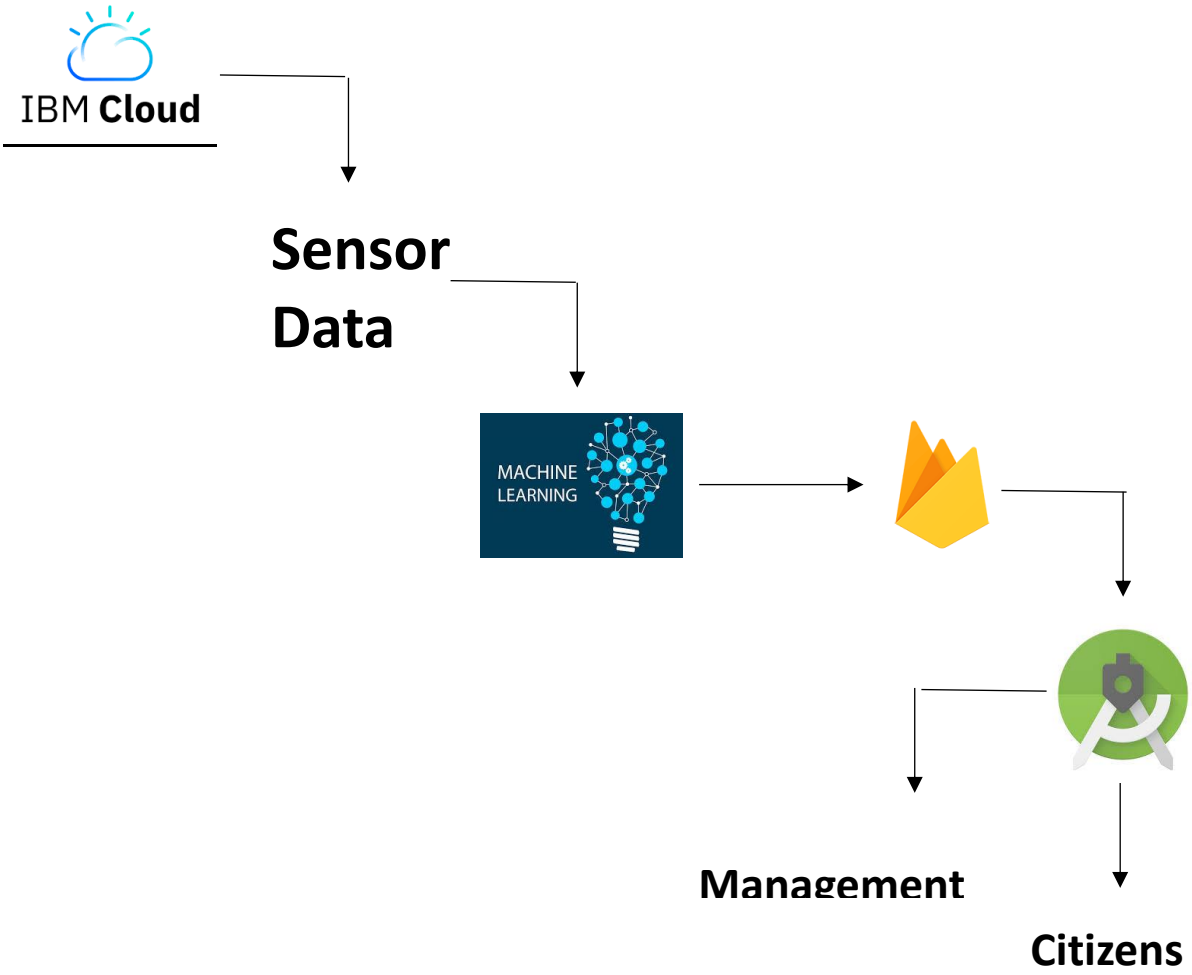
->Contact details of Government citizens

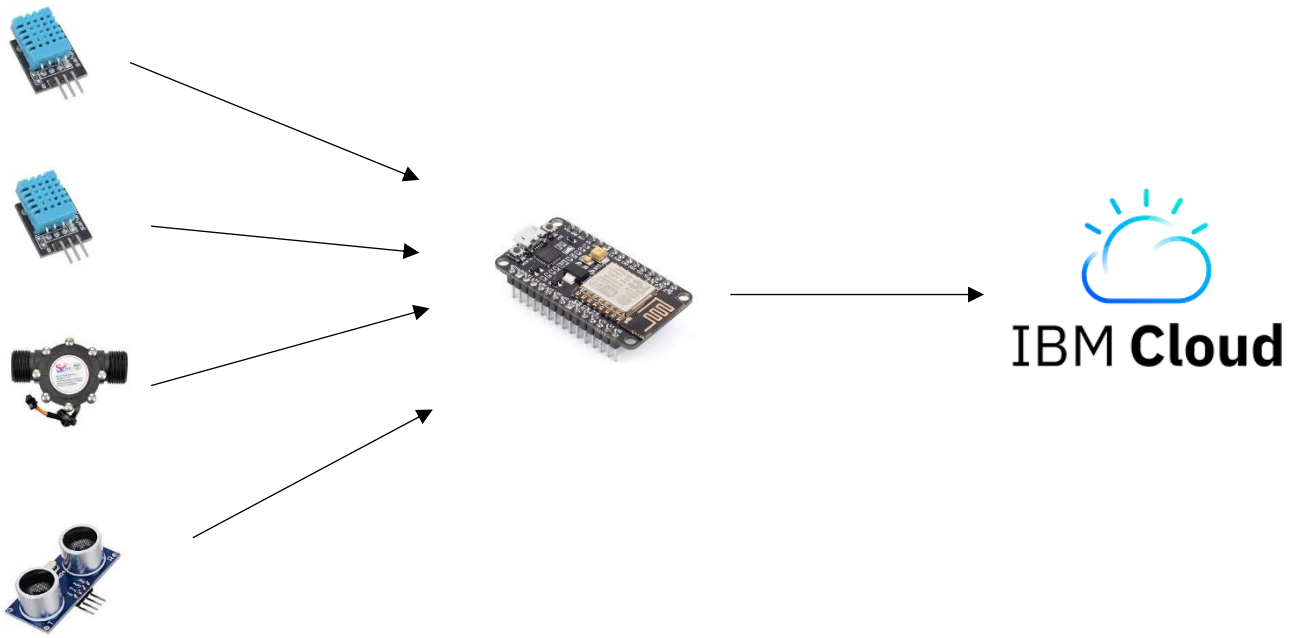
Since data comes from firebase data base the changes done is quick in the app

Other problems covered :

There is no technology up to now which specifies the drainage flow , so this give a solution to keep drain flow stable with out stagnating

Block diagram :





Code :

Main Activity :

```
package com.example.huser.citizen;

import android.content.Intent;
import android.content.res.ColorStateList;
import android.graphics.Color;
import android.graphics.drawable.ColorDrawable;
import android.net.Uri;
import android.support.annotation.NonNull;
import android.support.design.widget.FloatingActionButton;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.TextView;
import android.widget.Toast;

import com.google.firebase.database.DataSnapshot;
```

```
import com.google.firebase.database.DatabaseError;
import com.google.firebase.database.DatabaseReference;
import com.google.firebase.database.FirebaseDatabase;
import com.google.firebase.database.ValueEventListener;

public class MainActivity extends AppCompatActivity {

    TextView tv1,tv2;
    static String loc;
    FloatingActionButton fb;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        DatabaseReference  dr=
FirebaseDatabase.getInstance().getReference();
        tv1=findViewById(R.id.textView2);
        tv2=findViewById(R.id.textView3);
        fb=findViewById(R.id.floatingActionButton2);
        dr.addValueEventListener(new ValueEventListener() {
            @Override
            public void onDataChange(@NonNull DataSnapshot
dataSnapshot) {
                loc= (String)
dataSnapshot.child("gov1").child("loc").getValue();
                tv1.setText("\nLevel of water : \t" +

dataSnapshot.child("sensorvalues").child("height").getValue()+
                        "\nHumidity : \t"+

dataSnapshot.child("sensorvalues").child("humidity").getValue()+
                        "\nTemperature : \t"+

dataSnapshot.child("sensorvalues").child("temperature").getValue
()+
                        "\nWater-Flow : \t"+

dataSnapshot.child("sensorvalues").child("waterflow").getValue()
+
                        "\nFlood occurs : \t"+

dataSnapshot.child("sensorvalues").child("poffloods").getValue()
+
                        "\nFlood not occur : \t"+

dataSnapshot.child("sensorvalues").child("pofnoflood").getValue(
)+
```

```
                        "\nPrediction : \t"+

dataSnapshot.child("sensorvalues").child("prediction").getValue(
)
                );
                /*Toast.makeText(MainActivity.this,
""+dataSnapshot.child("prediction").getValue().equals("1"),
Toast.LENGTH_SHORT).show();*/
                if(Integer.parseInt((String)
dataSnapshot.child("sensorvalues").child("prediction").getValue(
))==0) {

                    tv2.setText("Flood not occurs");
                    tv2.setTextColor(Color.GREEN);

fb.setBackgroundTintList(ColorStateList.valueOf(Color.parseColor
("#008000")));
                }
                else{
                    tv2.setText("Flood occur");
                    tv2.setTextColor(Color.RED);

fb.setBackgroundTintList(ColorStateList.valueOf(Color.parseColor
("#ff0000")));
                }
            }

            @Override
            public void onCancelled(@NonNull DatabaseError
databaseError) {

            }
        });
    }

    public void search_employee(View view) {
        Intent intent = new
Intent(android.content.Intent.ACTION_VIEW,

Uri.parse("http://maps.google.com/maps?saddr=&daddr="+loc));
        startActivity(intent);
    }

    public void search_defect_location(View view) {
        Intent intent = new
Intent(android.content.Intent.ACTION_VIEW,
```

```
Uri.parse("http://maps.google.com/maps?saddr=&daddr="+"14.4493,
78.2339"));
        startActivity(intent);
    }

    public void gotonext(View view) {
        startActivity(new Intent(this,Contact.class));
    }

    public void safe(View view) {
        Intent intent = new
Intent(android.content.Intent.ACTION_VIEW,

Uri.parse("http://maps.google.com/maps?saddr=&daddr="+"16.989065
,82.247467"));
        startActivity(intent);
    }
}
```

Contact.java :

```
package com.example.huser.citizen;

import android.content.Intent;
import android.net.Uri;
import android.support.annotation.NonNull;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.TextView;

import com.google.firebase.database.DataSnapshot;
import com.google.firebase.database.DatabaseError;
import com.google.firebase.database.DatabaseReference;
import com.google.firebase.database.FirebaseDatabase;
import com.google.firebase.database.ValueEventListener;

public class Contact extends AppCompatActivity {
    String Number,Number2;
    TextView tv,tv1;
    EditText ed,ed1;
```

```
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_contact);
        tv=findViewById(R.id.textView7);
        tv1=findViewById(R.id.textView8);
        ed=findViewById(R.id.editText);
        ed1=findViewById(R.id.editText2);
        DatabaseReference dr=
FirebaseDatabase.getInstance().getReference();
        dr.addValueEventListener(new ValueEventListener() {
            @Override
            public void onDataChange(@NonNull DataSnapshot
dataSnapshot) {
                tv.setText("\nname :
"+dataSnapshot.child("gov1").child("name").getValue()+"\nphno :
"+dataSnapshot.child("gov1").child("phno").getValue());

Number=""+dataSnapshot.child("gov1").child("phno").getValue();

Number2=""+dataSnapshot.child("gov2").child("phno").getValue();
                tv1.setText("\nname :
"+dataSnapshot.child("gov2").child("name").getValue()+"\nphno :
"+dataSnapshot.child("gov2").child("phno").getValue());
            }

            @Override
            public void onCancelled(@NonNull DatabaseError
databaseError) {

            }
        });
    }

    public void call_person(View view) {
        Intent i=new Intent(Intent.ACTION_VIEW,
Uri.parse("tel:"+Number));
        startActivity(i);
    }

    public void send_sms(View view) {
        Intent smsIntent = new
Intent(android.content.Intent.ACTION_VIEW);
        smsIntent.setType("vnd.android-dir/mms-sms");
        smsIntent.putExtra("address",""+Number);
        smsIntent.putExtra("sms_body",""+ed.getText());
        startActivity(smsIntent);
```

```
    }

    public void call_gov2(View view) {
        Intent i=new Intent(Intent.ACTION_VIEW,
Uri.parse("tel:"+Number2));
        startActivity(i);

    }

    public void sms_gov2(View view) {
        Intent smsIntent = new
Intent(android.content.Intent.ACTION_VIEW);
        smsIntent.setType("vnd.android-dir/mms-sms");
        smsIntent.putExtra("address",""+Number2);
        smsIntent.putExtra("sms_body",""+ed.getText());
        startActivity(smsIntent);
    }
}
```

Layoutfile :

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context="com.example.huser.citizen.Contact">

    <TextView
        android:id="@+id/textView6"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentTop="true"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="21dp"
        android:text="Contact details"
        android:textColor="@android:color/black"
        android:textSize="24sp"
        android:textStyle="bold" />

    <TextView
        android:id="@+id/textView7"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
        android:layout_alignParentTop="true"
        android:layout_marginTop="76dp"
        android:layout_toStartOf="@+id/textView6"
        android:lineSpacingExtra="8sp"
        android:text="TextView"
        android:textSize="12sp" />

    <Button
        android:id="@+id/button2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignBaseline="@+id/textView7"
        android:layout_alignEnd="@+id/imageButton"
        android:backgroundTint="@android:color/background_light"
        android:onClick="call_person"
        android:text="Call" />

    <ImageButton
        android:id="@+id/imageButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignTop="@+id/editText"
        android:layout_marginEnd="38dp"
        android:onClick="send_sms"
        app:srcCompat="@android:drawable/ic_dialog_email" />

    <EditText
        android:id="@+id/editText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentStart="true"
        android:layout_alignParentTop="true"
        android:layout_marginStart="13dp"
        android:layout_marginTop="147dp"
        android:ems="10"
        android:hint="Enter u r sms"
        android:inputType="textPersonName" />

    <TextView
        android:id="@+id/textView8"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerVertical="true"
        android:layout_toStartOf="@+id/textView6"
        android:lineSpacingExtra="8sp"
        android:text="TextView"
```

```
        android:textSize="12sp" />

    <EditText
        android:id="@+id/editText2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentBottom="true"
        android:layout_alignStart="@+id/editText"
        android:layout_marginBottom="172dp"
        android:ems="10"
        android:hint="Enter u r sms"
        android:inputType="textPersonName" />

    <Button
        android:id="@+id/button3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignStart="@+id/button2"
        android:layout_centerVertical="true"
        android:backgroundTint="@android:color/white"
        android:text="call"
        android:onClick="call_gov2"/>

    <ImageButton
        android:id="@+id/imageButton2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignEnd="@+id/button2"
        android:layout_alignParentBottom="true"
        android:layout_marginBottom="155dp"
        app:srcCompat="@android:drawable/ic_dialog_email"
        android:onClick="sms_gov2"/>

</RelativeLayout>
```

Main activity XML file :

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
```

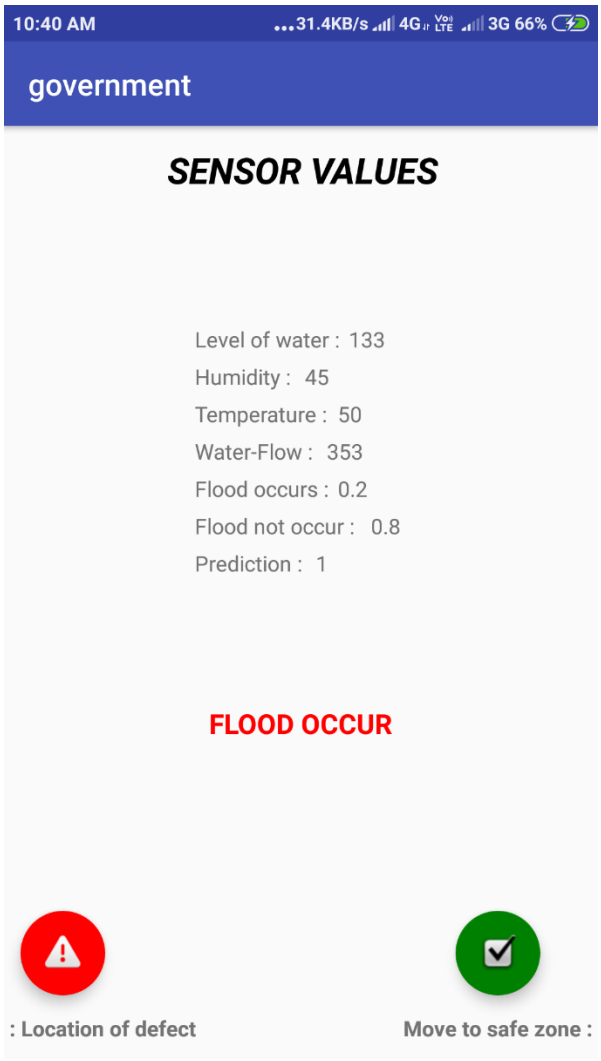
```
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">


    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentStart="true"
        android:layout_alignParentTop="true"
        android:layout_marginStart="108dp"
        android:layout_marginTop="13dp"
        android:text="Sensor values"
        android:textAllCaps="true"
        android:textColor="@android:color/background_dark"
        android:textSize="24sp"
        android:textStyle="bold|italic" />

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentTop="true"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="107dp"
        android:lineSpacingExtra="8sp"
        android:text="TextView" />

    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentBottom="true"
        android:layout_centerHorizontal="true"
        android:layout_marginBottom="210dp"
        android:text="TextView"
        android:textAllCaps="true"
        android:textColor="@android:color/black"
        android:textSize="18sp"
        android:textStyle="bold" />

    <android.support.design.widget.FloatingActionButton
        android:id="@+id/floatingActionButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
```

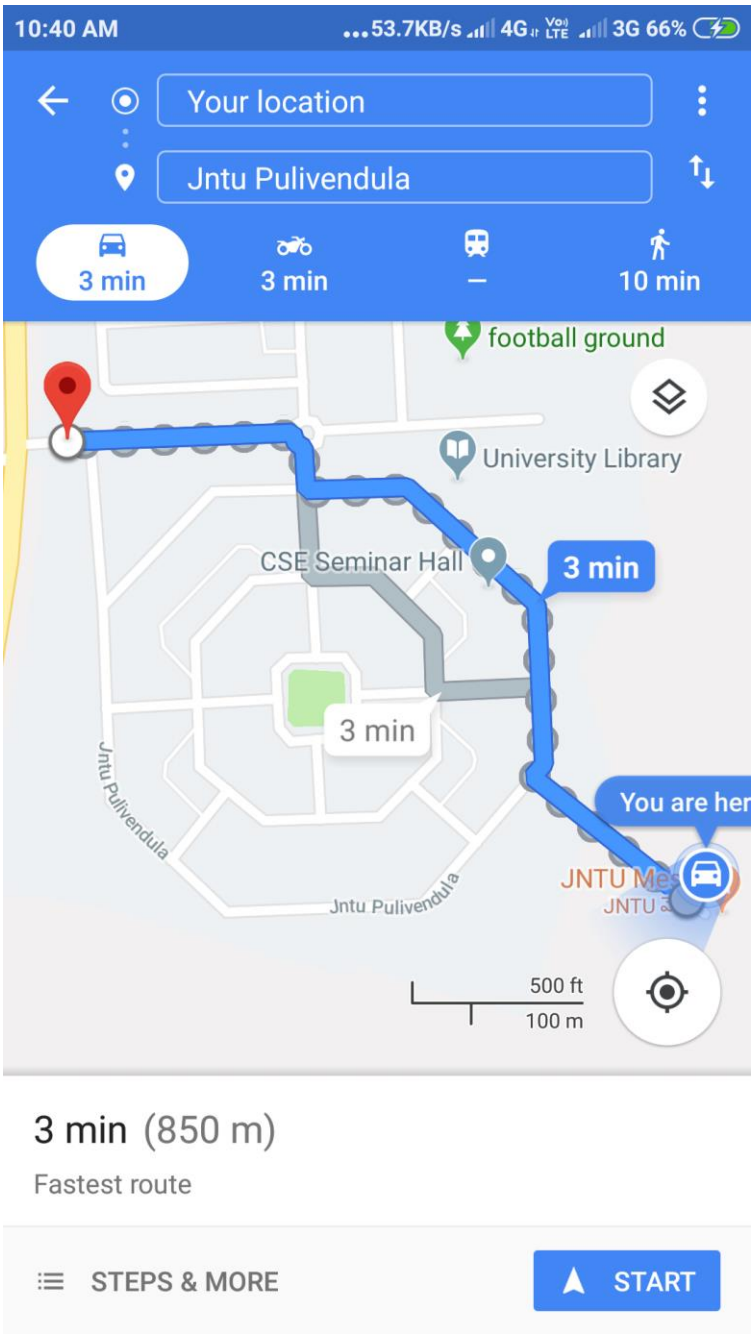
```
        android:layout_alignTop="@+id/floatingActionButton2"
        android:layout_marginEnd="13dp"
        android:clickable="true"
        android:onClick="search_employee"
        app:backgroundTint="?android:attr/colorFocusedHighlight"
        app:srcCompat="@android:drawable/btn_plus" />

    <android.support.design.widget.FloatingActionButton
        android:id="@+id/floatingActionButton2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentBottom="true"
        android:layout_alignParentStart="true"
        android:layout_marginBottom="42dp"
        android:layout_marginStart="11dp"
        android:clickable="true"
        android:onClick="search_defect_location"
        app:backgroundTint="@android:color/holo_blue_bright"
        app:srcCompat="@android:drawable/ic_dialog_alert" />

    <TextView
        android:id="@+id/textView4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentBottom="true"
        android:layout_alignParentStart="true"
        android:layout_marginBottom="11dp"
        android:text=" : Location of defect"
        android:textStyle="bold" />

    <TextView
        android:id="@+id/textView5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignTop="@+id/textView4"
        android:text="search near you : "
        android:textStyle="bold" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentBottom="true"
        android:layout_centerHorizontal="true"
        android:layout_marginBottom="125dp"
        android:backgroundTint="@android:color/holo_blue_bright"
```

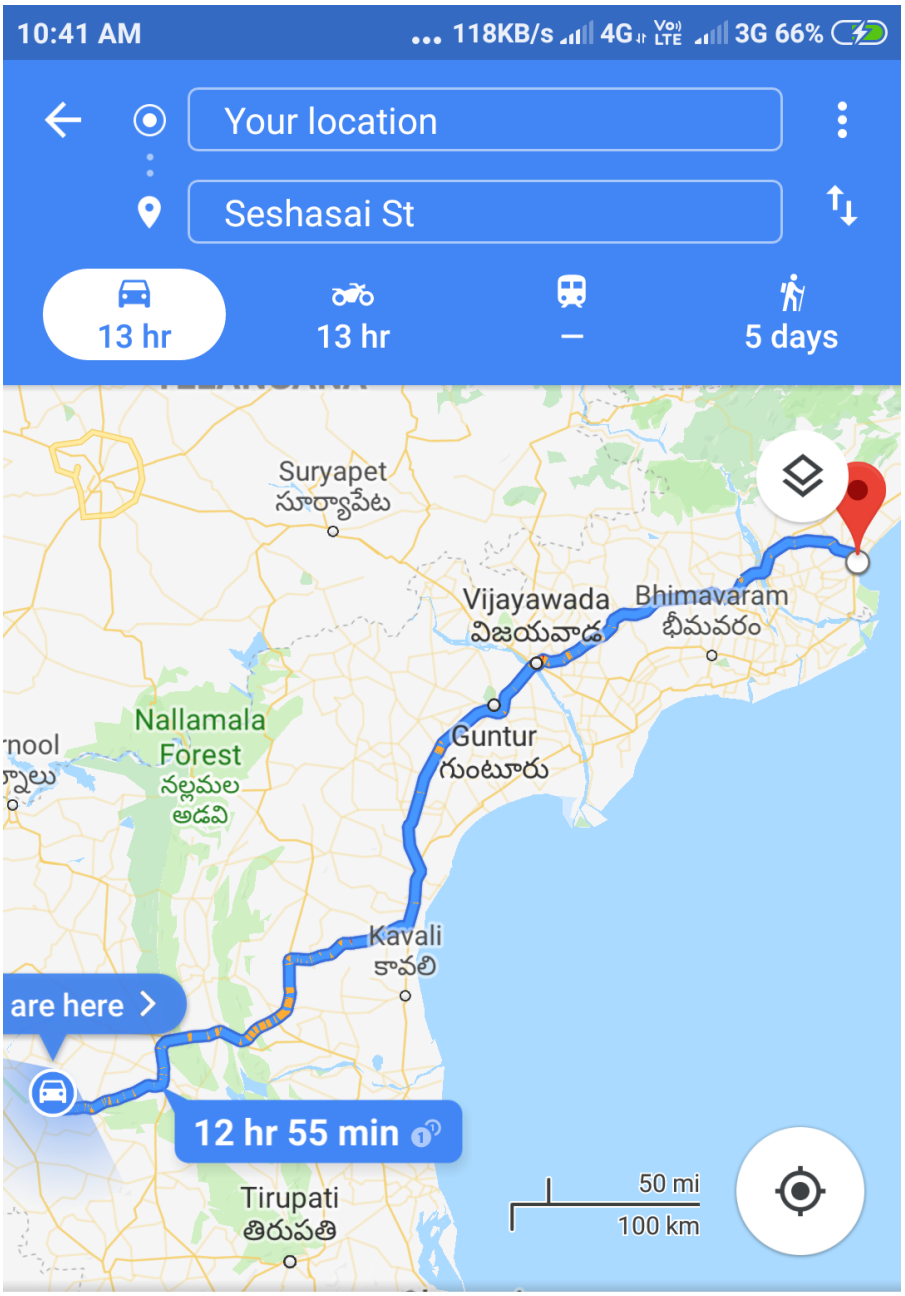
```
        android:text="contact info"
        android:textStyle="bold"
        android:onClick="gotonext"/>

    <android.support.design.widget.FloatingActionButton
        android:id="@+id/floatingActionButton3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignBottom="@+id/textView4"
        android:layout_centerHorizontal="true"
        android:clickable="true"
        app:backgroundTint="#008000"
        app:srcCompat="@android:drawable/checkbox_on_background"
        android:onClick="safe"/>
</RelativeLayout>
```

ScreenShots :

Government app :




10:40 AM
...53.7KB/s 4G 3G 66%
Your location
Jntu Pulivendula
3 min
3 min
–
10 min
football ground
University Library
CSE Seminar Hall
3 min
3 min
Jntu Pulivendula
Jntu Pulivendula
You are her
JNTU Me
JNTU
500 ft
100 m
3 min (850 m)
Fastest route
STEPS & MORE
START



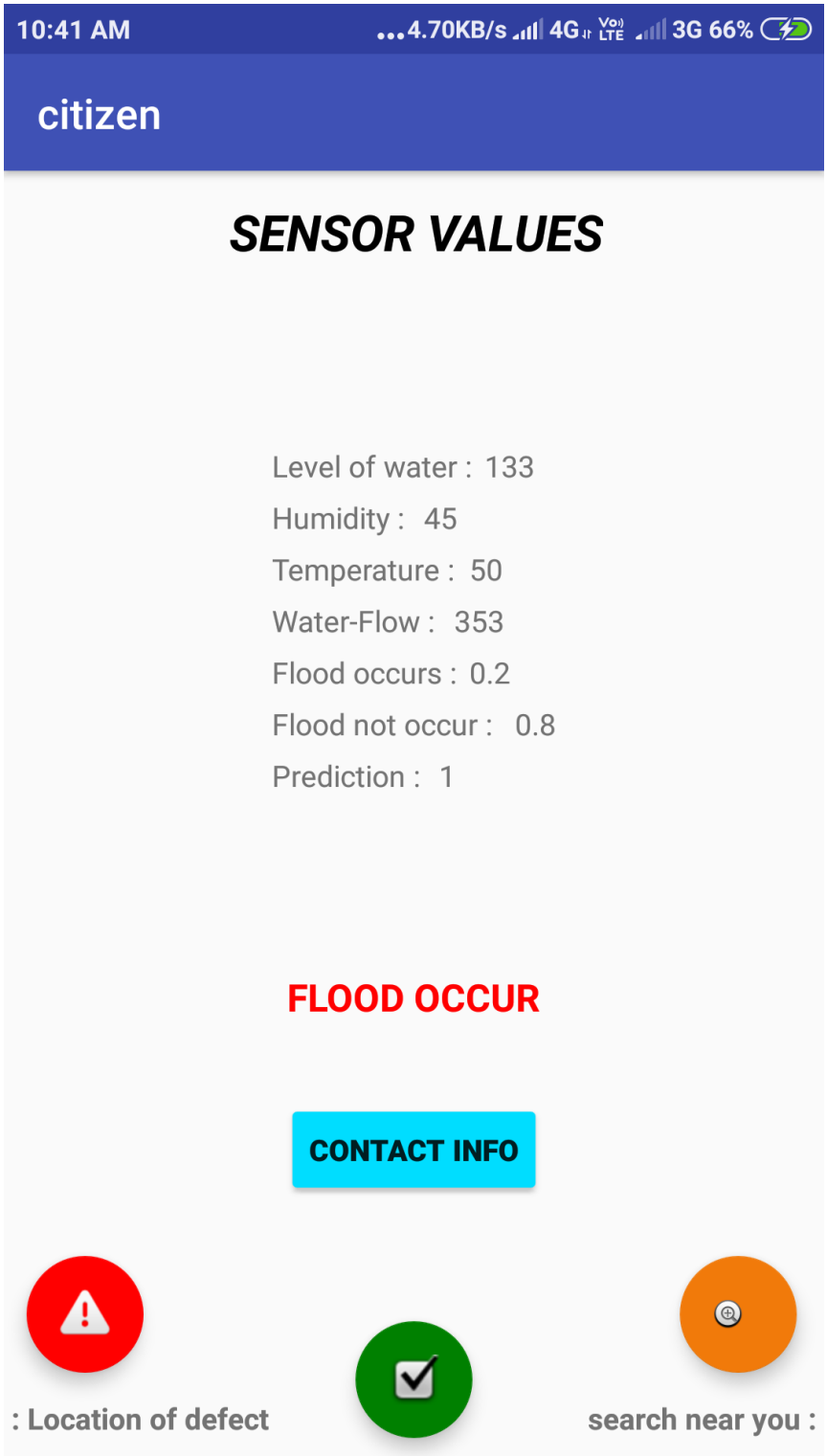
12 hr 55 min (670 km)

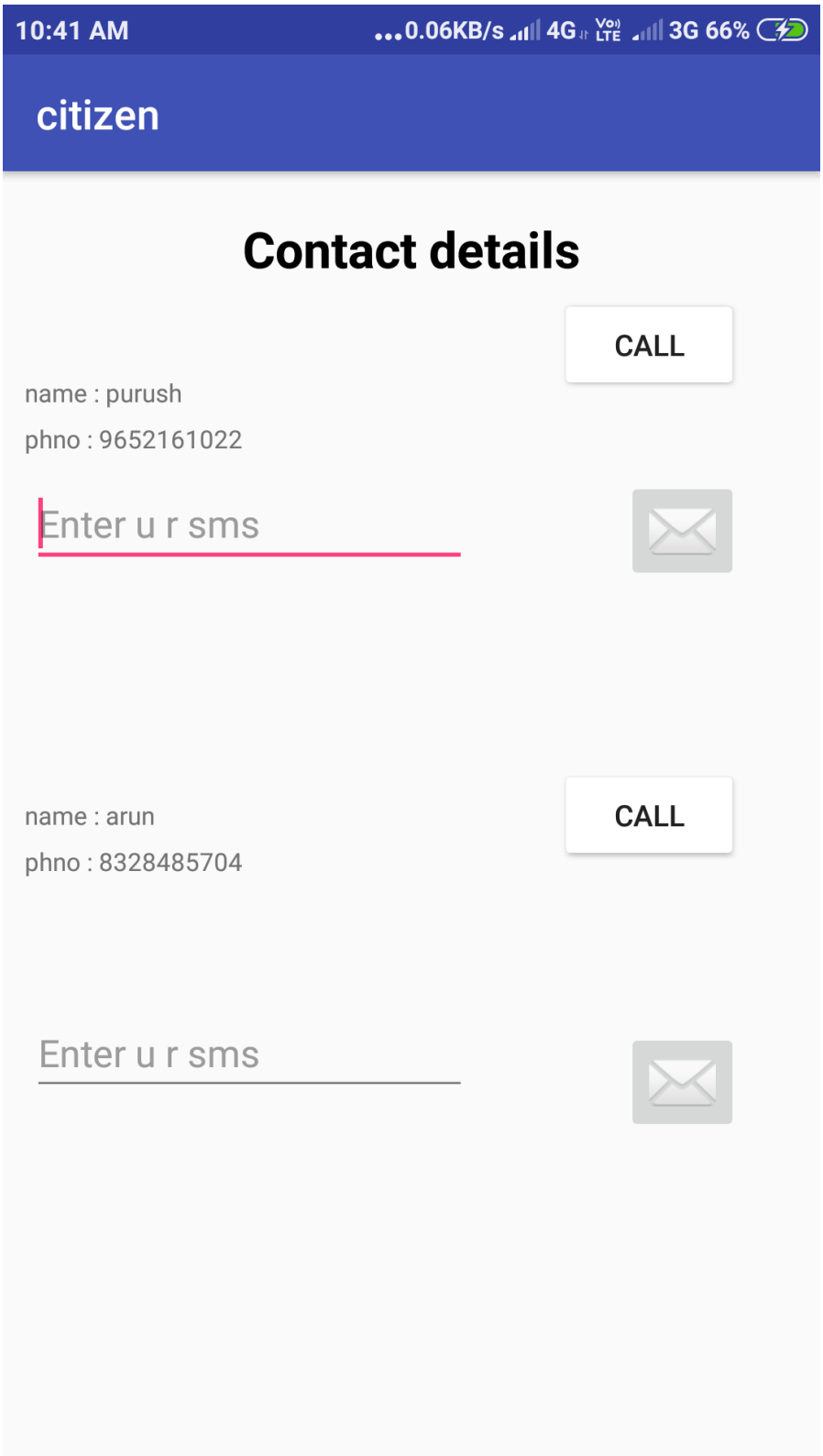
Fastest route, the usual traffic

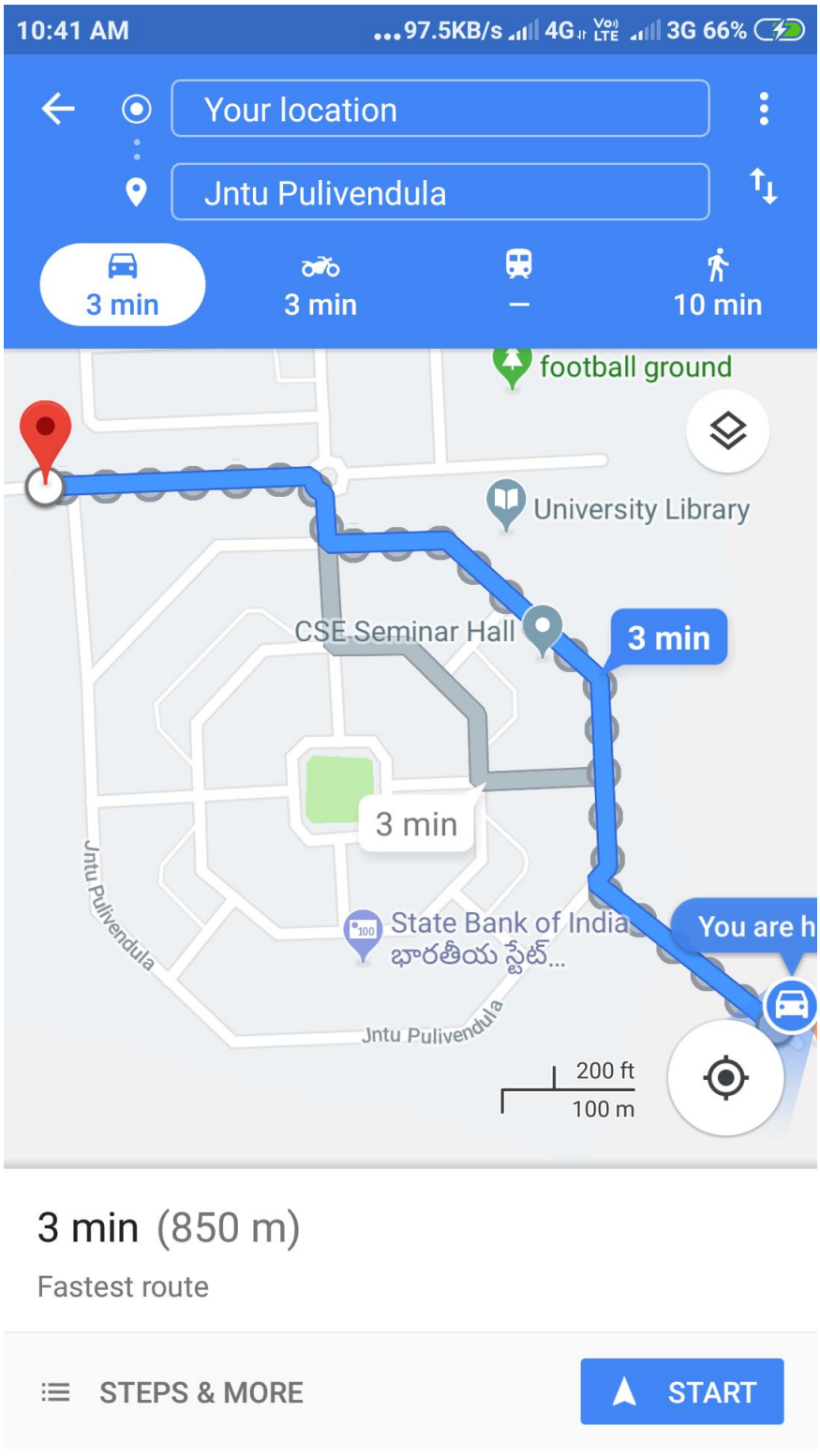
STEPS & MORE

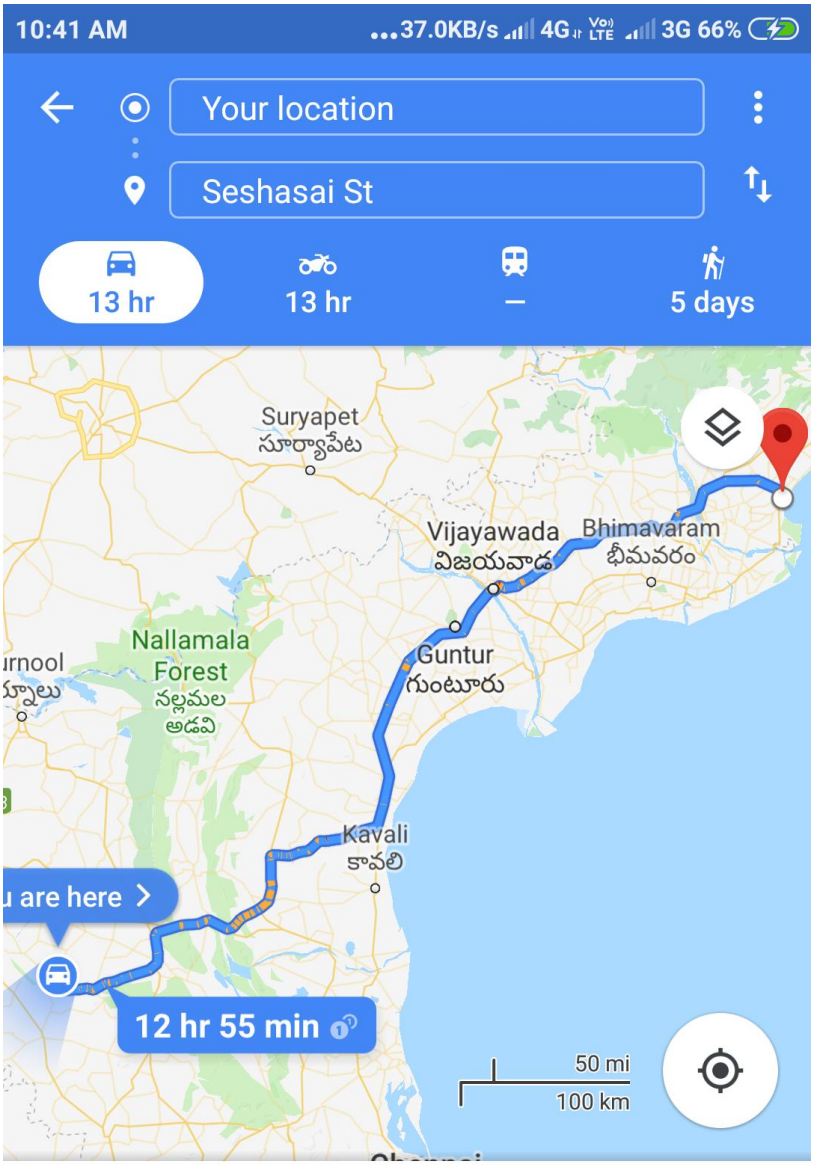
START

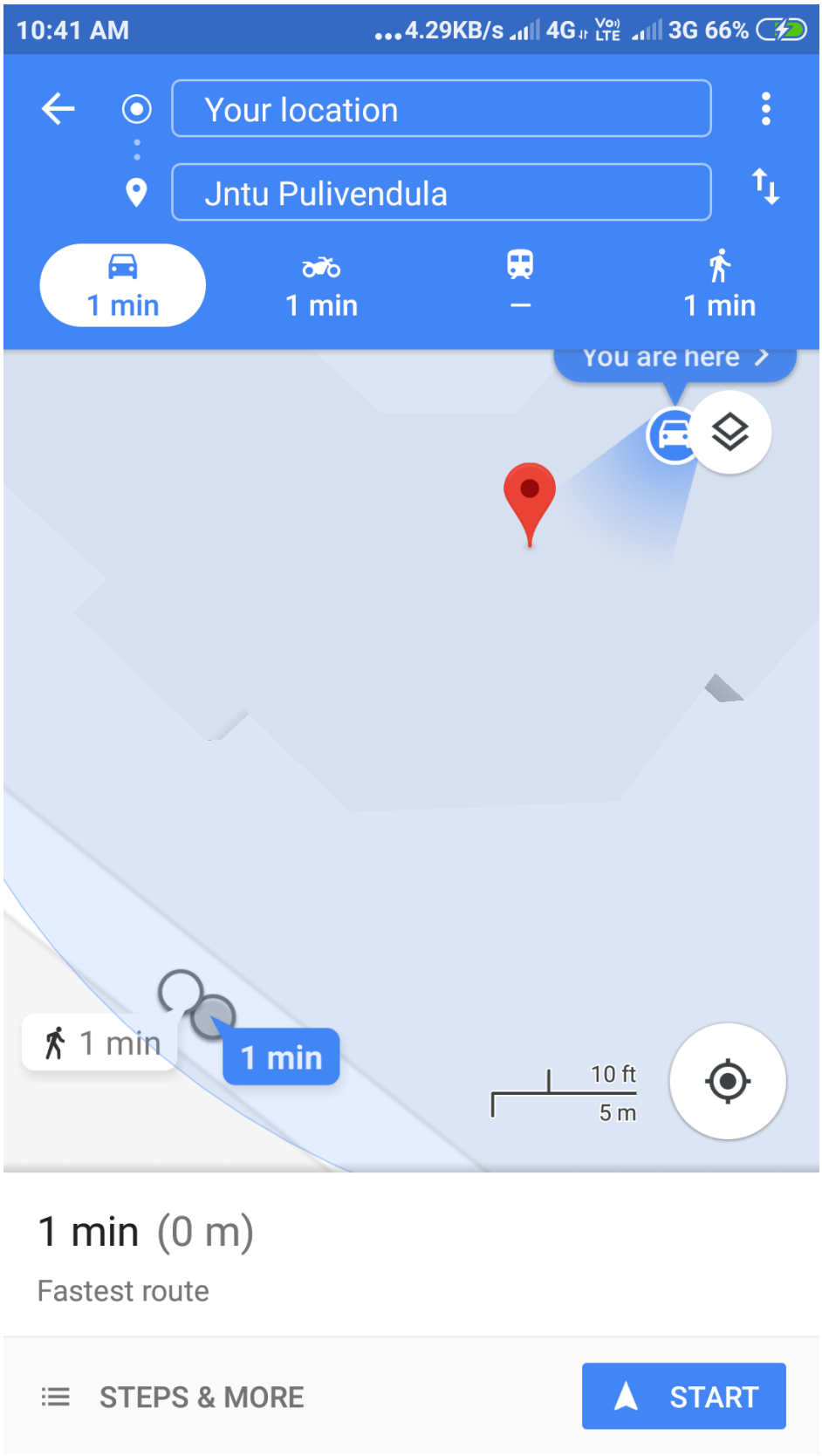
Citizen app :


10:41 AM
4.70KB/s 4G 3G 66%
citizen
SENSOR VALUES
Level of water : 133
Humidity : 45
Temperature : 50
Water-Flow : 353
Flood occurs : 0.2
Flood not occur : 0.8
Prediction : 1
FLOOD OCCUR
CONTACT INFO
: Location of defect
search near you :


10:41 AM
0.06KB/s 4G 3G 66%
citizen
Contact details
CALL
name : purush
phno : 9652161022
Enter u r sms
name : arun
phno : 8328485704
CALL
Enter u r sms


10:41 AM
97.5KB/s 4G 3G 66%
Your location
Jntu Pulivendula
3 min
3 min
—
10 min
football ground
University Library
CSE Seminar Hall
3 min
3 min
Jntu Pulivendula
State Bank of India
భారతీయ స్టేట్...
You are h
Jntu Pulivendula
200 ft
100 m
3 min (850 m)
Fastest route
STEPS & MORE
START


10:41 AM
...37.0KB/s 4G VoLTE 3G 66%
Your location
Seshasai St
13 hr
13 hr
—
5 days
Suryapet
సూర్యాపేట
Vijayawada
విజయవాడ
Bhimavaram
భీమవరం
Nallamala
Forest
నల్లమల
అడవి
Guntur
గుంటూరు
Kavali
కావలి
are here
12 hr 55 min
50 mi
100 km
12 hr 55 min (670 km)
Fastest route, the usual traffic
STEPS & MORE
START


10:41 AM
4.29KB/s 4G 3G 66%
Your location
Jntu Pulivendula
1 min
1 min
–
1 min
You are here
1 min
1 min
10 ft
5 m
1 min (0 m)
Fastest route
STEPS & MORE
START

Conclusion :

The Algorithm predicts the occurrence of flood with a accuracy of 80%

The apps shows data and works with accuracy

The prediction and prevention of floods is implemented with a good accuracy using above apps

Links :

https://github.com/purushpurush/flood_detect_hackathon.git

https://github.com/purushpurush/Titans_JNTUCEP.git