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Introduction:

- This ICP is got to know about usage of API's like google maps and usage of components like sensors, accelerometer sensor in android devices.

Programming elements:

- Android Studio
- Google Maps API

Objective:

- Display the user current location
- Providing line from source to destination on maps using google API
- Using Accelerometer sensor providing readings
- The corresponding code snippets for this ICP is given below.
- My maps activity which is having google API along with key is shown below.

```
// Building the parameters to the web service
String parameters = str_origin + "&" + str_dest + "&" + sensor + "&" + mode+"&key=AIzaSyCEPaRwc2fKch2iLfxjpXfSHfZ8_vH6tXs

// Output format
String output = "json";

// Building the url to the web service
String url = "https://maps.googleapis.com/maps/api/directions/" + output + "?" + parameters;


return url;
}
```

- Accelerometer activity to obtain the parameters like x,y,z readings shown below.

```
private void getAccelerometer(SensorEvent event) {
    float[] values = event.values;
    // Movement
    float x = values[0];
    float y = values[1];
    float z = values[2];

    float accelationSquareRoot = (x * x + y * y + z * z)
            / (SensorManager.GRAVITY_EARTH * SensorManager.GRAVITY_EARTH);
    long actualTime = event.timestamp;
    if (accelationSquareRoot >= 2) //
    {
        if (actualTime - lastUpdate < 200) {
            return;
        }
        lastUpdate = actualTime;
        Toast.makeText(this, "Device was shuffed", Toast.LENGTH_SHORT)
                .show();
        if (color) {
            view.setBackgroundColor(Color.GREEN);
        } else {
            view.setBackgroundColor(Color.RED);
        }
        color = !color;
    }
}

@Override
```

- Main Activity which uses the onclick location method to display user current location and providing the line from source to destination given below.

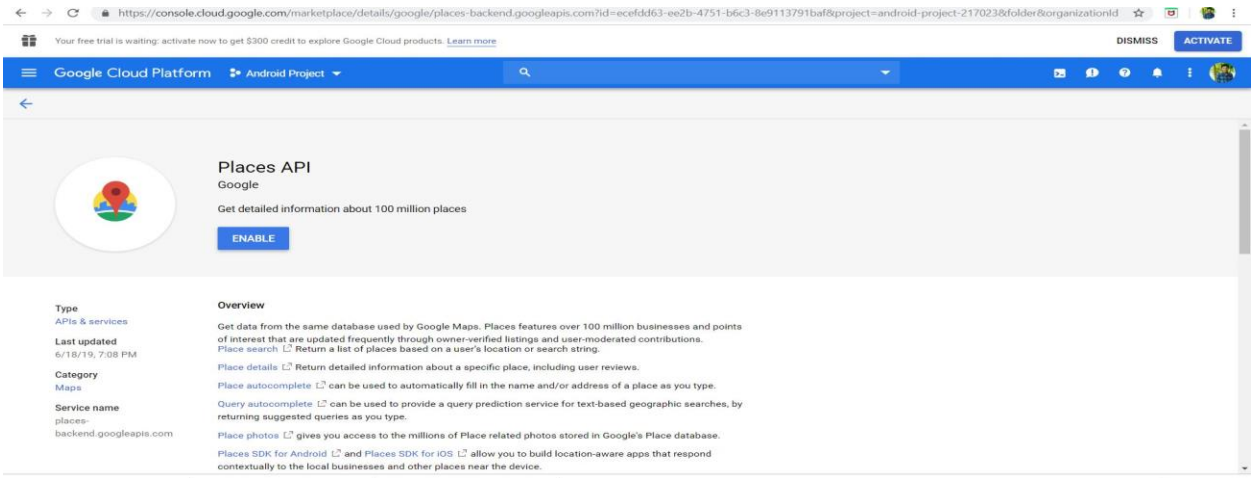
```
public class MainActivity extends AppCompatActivity {

    Button button_map, button_photo;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        if (ActivityCompat.checkSelfPermission(this, android.Manifest.permission.ACCESS_FINE_LOCATION)!= PackageManager.PERMISSION_GRANTED && A
                Manifest.permission.ACCESS_COARSE_LOCATION) != PackageManager.PERMISSION_GRANTED) {
            return;
        }
    }

    public void onPhotoClick(View v) {
        //This code redirects the from main page to the maps page.
        Intent redirect = new Intent(MainActivity.this, CameraActivity.class);
        startActivity(redirect);
    }

    public void onLocationClick(View v) {
        //This code redirects to the photo activity.
        Intent redirect = new Intent(MainActivity.this, MyMapsActivity.class);
        startActivity(redirect);
    }

    public void onSensorClick(View v){
        Intent redirect = new Intent(MainActivity.this, Accelerometer.class);
        startActivity(redirect);
    }
```

- It has additional feature like usage of camera in order to get snaps.

```
import android.view.View;
import android.widget.Button;
import android.widget.ImageView;
import android.widget.Toast;

public class CameraActivity extends AppCompatActivity {

    int TAKE_PHOTO_CODE = 0;
    ImageView userImage ;
    private static final int MY_CAMERA_REQUEST_CODE = 100;


    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_camera);
        Button capture = (Button) findViewById(R.id.btn_take_photo);
        userImage = (ImageView) findViewById(R.id.view_photo);
        //Button click eventlistener. Initializes the camera.
        Toast.makeText(this,"In camera activity",Toast.LENGTH_SHORT).show();
        if (checkSelfPermission(android.Manifest.permission.CAMERA) != PackageManager.PERMISSION_GRANTED) {
            requestPermissions(new String[]{android.Manifest.permission.CAMERA}, MY_CAMERA_REQUEST_CODE);
        }

    }

    public void callCamera(View v) {
        //Toast.makeText(getApplicationContext(),"on take photo click",Toast.LENGTH_SHORT).show();
        Intent cameraIntent = new Intent(MediaStore.ACTION_IMAGE_CAPTURE);
        if (cameraIntent.resolveActivity(getPackageManager()) != null) {
            startActivityForResult(cameraIntent, TAKE_PHOTO_CODE);
        }
    }

    //If the photo is captured then set the image view to the photo captured.
    @Override
    protected void onActivityResult(int requestCode, int resultCode, Intent data) {
        super.onActivityResult(requestCode, resultCode, data);
```

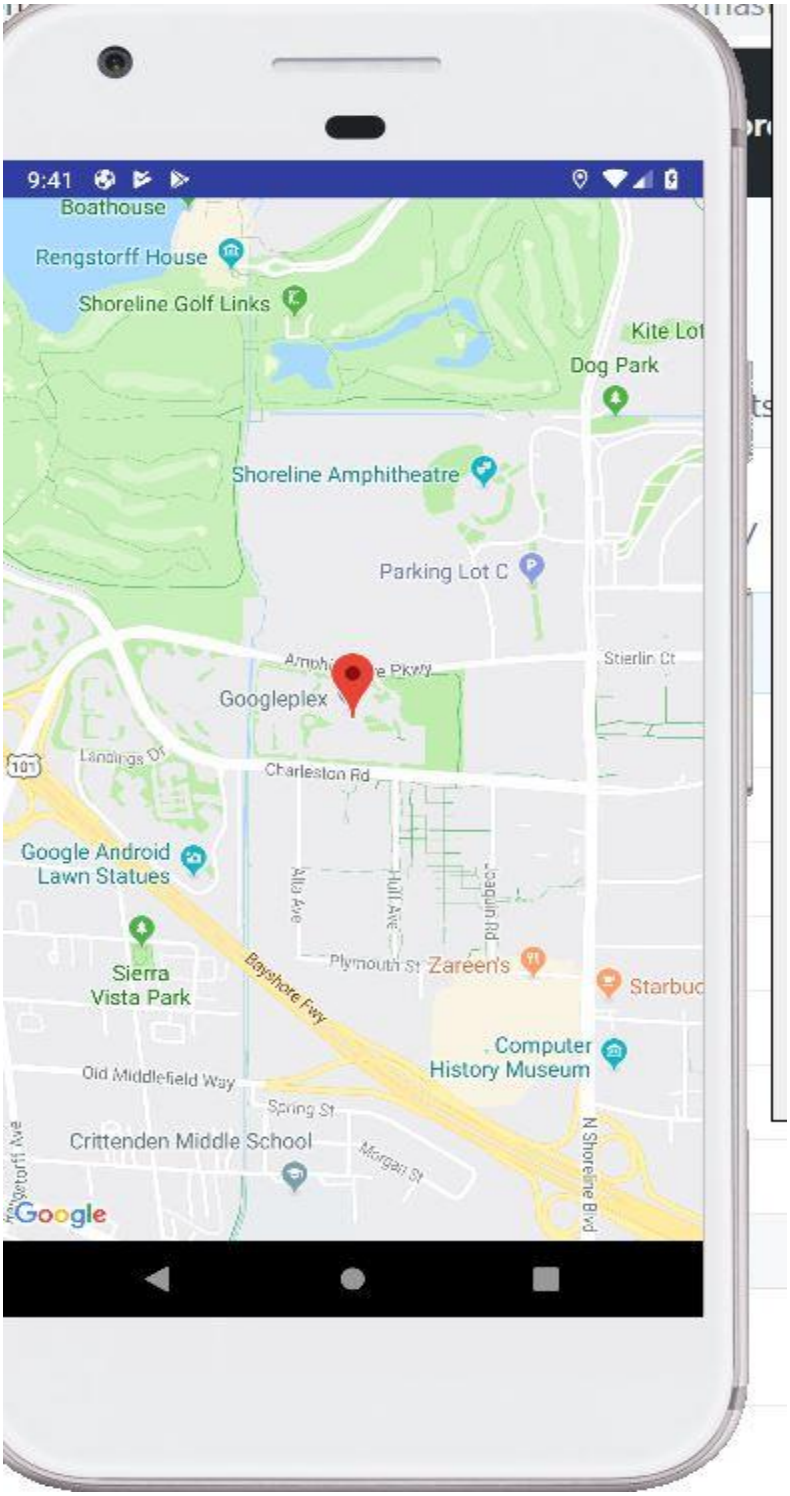
CameraActivity › onActivityResult()

- Google maps API obtaining method

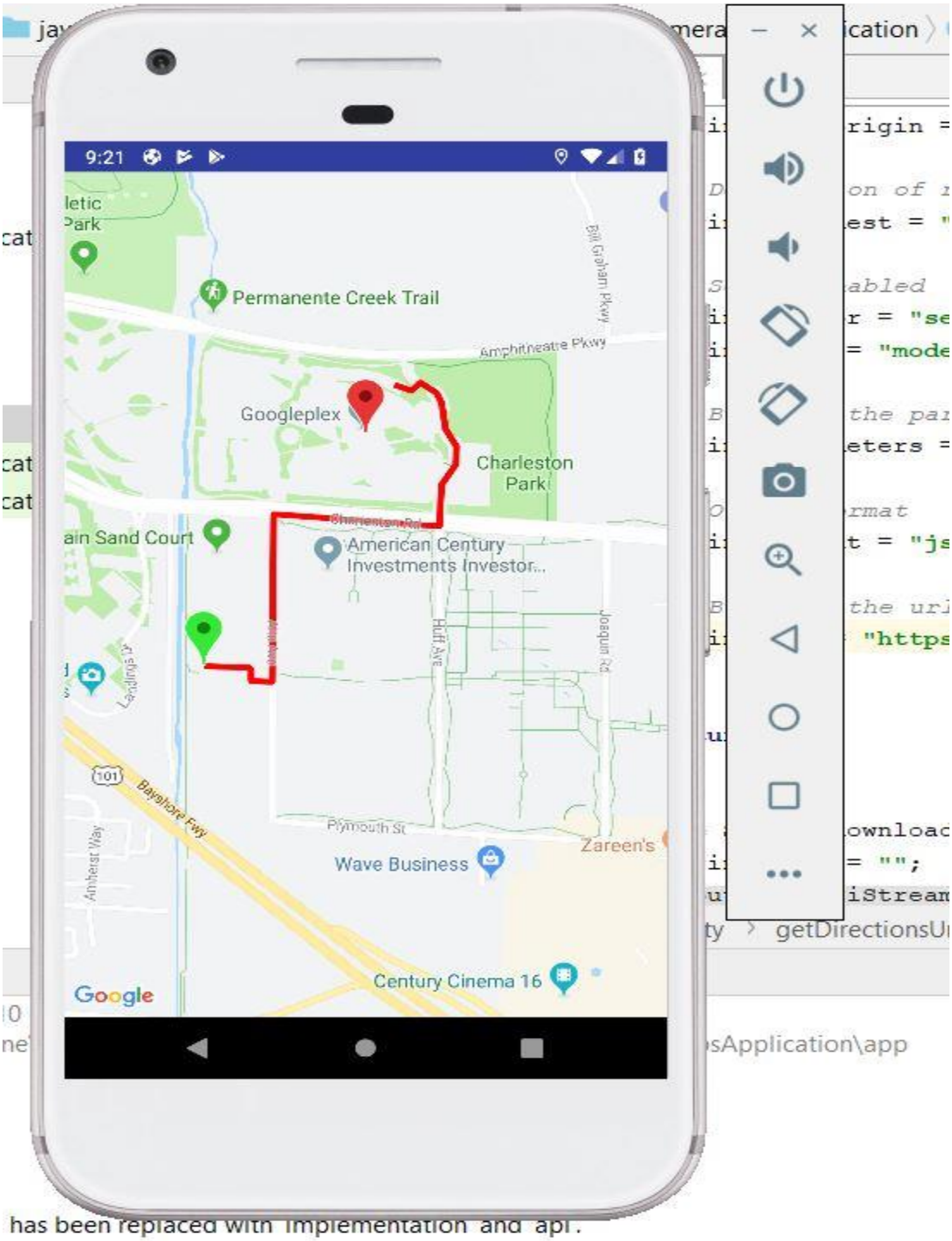


Output:

- Displaying current location of user with marker



- Providing line from required point lo location



has been replaced with 'implementation' and 'api'.

- Displaying accelerometer sensor readings like x,y,z readings

Conclusion:

- Hence learnt how to use API's and sensors in android devices and developed an application using android studio.