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The Geo-location app

Goal: Allow a parent to set up a geo-fencing monitor for their child. The parent sets a point and a radius within which the child is supposed to be. If the child moves out of that, the parent is notified.

App user interface: There are two apps, parent and child.

The parent app does two things

1. Create parent userid
2. Set preferences for the parent
3. Get status

The child app does only one thing – once activated with the parent's userid, it constantly sends its location to a server.

You should have received designs along with this document to give you some ideas.

Web Version of the above app

Visit https://firebaseio.com/ and explore the various options. Our goal is to create Android apps that communicate with the backend using JSON.

URI's for JSON Services required to build the two apps explained above

1. Create parent userid

    a. Assuming you have four properties userID, latitude, longitude and radius.
    b. Create JSON string from this JSONObject in java using JSONObject to JSON conversion API.

```
JSONObject jsonObject = new JSONObject();
jsonObject.put("username",userName.getText().toString());
jsonObject.put("latitude", latitude.getText().toString());
jsonObject.put("longitude", longitude.getText().toString());
jsonObject.put("radius",radius.getText().toString());
```

    c. HTTP PUT above JSON to @"https://turntotech.firebaseio.com/digitalleash/<userid>.json.
    Note - <userid> is taken from text field

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2. Update child's current location

    a. Create JSON from this JSONObject

        i.
        ```
        JSONObject jsonObject = new JSONObject();
        jsonObject.put("child_latitude", latitude.getText().toString());
        jsonObject.put("child_longitude", longitude.getText().toString());
        ```

        ii. Convert *jsonObject* to JSON String.

    b. HTTP PATCH request – send above JSON to
    https://turntotech.firebaseio.com/digitalleash/<userid>.json

3. Get status

    a. Send HTTP GET request to /digitalleash/<userid>.json

        i. Convert JSON to JSONObject and extract value and compute child is in zone?
        ii. How to Compute is in zone?
        You have two Locations. There is a built-in method Location.distanceTo
        iii. Now if radius is less than equal then child is in zone.

Technologies we'll explore

1. HTTP, JSON and some debugging tools
2. HTTP calls using Android
3. Synchronous vs. asynchronous calls. Pros and cons.
4. Underlying design patterns for asynchronous
5. Android Studio interface builder
6. Lifecycle of a simple Android app
7. User interface development for Android
8. JSON-JSONObject conversions

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Deliverables

1. Build the parent app

2. Build the child app

3. Test the parent-- - child apps in various location combinations (Location will be entered by user)

Optional

Update the latitude and longitude using GPS. Given below is a sample code:

```
LocationManager locationManager = (LocationManager)
this.getSystemService(LOCATION_SERVICE);
locationManager.requestLocationUpdates(LocationManager.GPS_PROVIDER, (long) 1000, (float) 10,
new LocationListener() {

        @Override

        public void onLocationChanged(Location location)
           { // here you get the current location

           double lat = location.getLatitude();
            double lon = location.getLongitude();

        }

        @Override

        public void onStatusChanged(String provider, int status, Bundle extras) {

        }

        @Override

        public void onProviderEnabled(String provider) {

        }

        @Override

        public void onProviderDisabled(String provider) {

        }
});
```

Completion

- Make sure parent can be created
- Make sure child can report location
- Make sure parent can check all three status values: *unknown, in the zone, not in the zone,* without restarting the parent app
- Make sure an existing parent is able to change the zone
- Make sure the app shows a Toast message if there is no Internet.
- Code Review with Instructor