Project 4 Task 2

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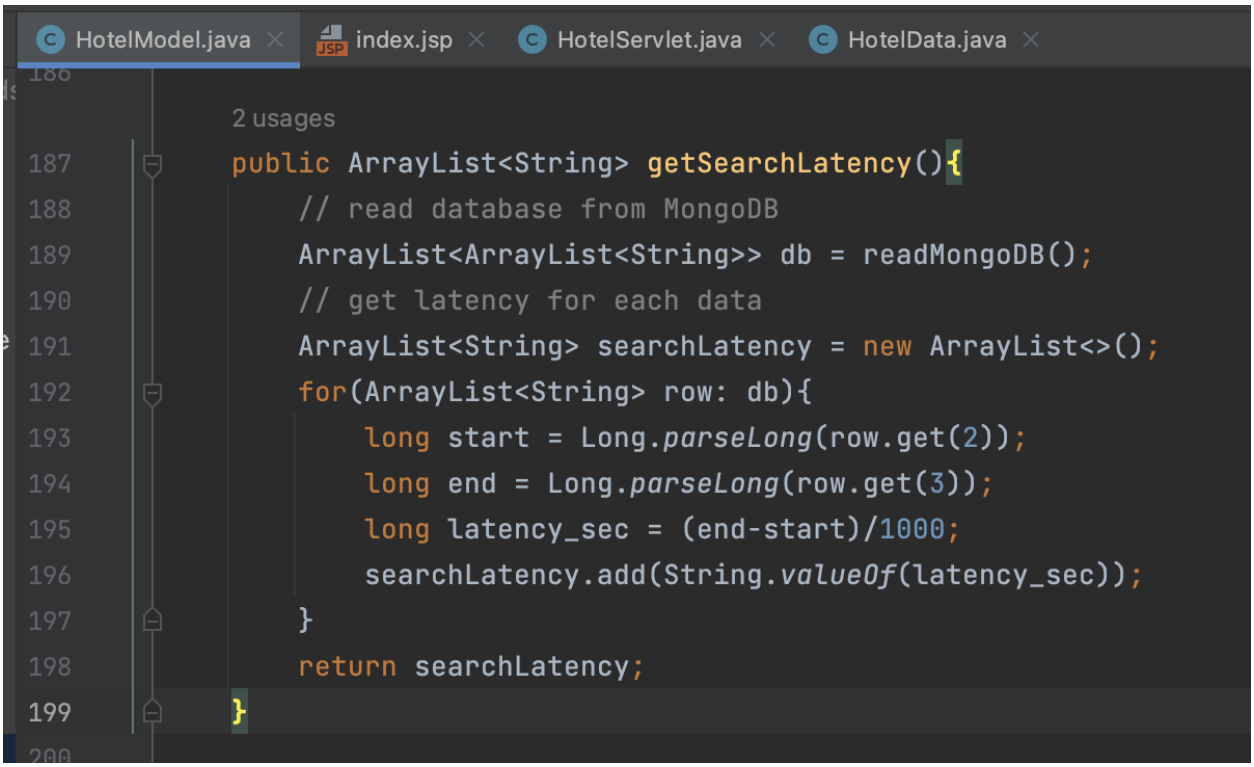
Dashboard - Operations analytics*3



HotelModel.java | index.jsp | HotelServlet.java | HotelData.java

```
1 usage
201     public String getAverageLatency(){
202         ArrayList<String> searchLatency = getSearchLatency();
203         long total = 0;
204         for(String latency: searchLatency){
205             long latency_long = Long.parseLong(latency);
206             total += latency_long;
207         }
208         long avg = total/searchLatency.size();
209         return String.valueOf(avg);
210     }
211
```

HotelModel.java | index.jsp | HotelServlet.java | HotelData.java

```
1 usage
213 public Map<String, Integer> getTopSearch(){
214     // read database from MongoDB
215     ArrayList<ArrayList<String>> db = readMongoDB();
216     Map<String, Integer> searchCityCount = new HashMap<>();
217     for(ArrayList<String> row: db){
218         String city = row.get(0);
219         // https://mkyong.com/java/java-how-to-update-the-value-of-a-key-in-hashmap/
220         searchCityCount.put(city, searchCityCount.containsKey(city) ? searchCityCount.get(city) + 1 : 1);
221     }
222
223     // Sorting reference to https://mkyong.com/java/how-to-sort-a-map-in-java/
224     // 1. Convert Map to List of Map
225     List<Map.Entry<String, Integer>> list =
226             new LinkedList<Map.Entry<String, Integer>>(searchCityCount.entrySet());
227
228     // 2. Sort list with Collections.sort(), provide a custom Comparator
229     Collections.sort(list, new Comparator<Map.Entry<String, Integer>>() {
230         public int compare(Map.Entry<String, Integer> o1,
231                            Map.Entry<String, Integer> o2) {
232             return (o2.getValue()).compareTo(o1.getValue());
233         }
234     });
235
236     // 3. Loop the sorted list and put it into a new insertion order Map LinkedHashMap
237     Map<String, Integer> TopCity = new LinkedHashMap<String, Integer>();
238     for (Map.Entry<String, Integer> entry : list) {
239         TopCity.put(entry.getKey(), entry.getValue());
240     }
```

Dashboard - Logs & Log useful information

-------- Full Log --------

City	API Request Timestamp	API Response Timestamp	Success or not	Full Log
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Las Vegas	1668896100308	1668896101782	true	{"q":"Las Vegas","rid":"bb984ce93d69403f9b4e8c34680c27ea","rc":"OK","sr":[{"@type":"gaiaRegionResult","index":"0","gaiaId":"2008","type":"CITY","regionNames":{"fullName":"Las Vegas, Nevada, United States of America","shortName":"Las Vegas","displayName":"Las Vegas, Nevada, United States","primaryDisplayName":"Las Vegas","secondaryDisplayName":"Nevada, United States","lastSearchName":"Las Vegas"},"essId":{"sourceName":"GAI","sourceId":"2008"},"coordinates":{"lat":"36.17006","long":"-115.141376"},"hierarchyInfo":{"country":{"name":"United States","isoCode2":"US","isoCode3":"USA"}}},{"@type":"gaiaRegionResult","index":"1","gaiaId":"800045","type":"NEIGHBORHOOD","regionNames":{"fullName":"Las Vegas Strip, Paradise, Nevada, United States of America","shortName":"Las Vegas Strip","displayName":"Las Vegas Strip, Paradise, Nevada, United States","primaryDisplayName":"Las Vegas Strip","secondaryDisplayName":"Paradise, Nevada, United States","lastSearchName":"Las Vegas Strip"},"essId":{"sourceName":"GAI","sourceId":"800045"},"coordinates":{"lat":"36.114708","long":"-115.172852"},"hierarchyInfo":{"country":{"name":"United States","isoCode2":"US","isoCode3":"USA"}}},{"@type":"gaiaRegionResult","index":"2","gaiaId":"800047","type":"NEIGHBORHOOD","regionNames":{"fullName":"Downtown Las Vegas, Las Vegas, Nevada, United States of America","shortName":"Downtown Las Vegas","displayName":"Downtown Las Vegas, Las Vegas, Nevada, United States","primaryDisplayName":"Downtown Las Vegas","secondaryDisplayName":"Las Vegas, Nevada, United States","lastSearchName":"Downtown Las Vegas"},"essId":{"sourceName":"GAI","sourceId":"800047"},"coordinates":{"lat":"36.17046","long":"-115.14349"},"hierarchyInfo":{"country":{"name":"United States","isoCode2":"US","isoCode3":"USA"}}},{"@type":"gaiaRegionResult","index":"3","gaiaId":"5456204","type":"AIRPORT","regionNames":{"fullName":"Las Vegas, NV, United States of America (LAS-Harry Reid Intl.)","shortName":"Las Vegas, NV (LAS-Harry Reid Intl.)","displayName":"Las Vegas (LAS - 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East Elmhurst	1668978694559	1668978695609	true	{"lat":"40.758278","long":"-73.985493"},"hierarchyInfo":{"country":{"isoCode3":"USA"}},"cityId":"2621","hotelAddress":{"street":"1535 Broadway","city":"New York","province":"NY"}},{"@type":"gaiaHotelResult","index":"4","hotelId":"19768","type":"HOTEL","regionNames":{"fullName":"New York Hilton Midtown, New York, New York, United States of America","shortName":"New York Hilton Midtown","displayName":"New York Hilton Midtown, New York, New York, United States","primaryDisplayName":"New York Hilton Midtown","secondaryDisplayName":"New York, New York, United States","lastSearchName":"New York Hilton Midtown"},"essId":{"sourceName":"LCM","sourceId":"19768"},"coordinates":{"lat":"40.76225","long":"-73.97874"},"hierarchyInfo":{"country":{"isoCode3":"USA"}},"cityId":"2621","hotelAddress":{"street":"1335 Avenue Of The Americas","city":"New York","province":"NY"}},{"@type":"gaiaRegionResult","index":"5","gaiaId":"4933194","type":"AIRPORT","regionNames":{"fullName":"New York, NY, United States of America (JFK-John F. Kennedy Intl.)","shortName":"New York, NY (JFK-John F. Kennedy Intl.)","displayName":"New York (JFK – John F. Kennedy Intl.), New York, United States","primaryDisplayName":"New York (JFK – John F. Kennedy Intl.)","secondaryDisplayName":"New York, United States","lastSearchName":"New York (JFK – John F. Kennedy Intl.)"},"essId":{"sourceName":"GAI","sourceId":"4933194"},"coordinates":{"lat":"40.644166","long":"-73.782548"},"hierarchyInfo":{"country":{"name":"United States","isoCode2":"US","isoCode3":"USA"}},"isMinorAirport":"false"},{"@type":"gaiaRegionResult","index":"6","gaiaId":"6203489","type":"NEIGHBORHOOD","regionNames":{"fullName":"Midtown, New York, New York, United States of America","shortName":"Midtown","displayName":"Midtown, New York, New York, United States","primaryDisplayName":"Midtown","secondaryDisplayName":"New York, New York, United States","lastSearchName":"Midtown"},"essId":{"sourceName":"GAI","sourceId":"6203489"},"coordinates":{"lat":"40.7520567817666","long":"-73.9874924492131"},"hierarchyInfo":{"country":{"name":"United States","isoCode2":"US","isoCode3":"USA"}}},{"@type":"gaiaRegionResult","index":"7","gaiaId":"6234083","type":"MULTIREGION","subtype":"HLR","regionNames":{"fullName":"Upstate New York, New York, United States of America","shortName":"Upstate New York","displayName":"Upstate New York, New York, United States","primaryDisplayName":"Upstate New York","secondaryDisplayName":"New York, United States","lastSearchName":"Upstate New York"},"essId":{"sourceName":"GAI","sourceId":"6234083"},"coordinates":{"lat":"43.04737748563339","long":"-75.65465713202158"},"hierarchyInfo":{"country":{"name":"United States","isoCode2":"US","isoCode3":"USA"}}},{"@type":"gaiaHotelResult","index":"8","hotelId":"2896","type":"HOTEL","regionNames":{"fullName":"New York LaGuardia Airport Marriott, East Elmhurst, New York, United States of America","shortName":"New York LaGuardia Airport Marriott","displayName":"New York LaGuardia Airport Marriott, East Elmhurst, New York, United States","primaryDisplayName":"New York LaGuardia Airport Marriott","secondaryDisplayName":"East Elmhurst, New York, United States","lastSearchName":"New York LaGuardia Airport Marriott"},"essId":{"sourceName":"LCM","sourceId":"2896"},"coordinates":{"lat":"40.768417","long":"-73.867602"},"hierarchyInfo":{"country":{"isoCode3":"USA"}},"cityId":"55683","hotelAddress":{"street":"102-05 Ditmars Boulevard","city":"East Elmhurst","province":"NY"}},{"@type":"gaiaRegionResult","index":"9","gaiaId":"4278092","type":"AIRPORT","regionNames":{"fullName":"New York, NY, United States of America (LGA-LaGuardia)","shortName":"New York, NY (LGA-LaGuardia)","displayName":"New York (LGA – LaGuardia), New York, United States","primaryDisplayName":"New York (LGA – LaGuardia)","secondaryDisplayName":"New York, United States","lastSearchName":"New York (LGA – LaGuardia)"},"essId":{"sourceName":"GAI","sourceId":"4278092"},"coordinates":{"lat":"40.77429","long":"-73.872035"},"hierarchyInfo":{"country":{"name":"United States","isoCode2":"US","isoCode3":"USA"}},"isMinorAirport":"false"}]}
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Bar"},"essId":{"sourceName":"GAI","sourceId":"6131954"},"coordinates":{"lat":"53.345220035985385","long":"-6.264055245082909"},"hierarchyInfo":{"country":{"name":"Ireland","isoCode2":"IE","isoCode3":"IRL"}}},{"@type":"gaiaRegionResult","index":"9","gaiaId":"507659","type":"POI","regionNames":{"fullName":"Trinity College, Dublin, Ireland","shortName":"Trinity College","displayName":"Trinity College, Dublin, Ireland","primaryDisplayName":"Trinity College","secondaryDisplayName":"Dublin, Ireland","lastSearchName":"Trinity College"},"essId":{"sourceName":"GAI","sourceId":"507659"},"coordinates":{"lat":"53.34372436196781","long":"-6.254616603779868"},"hierarchyInfo":{"country":{"name":"Ireland","isoCode2":"IE","isoCode3":"IRL"}}}]}
Las Vegas	1668978709054	1668978709861	true	{"q":"Las Vegas","rid":"c29a044f7dc54cd6a512e943ef2e01b4","rc":"OK","sr":[{"@type":"gaiaRegionResult","index":"0","gaiaId":"2008","type":"CITY","regionNames":{"fullName":"Las Vegas, Nevada, United States of America","shortName":"Las Vegas","displayName":"Las Vegas, Nevada, United States","primaryDisplayName":"Las Vegas","secondaryDisplayName":"Nevada, United States","lastSearchName":"Las Vegas"},"essId":{"sourceName":"GAI","sourceId":"2008"},"coordinates":{"lat":"36.17006","long":"-115.141376"},"hierarchyInfo":{"country":{"name":"United States","isoCode2":"US","isoCode3":"USA"}}},{"@type":"gaiaRegionResult","index":"1","gaiaId":"800045","type":"NEIGHBORHOOD","regionNames":{"fullName":"Las Vegas Strip, Paradise, Nevada, United States of America","shortName":"Las Vegas Strip","displayName":"Las Vegas Strip, Paradise, Nevada, United States","primaryDisplayName":"Las Vegas Strip","secondaryDisplayName":"Paradise, Nevada, United 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Vegas"},"essId":{"sourceName":"GAI","sourceId":"9169"},"coordinates":{"lat":"36.19934","long":"-115.11898"},"hierarchyInfo":{"country":{"name":"United States","isoCode2":"US","isoCode3":"USA"}}},{"@type":"gaiaHotelResult","index":"8","hotelId":"2565776","type":"HOTEL","regionNames":{"fullName":"ARIA Resort & Casino, Las Vegas, Nevada, United States of America","shortName":"ARIA Resort & Casino","displayName":"ARIA Resort & Casino, Las Vegas, Nevada, United States","primaryDisplayName":"ARIA Resort & Casino","secondaryDisplayName":"Las Vegas, Nevada, United States","lastSearchName":"ARIA Resort & Casino"},"essId":{"sourceName":"LCM","sourceId":"2565776"},"coordinates":{"lat":"36.106701","long":"-115.173205"},"hierarchyInfo":{"country":{"isoCode3":"USA"}},"cityId":"2008","hotelAddress":{"street":"3730 Las Vegas Blvd. South","city":"Las Vegas","province":"NV"}},{"@type":"gaiaHotelResult","index":"9","hotelId":"1443","type":"HOTEL","regionNames":{"fullName":"The Venetian Resort Las Vegas, Las Vegas, Nevada, United States of America","shortName":"The Venetian Resort Las Vegas","displayName":"The Venetian Resort Las Vegas, Las Vegas, Nevada, United States","primaryDisplayName":"The Venetian Resort Las Vegas","secondaryDisplayName":"Las Vegas, Nevada, United States","lastSearchName":"The Venetian Resort Las Vegas"},"essId":

HotelModel.java × | index.jsp × | HotelServlet.java × | HotelData.java ×

```java
if(request.getRequestURI().contains("getHotel")){
    String res = null;

    // get the search parameter if it exists
    String search = request.getParameter( name: "searchWord");
    System.out.println(search);

    res = hm.callAPI(search);
    System.out.println(res);
    //response.setContentType("text/html");

    // Hello
    PrintWriter out = response.getWriter();
    response.setContentType("application/json");
    response.setCharacterEncoding("UTF-8");
    out.println(res);
    out.flush();
}
// else get to the index page
else{
    ArrayList<ArrayList<String>> readMongoDB = hm.readMongoDB();
    ArrayList<String> searchLatency = hm.getSearchLatency();
    String avg_latency = hm.getAverageLatency();
    Map<String, Integer> topCity = hm.getTopSearch();

    request.setAttribute( name: "database", readMongoDB);
    request.setAttribute( name: "searchLatency", searchLatency);
    request.setAttribute( name: "avg_latency", avg_latency);
    request.setAttribute( name: "topCity", topCity);

    nextView = "index.jsp";
    // Transfer control over the correct "view"
    RequestDispatcher view = request.getRequestDispatcher(nextView);
    view.forward(request, response);
```

Store the log information in a database – MongoDB

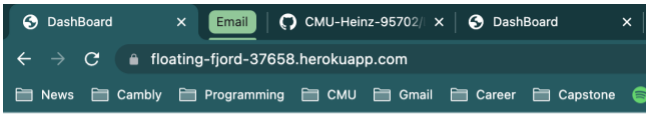
HotelModel.java | index.jsp | HotelServlet.java | HotelData.java

2 usages

```
public static void callMongoDB(String city, String fullLog, long apiCallTimeStamp, long apiResponseTimestamp, boolean isSuccess){

    ConnectionString connectionString = new ConnectionString("mongodb+srv://DSProject:DSProject123@cluster0.kbrdo.mongodb.net/?retryWrites=true&w=majo
    MongoClientSettings settings = MongoClientSettings.builder()
            .applyConnectionString(connectionString)
            .serverApi(ServerApi.builder()
                    .version(ServerApiVersion.V1)
                    .build())
            .build();
    MongoClient mongoClient = MongoClients.create(settings);
    MongoDatabase database = mongoClient.getDatabase( s: "DS");
    MongoCollection<Document> collection = database.getCollection( s: "HotelData");

    String content = String.format("city: %s, apiCallTimeStamp: %d, apiResponseTimestamp: %d, isSuccess: %b", city,
            apiCallTimeStamp, apiResponseTimestamp, isSuccess);

    // Taken from MongoDB Docs
    // https://www.mongodb.com/docs/drivers/java/sync/v4.3/usage-examples/insertOne/
    try {
        System.out.println("Write to MongoDB: " + content);
        InsertOneResult result = collection.insertOne(new Document()
                .append("_id", new ObjectId())
                .append("city", city)
                .append("fullLog", fullLog)
                .append("apiCallTimeStamp", apiCallTimeStamp)
                .append("apiResponseTimestamp", apiResponseTimestamp)
                .append("isSuccess", isSuccess));
        System.out.println("Success! New Document ID: " + result.getInsertedId());
    } catch (MongoException me) {
        System.err.println("Unable to insert due to an error: " + me);
    }
}
```

```
public ArrayList<ArrayList<String>> readMongoDB(){

    ConnectionString connectionString = new ConnectionString("mongodb+srv://DSProject:DSProject123@cluster0.kbrdo.mongodb.net/?retryWrites=true&w=ma
    MongoClientSettings settings = MongoClientSettings.builder()
            .applyConnectionString(connectionString)
            .serverApi(ServerApi.builder()
                    .version(ServerApiVersion.V1)
                    .build())
            .build();
    MongoClient mongoClient = MongoClients.create(settings);
    MongoDatabase database = mongoClient.getDatabase( s: "DS");

    MongoCollection<Document> collection = database.getCollection( s: "HotelData");
    MongoCursor<Document> docIterator = collection.find().iterator();

    if (docIterator.hasNext()) {
        System.out.println("Reading and printing all strings contained in the documents to the console:");
        StringJoiner sj = new StringJoiner( delimiter: "\n");
        ArrayList<ArrayList<String>> mongoDB_data = new ArrayList<ArrayList<String>>();



        while(docIterator.hasNext()) {
            Document doc = docIterator.next();
            // for each row
            ArrayList<String> mongo_DB_element = new ArrayList<>();
            mongo_DB_element.add(doc.getString( key: "city"));
            mongo_DB_element.add(doc.getString( key: "fullLog"));
            mongo_DB_element.add(doc.getLong( key: "apiCallTimeStamp").toString());
            mongo_DB_element.add(doc.getLong( key: "apiResponseTimestamp").toString());
            mongo_DB_element.add(String.valueOf(doc.getBoolean( key: "isSuccess")));
            // append to the full database
            mongoDB_data.add(mongo_DB_element);
        }
```

Display operations analytics and full logs on a web-based dashboard



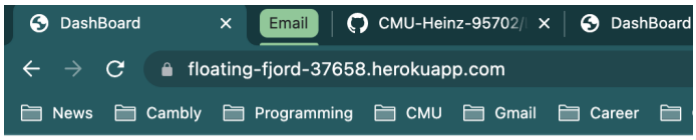
DashBoard

------- Analysis 1 -------

Top City	Search Count
Taipei	12
	8
East Elmhurst	6
Roissy-en-France	4
Las Vegas	2
Pittsburgh	2
Kathmandu	1
Dublin	1
Hayes	1
Taichung	1
Boston	1

------- Analysis 2 -------

Query #	Search Time (in second)
1	1
2	1
3	1
4	14
5	1
6	1
7	1
8	0
9	0
10	2
11	1
12	1
13	1
14	0
15	0
16	0
17	1
18	1
19	1
20	1
21	1
22	2
23	1
24	1
25	1



26	1
27	0
28	0
29	1
30	1
31	1
32	1
33	1
34	1
35	1
36	1
37	1
38	1
39	1

------- Analysis 3 -------

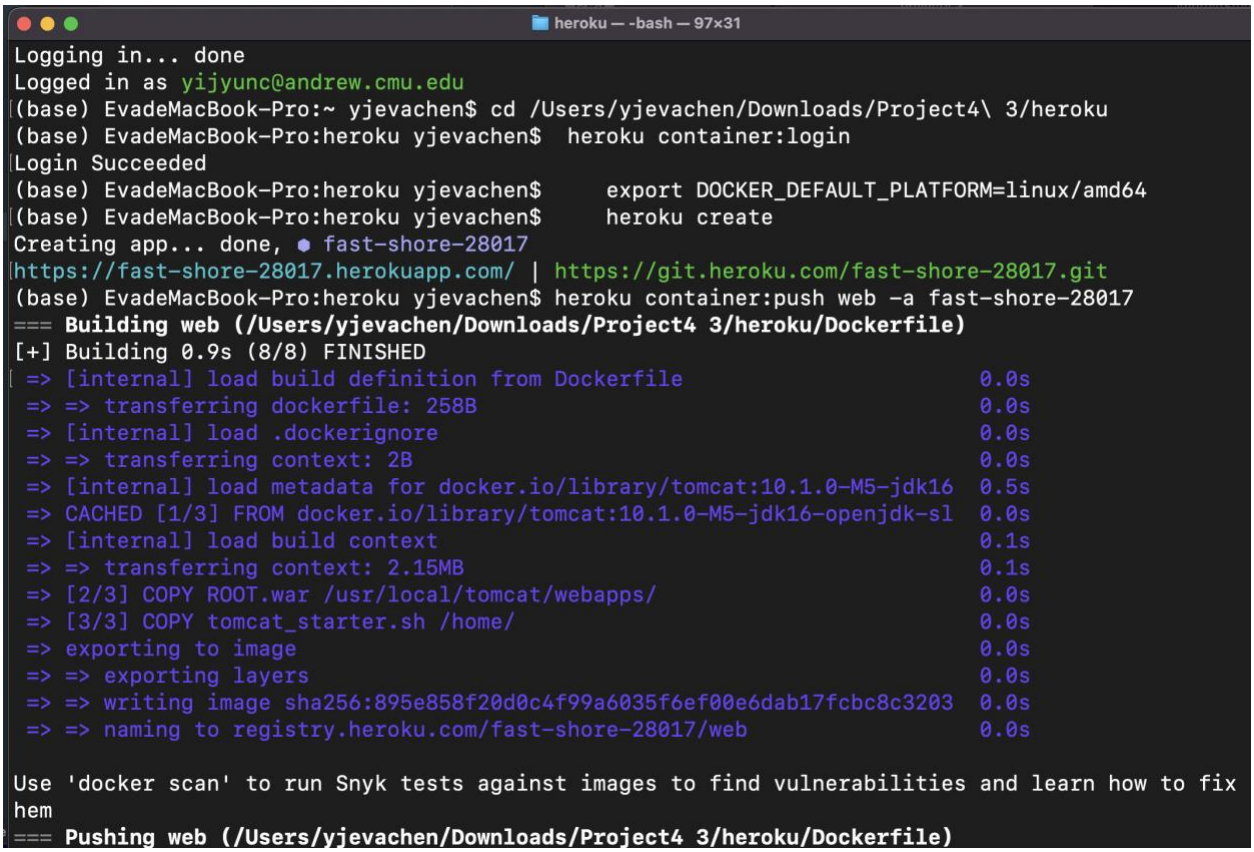
Average Latency of Search: 1

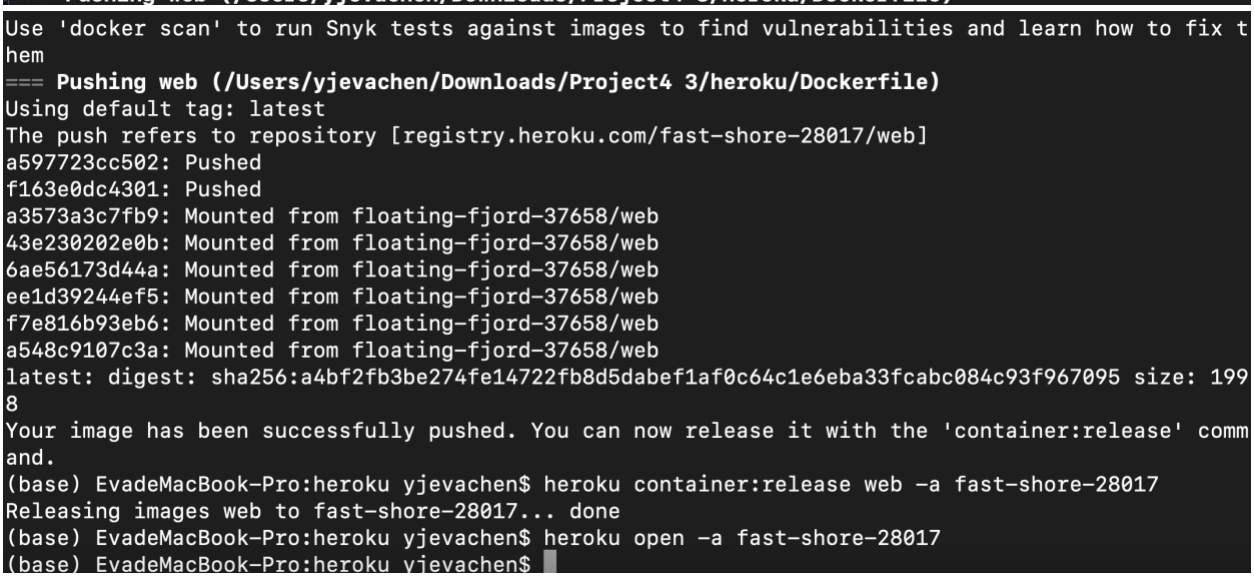
Deploy the web service to Heroku

Link to Heroku: https://fast-shore-28017.herokuapp.com/

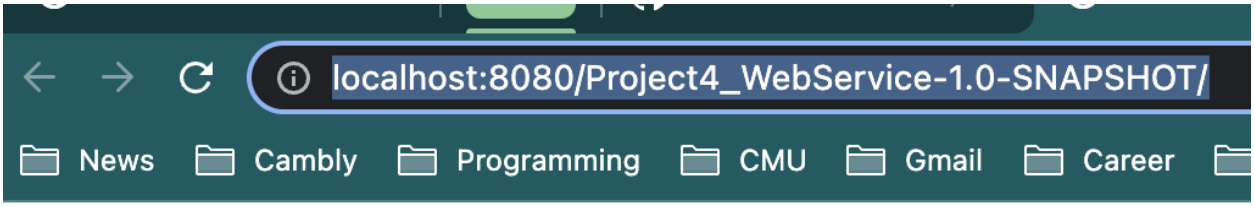
(fixed some minor errors, the link to Heroku screened shot above may be difference, Please use the updated link above as latest correct version)

Link on localhost: http://localhost:8080/Project4_WebService-1.0-SNAPSHOT/

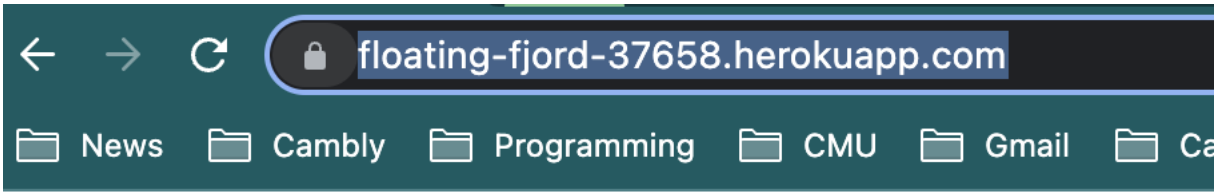




Start from localhost

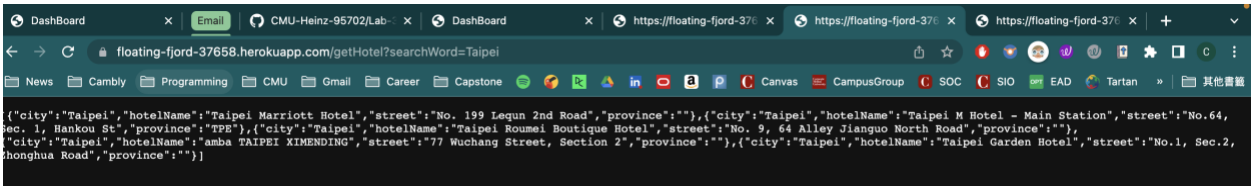


Deploy to Heroku

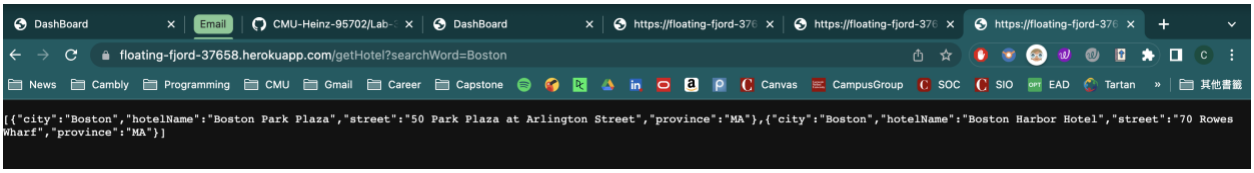


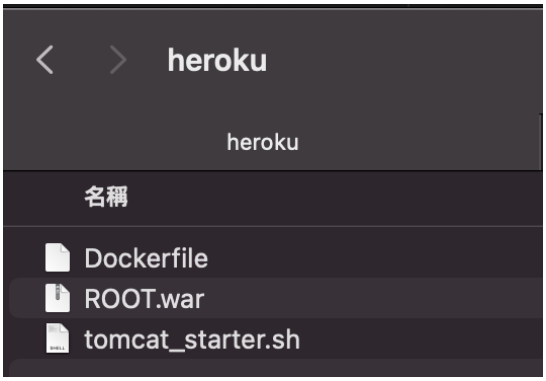
Some example search (of hotels in cities) with Heroku

Taipei



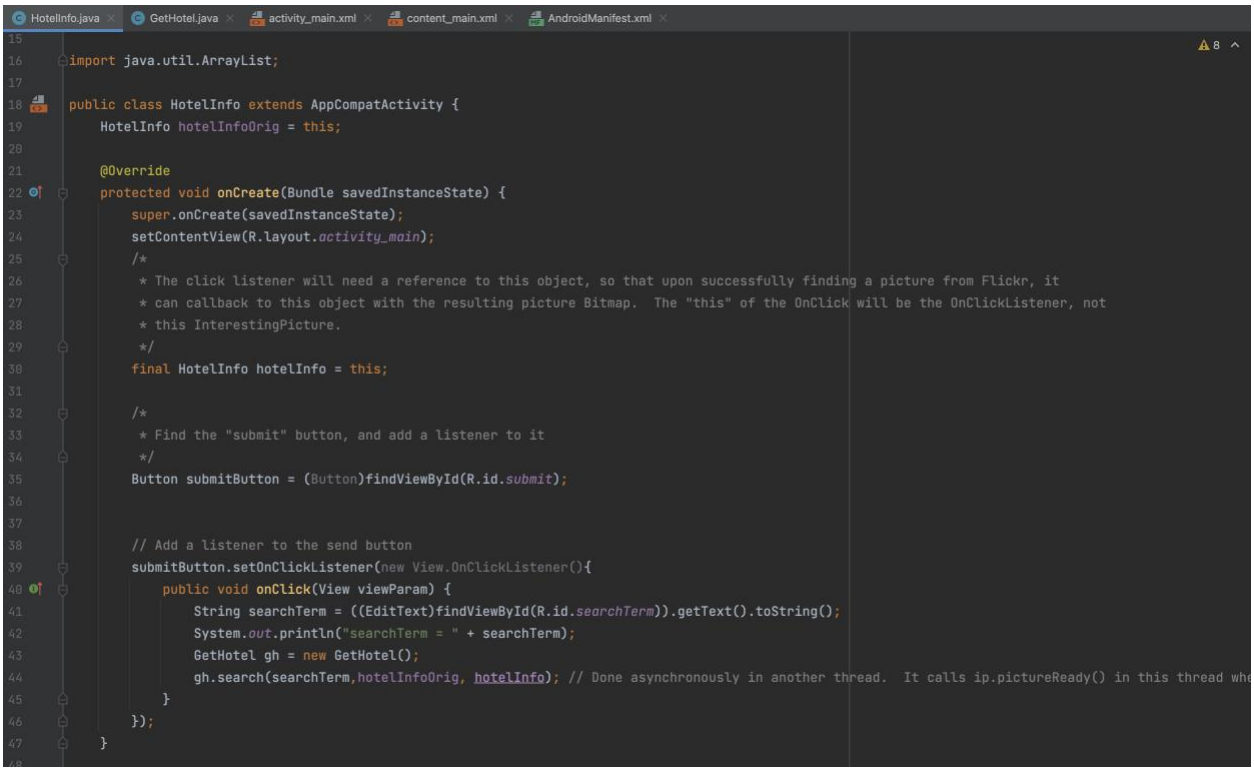
Boston



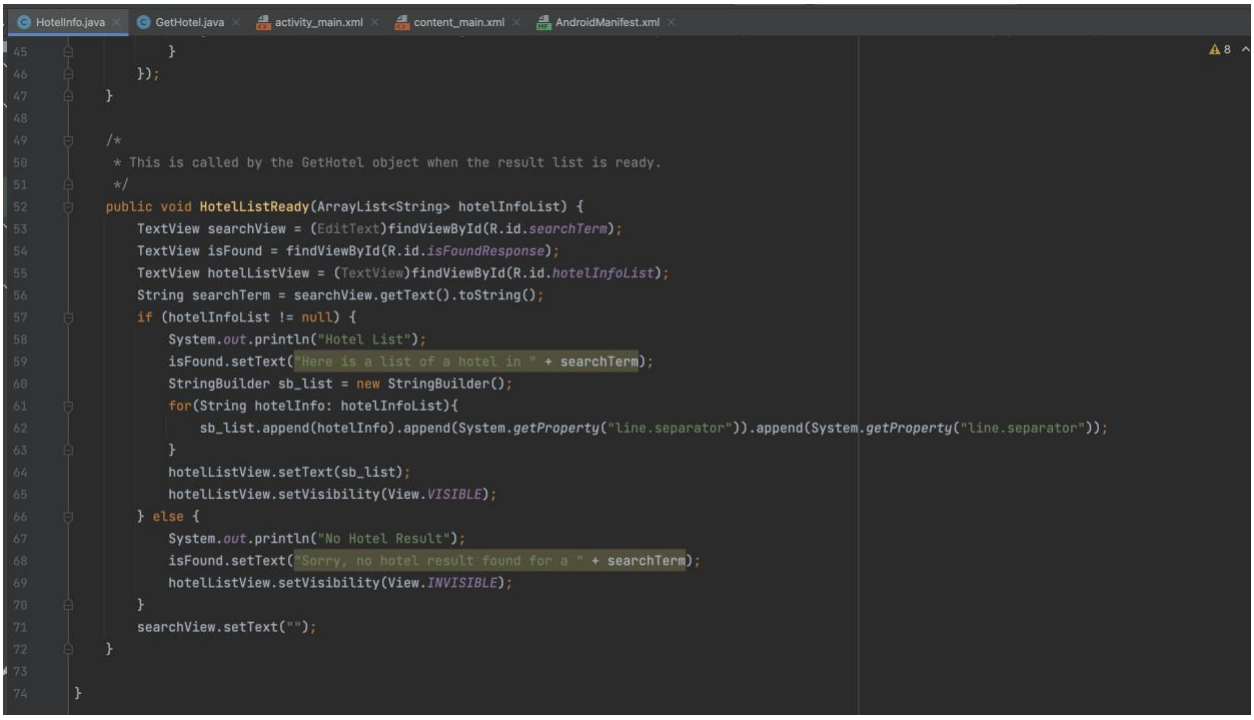


Implement a native Android application

HotelInfo.java (Main)



```
import java.util.ArrayList;

public class HotelInfo extends AppCompatActivity {
    HotelInfo hotelInfoOrig = this;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        /*
         * The click listener will need a reference to this object, so that upon successfully finding a picture from Flickr, it
         * can callback to this object with the resulting picture Bitmap.  The "this" of the OnClick will be the OnClickListener, not
         * this InterestingPicture.
         */
        final HotelInfo hotelInfo = this;

        /*
         * Find the "submit" button, and add a listener to it
         */
        Button submitButton = (Button)findViewById(R.id.submit);


        // Add a listener to the send button
        submitButton.setOnClickListener(new View.OnClickListener(){
            public void onClick(View viewParam) {
                String searchTerm = ((EditText)findViewById(R.id.searchTerm)).getText().toString();
                System.out.println("searchTerm = " + searchTerm);
                GetHotel gh = new GetHotel();
                gh.search(searchTerm,hotelInfoOrig, hotelInfo); // Done asynchronously in another thread.  It calls ip.pictureReady() in this thread wh
            }
        });
    }
```



```
            }
        });
    }

    /*
     * This is called by the GetHotel object when the result list is ready.
     */
    public void HotelListReady(ArrayList<String> hotelInfoList) {
        TextView searchView = (EditText)findViewById(R.id.searchTerm);
        TextView isFound = findViewById(R.id.isFoundResponse);
        TextView hotelListView = (TextView)findViewById(R.id.hotelInfoList);
        String searchTerm = searchView.getText().toString();
        if (hotelInfoList != null) {
            System.out.println("Hotel List");
            isFound.setText("Here is a list of a hotel in " + searchTerm);
            StringBuilder sb_list = new StringBuilder();
            for(String hotelInfo: hotelInfoList){
                sb_list.append(hotelInfo).append(System.getProperty("line.separator")).append(System.getProperty("line.separator"));
            }
            hotelListView.setText(sb_list);
            hotelListView.setVisibility(View.VISIBLE);
        } else {
            System.out.println("No Hotel Result");
            isFound.setText("Sorry, no hotel result found for a " + searchTerm);
            hotelListView.setVisibility(View.INVISIBLE);
        }
        searchView.setText("");
    }

}
```

GetHotel.java

HotelInfo.java | GetHotel.java | activity_main.xml | content_main.xml | AndroidManifest.xml

```
21
22      //Initialize variables
23      HotelInfo hotelInfo = null;   // for callback
24      String searchTerm = null;       // search hotel for this city
25      ArrayList<String> hotelInfoList;
26
27      // search()
28      // String searchTerm: the thing to search for on flickr
29      // Activity activity: the UI thread activity
30      public void search(String searchTerm, Activity activity, HotelInfo hotelInfo) {
31          this.hotelInfo = hotelInfo;
32          this.searchTerm = searchTerm;
33          new BackgroundTask(activity).execute();
34      }
```

```
private class BackgroundTask {

    private Activity activity; // The UI thread

    public BackgroundTask(Activity activity) { this.activity = activity; }

    private void startBackground() {
        new Thread(new Runnable() {
            public void run() {

                try {
                    doInBackground();
                } catch (JSONException e) {
                    e.printStackTrace();
                } catch (IOException e) {
                    e.printStackTrace();
                }
                // This is magic: activity should be set to MainActivity.this
                //    then this method uses the UI thread
                activity.runOnUiThread(new Runnable() {
                    public void run() { onPostExecute(); }
                });
            }
        }).start();
    }
```

```
    private void execute() {
        // There could be more setup here, which is why
        //    startBackground is not called directly
        startBackground();
    }

    // doInBackground( ) implements whatever you need to do on
    //    the background thread.
    // Implement this method to suit your needs
    private void doInBackground() throws JSONException, IOException {
        hotelInfoList = search(searchTerm);
    }

    // onPostExecute( ) will run on the UI thread after the background
    //    thread completes.
    // Implement this method to suit your needs
    public void onPostExecute() { hotelInfo.HotelListReady(hotelInfoList); }
```

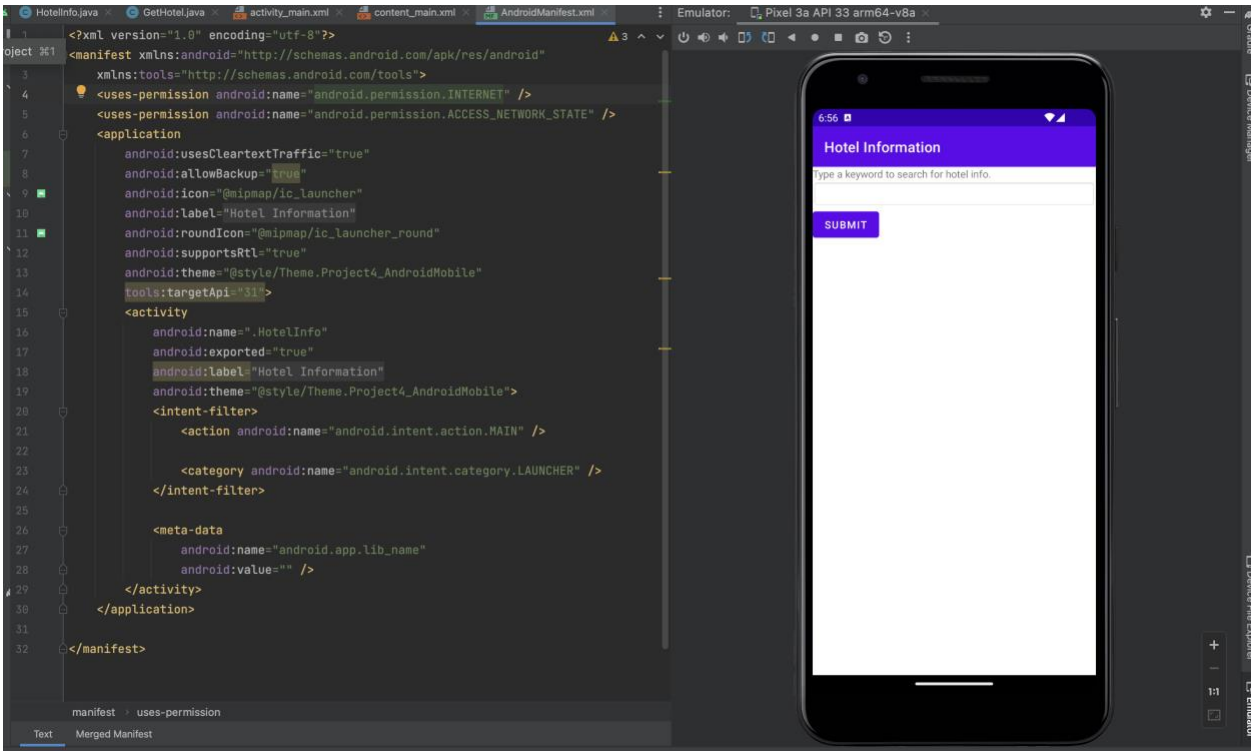
```
HotelInfo.java | GetHotel.java | activity_main.xml | content_main.xml | AndroidManifest.xml
*/
private ArrayList<String> search(String searchTerm) throws IOException, JSONException {
    hotelInfoList = new ArrayList<>();
    String jsonGet = "";
    String hotelBaseURL = "https://floating-fjord-37658.herokuapp.com/";
    //http://localhost:8080/Project4_WebService-1.0-SNAPSHOT/getHotel?searchWord=pittsburgh
    URL url = new URL( spec: hotelBaseURL + "getHotel?searchWord=" + searchTerm.replaceAll( regex: " ", replacement: "%20"));
    //Basic URL formatting
    //reference https://www.tabnine.com/code/java/methods/java.net.HttpURLConnection/setRequestMethod
    HttpURLConnection connect = (HttpURLConnection) url.openConnection();
    connect.setRequestMethod("GET");
    if (connect.getResponseCode() == 200) {
        InputStreamReader reader = new InputStreamReader(connect.getInputStream());
        BufferedReader br = new BufferedReader(reader);
        String line = "";

        while ((line = br.readLine()) != null) {
            jsonGet = jsonGet + line;
        }
        // reference https://stackoverflow.com/questions/22461663/convert-inputstream-to-jsonobject
        JSONArray jsonObject = new JSONArray(jsonGet);
        // reference https://stackoverflow.com/questions/58480521/how-to-count-json-object-item
        // looping through All Selections
        int totalCityHotel = jsonObject.length();
        System.out.println((totalCityHotel));

        for(int i=0; i<totalCityHotel; i++){
            String hotelName = jsonObject.getJSONObject(i).get("hotelName").toString();
            String street = jsonObject.getJSONObject(i).get("street").toString();
            String province = jsonObject.getJSONObject(i).get("province").toString();

            StringBuilder sb = new StringBuilder();
            sb.append("Hotel Name: ").append(hotelName).append(System.getProperty("line.separator")).append("Street: ").append(street).append(Syste
            System.out.println(sb.toString());
```

Conent_main.xml – using 3+ Views

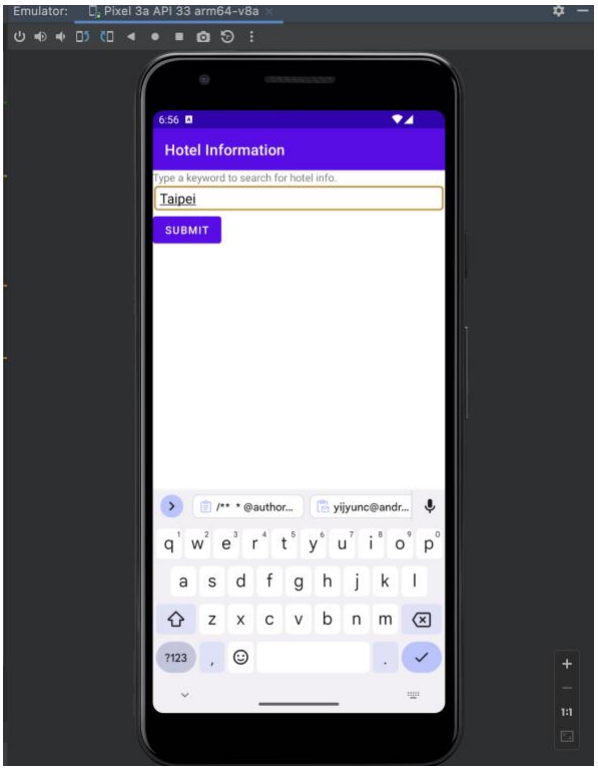
```
HotelInfo.java | GetHotel.java | activity_main.xml | content_main.xml | AndroidManifest.xml
Code | Split | Desig
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent">

    <TextView android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Type a keyword to search for hotel info." />


    <EditText
        android:id="@+id/searchTerm"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:background="@android:drawable/editbox_background"
        android:singleLine="true"
        android:textColor="#000" />
    <Button
        android:text="Submit"
        android:id="@+id/submit"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        />

    <TextView
        android:id="@+id/isFoundResponse"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

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

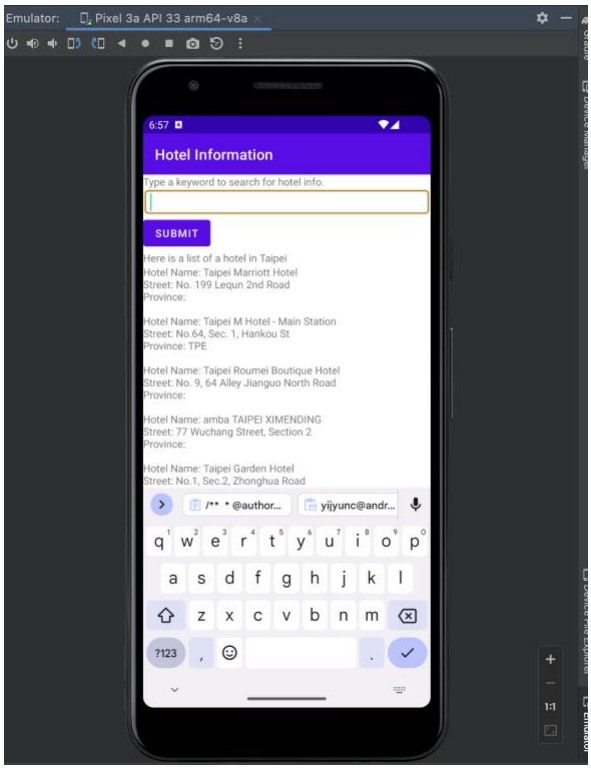
Demo of searching with App

Initial View

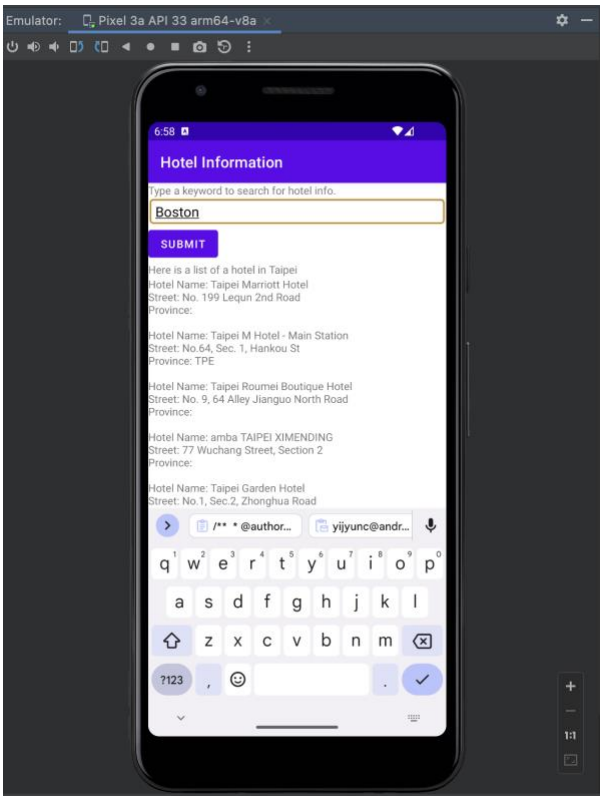


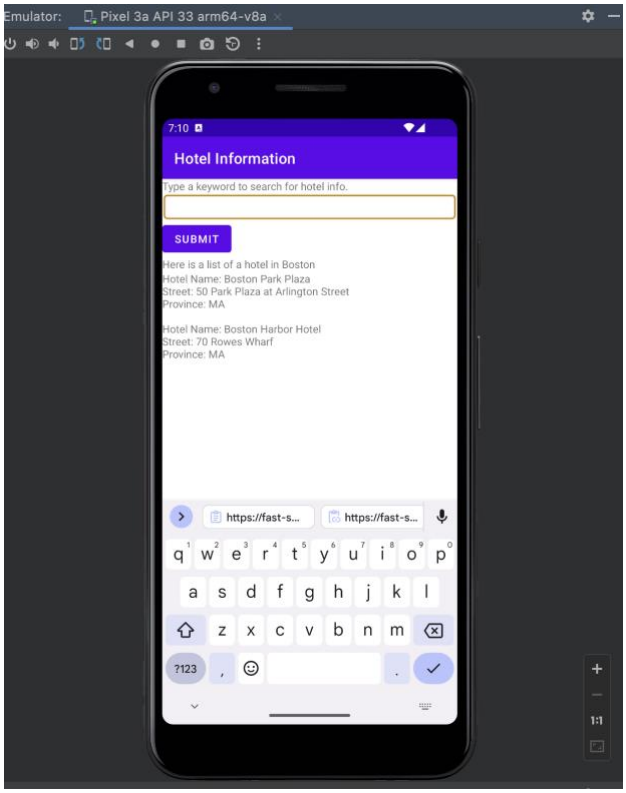
Search for hotels in Taipei:





Support continuous search – searching for hotels in Boston after the result of Taipei hotels





No result found