**SDK Plan**

First Step: Model the data. List API URLS and return data. Using this return data create a model.

API Doc for current weather: <http://openweathermap.org/current>

USE CITY ID WHEN POSSIBLE

**Call current weather data for one location by geographic coordinates:**

<http://api.openweathermap.org/data/2.5/weather?lat=USER_DEFINED_LATITUDE&lon=USER_DEFINED_LONGITUDE&appid=USER_DEFINED_APP_ID>

http://api.openweathermap.org/data/2.5/weather?id= CITY\_ID &appid= USER\_DEFINED\_APP\_ID

**Call current weather data for several cities:**

[http://api.openweathermap.org/data/2.5/box/city?bbox=12,32,15,37,10&cluster=yes](http://api.openweathermap.org/data/2.5/box/city?bbox=12,32,15,37,10&cluster=yes&appid=b1b15e88fa797225412429c1c50c122a)

[http://api.openweathermap.org/data/2.5/group?id=CITY\_ID, CITY\_ID, CITY\_ID &units=metric](http://api.openweathermap.org/data/2.5/group?id=CITY_ID,%20CITY_ID,%20CITY_ID%20&units=metric)

**bbox** bounding box [lon-left,lat-bottom,lon-right,lat-top]

**cluster** use server clustering of points. Possible values ​​are [yes, no]

Response Format:

Parameters:

* coord
  + coord.lon City geo location, longitude
  + coord.lat City geo location, latitude
* weather (more info Weather condition codes)
  + weather.id Weather condition id
  + weather.main Group of weather parameters (Rain, Snow, Extreme etc.)
  + weather.description Weather condition within the group
  + weather.icon Weather icon id
* base Internal parameter
* main
  + main.temp Temperature. Unit Default: Kelvin, Metric: Celsius, Imperial: Fahrenheit.
  + main.pressure Atmospheric pressure (on the sea level, if there is no sea\_level or grnd\_level data), hPa
  + main.humidity Humidity, %
  + main.temp\_min Minimum temperature at the moment. This is deviation from current temp that is possible for large cities and megalopolises geographically expanded (use these parameter optionally). Unit Default: Kelvin, Metric: Celsius, Imperial: Fahrenheit.
  + main.temp\_max Maximum temperature at the moment. This is deviation from current temp that is possible for large cities and megalopolises geographically expanded (use these parameter optionally). Unit Default: Kelvin, Metric: Celsius, Imperial: Fahrenheit.
  + main.sea\_level Atmospheric pressure on the sea level, hPa
  + main.grnd\_level Atmospheric pressure on the ground level, hPa
* wind
  + wind.speed Wind speed. Unit Default: meter/sec, Metric: meter/sec, Imperial: miles/hour.
  + wind.deg Wind direction, degrees (meteorological)
* clouds
  + clouds.all Cloudiness, %
* rain
  + rain.3h Rain volume for the last 3 hours
* snow
  + snow.3h Snow volume for the last 3 hours
* dt Time of data calculation, unix, UTC
* sys
  + sys.type Internal parameter
  + sys.id Internal parameter
  + sys.message Internal parameter
  + sys.country Country code (GB, JP etc.)
  + sys.sunrise Sunrise time, unix, UTC
  + sys.sunset Sunset time, unix, UTC
* id City ID
* name City name
* cod Internal parameter

API Doc for 5 day/ 3 hour forecast data: <http://openweathermap.org/forecast5>

Accepts city id and coordinates:

http://api.openweathermap.org/data/2.5/forecast?id=CITY\_ID&appid=APP\_ID

<http://api.openweathermap.org/data/2.5/forecast?lat=LATITUDE&lon=LONGITUDE>

##### Parameters:

* code Internal parameter
* message Internal parameter
* city
  + city.id City ID
  + city.name City name
  + city.coord
    - city.coord.lat City geo location, latitude
    - city.coord.lon City geo location, longitude
  + city.country Country code (GB, JP etc.)
* cnt Number of lines returned by this API call
* list
  + list.dt Time of data forecasted, unix, UTC
  + list.main
    - list.main.temp Temperature. Unit Default: Kelvin, Metric: Celsius, Imperial: Fahrenheit.
    - list.main.temp\_min Minimum temperature at the moment of calculation. This is deviation from 'temp' that is possible for large cities and megalopolises geographically expanded (use these parameter optionally). Unit Default: Kelvin, Metric: Celsius, Imperial: Fahrenheit.
    - list.main.temp\_max Maximum temperature at the moment of calculation. This is deviation from 'temp' that is possible for large cities and megalopolises geographically expanded (use these parameter optionally). Unit Default: Kelvin, Metric: Celsius, Imperial: Fahrenheit.
    - list.main.pressure Atmospheric pressure on the sea level by default, hPa
    - list.main.sea\_level Atmospheric pressure on the sea level, hPa
    - list.main.grnd\_level Atmospheric pressure on the ground level, hPa
    - list.main.humidity Humidity, %
    - list.main.temp\_kf Internal parameter
  + list.weather (more info Weather condition codes)
    - list.weather.id Weather condition id
    - list.weather.main Group of weather parameters (Rain, Snow, Extreme etc.)
    - list.weather.description Weather condition within the group
    - list.weather.icon Weather icon id
  + list.clouds
    - list.clouds.all Cloudiness, %
  + list.wind
    - list.wind.speed Wind speed. Unit Default: meter/sec, Metric: meter/sec, Imperial: miles/hour.
    - list.wind.deg Wind direction, degrees (meteorological)
  + list.rain
    - list.rain.3h Rain volume for last 3 hours, mm
  + list.snow
    - list.snow.3h Snow volume for last 3 hours
  + list.dt\_txt Data/time of caluclation, UTC

### **Units format**

##### Description:

Standard, metric, and imperial units are available.

##### Parameters:

**units** metric, imperial. When you do not use units parameter, format is Standard by default.

Temperature is available in Fahrenheit, Celsius and Kelvin units.

* For temperature in Fahrenheit use units=imperial
* For temperature in Celsius use units=metric
* Temperature in Kelvin is used by default, no need to use units parameter in API call

List of all API parameters with units [openweathermap.org/weather-data](http://openweathermap.org/weather-data)

##### Examples of API calls:

standard [api.openweathermap.org/data/2.5/find?q=London](http://api.openweathermap.org/data/2.5/find?q=London&appid=b1b15e88fa797225412429c1c50c122a)

metric [api.openweathermap.org/data/2.5/find?q=London&units=metric](http://api.openweathermap.org/data/2.5/find?q=London&units=metric&appid=b1b15e88fa797225412429c1c50c122a)

imperial [api.openweathermap.org/data/2.5/find?q=London&units=imperial](http://api.openweathermap.org/data/2.5/find?q=London&units=imperial&appid=b1b15e88fa797225412429c1c50c122a)

### **Multilingual support**

##### Description:

You can use lang parameter to get the output in your language. We support the following languages that you can use with the corresponded lang values: English - en, Russian - ru, Italian - it, Spanish - es (or sp), Ukrainian - uk (or ua), German - de, Portuguese - pt, Romanian - ro, Polish - pl, Finnish - fi, Dutch - nl, French - fr, Bulgarian - bg, Swedish - sv (or se), Chinese Traditional - zh\_tw, Chinese Simplified - zh (or zh\_cn), Turkish - tr, Croatian - hr, Catalan - ca

##### API call:

http://api.openweathermap.org/data/2.5/forecast/daily?id=524901&lang={lang}

##### Parameters:

**lang** language code

##### Examples of API calls:

[http://api.openweathermap.org/data/2.5/forecast/daily?id=524901&lang=zh\_cn](http://api.openweathermap.org/data/2.5/forecast/daily?id=524901&lang=zh_cn&appid=b1b15e88fa797225412429c1c50c122a)

Map: The OpenWeatherMap solution has a map overlay option but it doesn’t seem to be worth the effort to incorporate given the time limit. As such, I will use a simple annotated map for the time being.

Creating a model.

City Table:

* longitude – integer
* latitude – integer
* cityId – long
* cityName – string
* cityOrder – integer (user definable)

Weather Table

* title – string
* description – string
* temperature - float
* pressure - integer
* humidity - integer
* minimum\_temperature - float
* maximum\_temperature - float
* sea\_level - float
* ground\_level - float
* wind\_speed - float
* wind\_direction - integer
* cloudiness - integerlopu
* rain\_volume - float
* snow\_volume - float
* weather\_time - long
* city\_id – foreign key

**Second step**: Create this model in code. WeatherDB

**Third step**: Create classes for location and weather. Location, Weather

**Fourth Step**: Create class for making api calls and storing results into database. OpenWeatherMap

Basics of the OpenWeatherMap API Class:

Should make calls for:

**current weather**

**Single City Current Weather**

<http://api.openweathermap.org/data/2.5/weather?lat=USER_DEFINED_LATITUDE&lon=USER_DEFINED_LONGITUDE&appid=USER_DEFINED_APP_ID>

http://api.openweathermap.org/data/2.5/weather?id= CITY\_ID &appid= USER\_DEFINED\_APP\_ID

**Multiple City Current Weather**

[http://api.openweathermap.org/data/2.5/box/city?bbox=12,32,15,37,10&cluster=yes](http://api.openweathermap.org/data/2.5/box/city?bbox=12,32,15,37,10&cluster=yes&appid=b1b15e88fa797225412429c1c50c122a)

[http://api.openweathermap.org/data/2.5/group?id=CITY\_ID, CITY\_ID, CITY\_ID &units=metric](http://api.openweathermap.org/data/2.5/group?id=CITY_ID,%20CITY_ID,%20CITY_ID%20&units=metric)

**Single City Forecasts**

http://api.openweathermap.org/data/2.5/forecast?id=CITY\_ID&appid=APP\_ID

<http://api.openweathermap.org/data/2.5/forecast?lat=LATITUDE&lon=LONGITUDE>

Inputs for this class are APP\_ID and LONGITUDE, LATITUDE. The first call to a new city will be a lat, long call. Subsequent calls should use locationID if that is known.

**Fifth step**: Create the class responsible for scheduling API calls, interfacing with database class, and is the main class to be used by other applications. JDWeatherManager

Inputs:

* latitude and longitude for places
* app id
* api call interval time

Outputs:

* methods for retrieving locations
* methods for getting weather data for locations

How will this work?

External classes will need to initiate this class with a context. They are then responsible for setting the following values:

* Language (defaults to English)
* Units (defaults to metric)
* Update time (defaults to 3 hrs)
* Add any number of locations

They then tell the manager to start monitoring.

But the weather map will need most of this data right? True, so we will first make this an manager independent of a map. The next step will be to create the map view, that view will abstract this class (by detecting location). External applications can then choose to initiate their own Manager and implement their own map solution, or they may simply use the map we provide.

What will it do besides these things?

It will retrieve data via the OpenWeatherMap class, once it retrieves that data it will store it in the database via the database class. Before this it will pass this info through a delegate methods letting any observers use the data to update ui or perform other operations. Then every 15 minutes it will check the integrity of the database and delete old forecasts and update current weather. When an external application checks for weather data it will first check the database, if that information is not in the database then it will retrieve it.