GEOG 491/591 | ADVANCED GIS | SPRING 2015

Assignment 1 • Mapping Your Mobility Sensor Data

OBJECTIVE: Collect sensor-derived data from an app on your smart phone and create a map that displays your daily commute.

DESCRIPTION: In this lab you will create a map on how you commute in your daily life. You will be required to download a mobile app called RunKeeper and learn how to use it. You will use the app to track and collect data on your daily commute. You will then explore the RunKeeper developer's console and generate your activity data. This data will be converted to file formats called GeoJSON and CSV in order to visualize the spatial patterns of your daily commute.

INSTRUCTIONS

PART 1: COLLECTING YOUR DATA

1. Download RunKeeper to your smart phone and sign up for an account. To start tracking your commute, go to the `Start` tab and tap on `Go Running` to begin tracking.

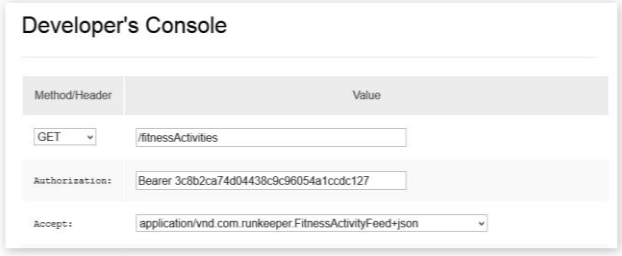
2. Once you are done with your commute, tap on `Stop` to stop tracking. You can view your tracked activities on the Feed or Profile section.

3. Explore the app interface. You can also go to the setting page and tailor the additional settings to your own preferences.

4. Note: Make sure that the length of your activities is varied. Later in this exercise, you will need to generate your activity data from RunKeeper's developer's console. Occasionally, activities that are way too long will lead to some technical issues. Due to this, we would like you to have a few shorter activities – perhaps a half a mile walk around campus – as a backup; just in case your 5-mile daily run happens to not work for this exercise!

PART 2: EXPLORING RUNKEEPER'S DEVELOPER'S CONSOLE

In this section, we will explore the developer's console and generate the raw data for the activities you have been tracking since the past week.

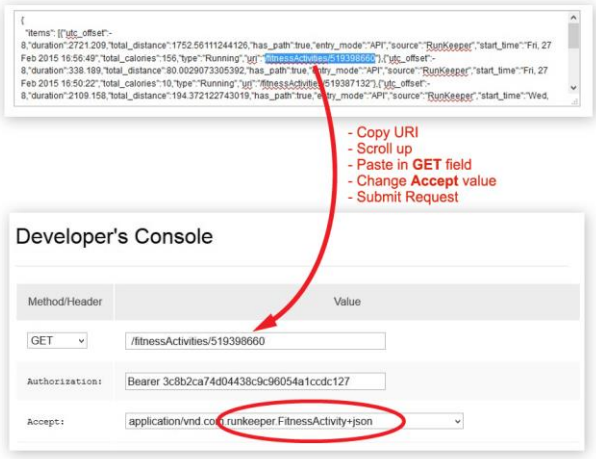


5. Go to RunKeeper's developer's console: http://developer.runkeeper.com/healthgraph/console. Click on **Connect to RunKeeper** and allow the authorization.

6. On the developer's console page, click on the first drop down menu and choose `GET`. Type in `/fitnessActivities` in the first field. For the **Accept** field, scroll down to the dropdown menu and choose `application/vnd.com.runkeeper.FitnessActivityFeed+json`. Leave other fields as they are. Look at the screenshot below for reference. Once you are done, click **Submit Request**.

7. Once the page is reloaded, scroll down the page until you see *HTTP/1.1 200 OK*. This message indicates that your request is successful. Now, scroll down more until you see a block of "script". This "script" is actually your activity data.

8. *fitnessActivitiesFeed* will not provide you with a full range of your activity data, but you will need to use some information from it (i.e. the URI) to generate a more complete dataset which you will get from *fitnessActivities*. Now, inspect your *fitnessActivitiesFeed* data and look for an element called "URI."



9. Choose any of the activities, copy the URI string (e.g. `/fitnessActivities/515019968`. Don't copy the quotes!), scroll up and paste the string in the GET field. Change the Accept field to `application/vnd.com.runkeeper.FitnessActivity+json`. Click **Submit Request**.

10. Once the page is reloaded, scroll down the page until you see a different block of code. This is the complete set of your fitness activity data. Copy the entire code and place it on your Wordpress website.

PART 3: INSPECTING YOUR ACTIVITY DATA

Section objective: *In this section, you will display your code on JSONLint and identify important elements and objects in the code.*

11. Open your browser and go to JSONLint: http://jsonlint.com. Copy and paste the code you just generated on the developer's console web page on the JSONLint console. Click **Validate**. Inspect the data and pay more attention on `path`, `distance` and `timestamp`.

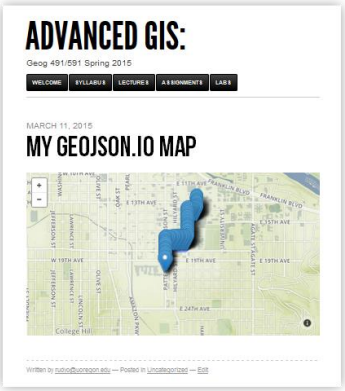
PART 4: CONVERTING YOUR DATA TO CSV AND GEOJSON

In this section, you will use a web-based application to convert your raw data to two different formats – CSV and GeoJSON. These formats will allow you to visualize the data on multiple platforms.

12. Go to the web app: https://ig-coho.uoregon.edu/runkeeper, click on Connect to RunKeeper and allow the authorization.

13. Click on `Download as CSV` and the website will generate your data in CSV format. Download the CSV file, save it and name it appropriately. Repeat the same step for GeoJSON but instead of downloading, you will see a page full of "script" – copy all of this "script" and paste it on Notepad.

PART 5: VISUALIZING YOUR DATA



In this section, you will use the GeoJSON file you just downloaded to display and interactively edit the data on an open source platform called geojson.io.

14. Go to geojson.io: http:/geojson.io. Empty the geojson.io panel by deleting all the existing lines. Make sure the </>JSON tab is activated.

15. Copy the GeoJSON script that you just got from step 13 and paste it in the geojson.io panel. Your map will be displayed on the central map.

16. geojson.io allows you to change the appearance of your points. Find the starting and ending points of your activity and try changing the point color to green and red respectively.

17. Take this opportunity to explore the tools and features on geojson.io. Be creative in visualizing your tracked activities. For example, you can add points to denote places with steep hills that you find challenging to walk/bike on. Or you might want to add lines to show your favorite running paths.

18. Once you are done creating your map, click `Share`, copy the iframe code and embed it in a page on your Wordpress website. You now have a web-based map of a transportation activity – generated by a sensor on your smartphone!

DELIVERABLE

The Assignment 1 page on your website should include the following:

1. The data from the developers console you pasted into your site from PART 2. Below the data provide 3-4 sentences reflecting on the ability to interact with your recorded activities and sensor data through the developer's console.	**5 POINTS**
2. The web map of your transportation activities from PART 5.	**5 POINTS**
3. In 3-4 sentences, explain the relationship between the three elements: path, distance and timestamp (see step 9 above).	**5 POINTS**
4. In 3-4 sentences, explain in laymen's terms the steps you took to collect and map the transportation data.	**5 POINTS**
5. In 3-4 sentences, explain the role that your GPS sensor played in collecting **trip data** and how useful this type of data can be for addressing transportation issues.	**5 POINTS**
TOTAL	**25 POINTS**

This exercise is due on **11:59 pm on Sunday April 12, 2015**.