

# Spatial analysis with ggmap

## Exercises (part-1)



R has many powerful libraries to handle spatial data, and the things that R can do with maps can only grow. This exercise tries to demonstrate a few basic functionalities of the ggmap package in R while dealing with raster images.

The ggmap package can be used to access maps from the Google Maps API and other APIs as raster layers and perform various raster operations on it. Moreover, many other features such as points, polygons, lines etc. can be added to the basemap using layered grammar of graphics on the lines of the ggplot2 package. In addition, the package provides Geocoding facilities using the popular Google API.

Answers to the exercises are available [here](#). If you obtained a different (correct) answer than those listed on the solutions page, please feel free to post your answer as a comment on that page.

Please install and load the package ggmap before starting the exercises.

### **Exercise 1**

Get a basemap for United Kingdom from Google Maps API and plot the map. Keep the zoom level in such a way that entire UK is visible in the map.

### **Exercise 2**

Repeat Exercise 1 to get a Stamen map for United Kingdom. Keep the mptype as toner.

### **Exercise 3**

Consider the following football clubs currently playing in the English Premier League, Arsenal FC, Manchester City FC, Manchester United FC, Liverpool FC, Chelsea FC and Tottenham Hotspur FC. Please locate these clubs on the basemap obtained in Exercise 1 as red points.

### **Exercise 4**

Consider the geolocation (-0.119543, 51.50332). Find out an address on the map that corresponds to this location..

### **Exercise 5**

Get a basemap for London from Google Maps API and plot it. Choose an appropriate Zoom Level.

### **Exercise 6**

Consider the following London based Football clubs: Arsenal FC, Tottenham Hotspur FC, Chelsea FC, West Ham FC and Crystal Palace FC. Like in Exercise 4, plot these clubs on the London map generated in Exercise 5. Use different colors and shape for each club.

### **Exercise 7**

Calculate the distance(while driving) from Emirates Stadium, London to Wembley, London in terms of kilometers and time taken (minutes).

### **Exercise 8**

Calculate the maximum zoom level which can be used to fetch a basemap such that both Emirates Stadium and Wembley are included in the map.

### **Exercise 9**

Get a basemap around Wembley at a zoom level 12 from Google Maps API. Keep the maptype as roadmap.

### **Exercise 10**

Draw the driving route from Emirates Stadium, London to

Wembley, London on the  
basemap obtained in Example 9. Keep the color of the route as  
red.