This homework assignment will follow up on the in-class group work you performed in class, but adds geographic information. You will need the data frame you created in Task 5 in the in-class assignment plus a new data set, coords.RData, that contains lat/long coordinates for 252 countries and can be downloaded above.

Perform the following steps and upload a .pdf of your .Rmd file by the due date.

1. Merge the data frame from Task 5 with `coords` via three different techniques: inner, right, and left merge. Compare the dimensions of each of the resulting data frame and explain any differences you see.

2. Suppose a researcher has a hypothesis that there is a relationship between gdp and distance from the equator, i.e. latitude. To explore this, the researcher would like to break the gdp into quartiles and then look at the mean latitude (in absolute value) for each quartile. To do this, perform the following tasks:

   a.) Using the data from the inner merge, use the `quantile()` function to determine the quartiles of gdp

   b.) Using the `findInterval()` function and your result from above, create a new factor variable in the data set called `gdp.q` based on the quartile that the a given observation's gdp value lies in. Print a table of the levels of this variable. Does your function seem to be working? How can you tell?

   c.) Reverse the order of the factor levels for gdp.q and reprint the table.

   d.) Find the mean latitude (in absolute value) for each quartile. Does there seem to be a difference?