QUESTION 1 **[6 marks]**

a. [*3 marks*] In our Wickham text, he does the following `join`.

> We can't map this data directly because it has no spati
> Instead, we must first join it to the vector boundaries dat
> particularly space efficient, but it makes it easy to see exactl
> being plotted. Here I use `dplyr::left_join()` to combine the tw
> create a choropleth map.

```
census_counties <- left_join(mi_census, mi_counties, by = c(
census_counties
#> Source: local data frame [1,472 x 8]
```

What is the author aiming to accomplish? How does this command effect this?

b. [*3 marks*] In our week 08 tutorial we created a map of GDP per capita. In doing so, we ran the following `join`.

> Now we merge the two sets of data:

```
merged <- full_join(dat_map, wdi,
                    by = "ccode")
```

What is this command aiming to accomplish? How does this command effect this?

QUESTION 2 **[9 marks]**

a. [*4 marks*] Create an attractive visualisation (using a map, perhaps?) of the global distribution of CO_2 per capita.

b. [*3 marks*] This question refers to the documentation of the `UserNetR` package[1]. Using this package, plot a network diagram of the Bali terrorist network, with the terrorists as nodes.

c. [*2 marks*] Repeat the task immediately above, but this time with the *role* of the terrorist replacing his/her name.

[1] Luke, D. (2018), '`UserNetR`: data sets for a user's guide to network analysis in `R`', *R Package Version 2:26*.

QUESTION 3 **[9 marks]**

This question is based on § 11.6.5 of the Wünschiers book. In A1T3 you created two tab-separated files that contain the date from the 'expression' and 'annotation' tables. We continue to work with those two files, and solve the search queries raised in our text using `Tableau`.

a. [*3 marks*] At the top of page 310 Wünschiers uses `MySQL` to print expressions values that are less than 1 000. Using `Tableau`, solve this problem, clearly explaining your approach.

b. [*3 marks*] Towards the bottom of page 310 Wünschiers searches the 'annotation' table for instances of the string 'ase' in the 'function' field. Using `Tableau`, solve this problem, clearly explaining your approach.

c. [*3 marks*] On page 311 Wünschiers searches the 'annotation' table for instances of the string 'Purine biosynthesis' or 'Pyramidine biosynthesis' in the 'function' field. Using `Tableau`, solve this problem, clearly explaining your approach.

End of assignment

The submission deadline for Task 3 of Assignment 2 is 12 noon on May 14 2020. You need to submit your solutions (in one `.pdf` file) to the link on `iLearn` prior to this time. Your solutions may be typed or handwritten and scanned. You *must* show all your working in your solutions for full marks. Refer to `iLearn` for further submission details. Please note that uploading a file can take up to 15 minutes. You need to submit your file at least 20 minutes before the deadline to ensure a successful submission.

Place your code on `GitHub` so it can be checked. Include its location (the `URL` of the repository it's in, and the file names, so all bits and pieces can be identified and re-assembled by a total stranger in minimal time) in your written document so it can be found.