Date of entry	What I've worked on	What problems I encountered	What I learned	Which resources did I use
6.12 (2h)	Deciding on research question, first overview		- The Bokeh task seems a bit more difficult, however I would also learn much more, because I am familiar with tf-idf already. So I will choose the Bokeh task.	- Scientific programming website and linked rescources - Internet search for Bookeh - Internet search for tf-idf
7.12 (3h)	- Reading in the data (this was really easy) - Some Bokeh tutorials	- Some of the Tutorial tasks had issues/errors, but I just skipped them. My goal was to get an overview on Bookeh, I didn't go too deep.	- I learned the Bokeh basics - However: I decide to not do too much tutorials in the beginning, but to rather go with a "learning by doing" procedure. So after I made some very basic tutorials, now I will jump into the project and use the internet, the docs of bookeh etc. whenever I face a challenge I don't know how to solve. This is just a personal decision, as my learning type is learning by doing (and also given the limited time)	- Bokeh Library Docs - Tutorials on SP page
8.12 (5h)	- Creating a world map with Geopandas - Preprocessing the data (TODO) - Coloring the countries based on life expectancy and fertility for a certain year - Showing the life expectancy on Hover	- OS related Problems when installing geopandas, jupyter notebook crashing, etc. but got it fixed - The naming in the csv, and in Geopandas is not consistent, so I had to do some manual preprocessing - I did not like the palettes. I want it to	- Geopandas Basics - Bookeh Palettes and Coloring (the latter was part of one of the tutorials on the SP-webpage)	- Geopandas Docs - https://docs.bokeh.org/en/latest/docs/reference/palettes.html - https://docs.bokeh.org/en/2.4.1/docs/user_guide/tools.html

		go from red over yellow to green for the life expectancy (makes most sense IMO). So I defined one myself here		
10. 12 (8h)	- Implementing the interactive slider - Implementing the animation	- The slider was really tricky because it required a callback function (even tho I have experience with JavaScript already) Also, Bookeh doesn't work well with Edge (which I figured out late). Furthermore, it took me quite some research until I found Bookeh has these JavaScript callbacks, and how to use them to manipulate the map	- JavaScript Callback functions - Slider, Buttoms and Layouts in Bookeh - Executing a JS-function repeatedly using setInterval() and ClearInterval()	https://docs.bokeh.org/en/3.0.2/docs/user_guide/interaction/js_callbacks.html https://developer.mozilla.org/en-US/docs/Web/API/setInterval (the Mozilla docs are quite good tbh) Internet-Search/Tutorials on the concept of callback functions
11. 12 (3h)	- Implementing a drop-down menu - Implementing the Fertility Map	- I am not sure if I made the right choice using JS-callback, or if Python callbacks would have been a better modelling choice	- Bookeh Select - More on how to dynamically change the displayed data	https://docs.bokeh.org/en/latest/docs/user_guide/interaction/widgets.html
12. 12 (8h)	- Implementing Line Diagrams for each Country, that show the development of Fertility and Life Expectancy and display this line diagram on click; go back to the	- The Kernel was starting to cache the callback functions, which was very annoying as I had to restart it to test every change - Changing the line plot such that Fertility and LifeExpectancy have different y-axis (like in my plot for assignment 7) was much more tricky then expected - Im not 100% happy with the design tbh,	- Bookeh ToolTips - How to draw a nice lineplot with Bookeh - Adding an extra y-range	- https://docs.bokeh.org/en/latest/docs/user_guide/interaction/tooltips.html - Internet search/tutorials on the basics of LinePlots with Bookeh

		as I think a line-diagramm in the “foreground” with the worldmap in the background (greyed out) would look nicer. However, for time reasons I left it like this		
15.12 and 16.12 (6hrs)	- Implementing a map which shows the relation between Fertility and Life Expectancy	- I strongly wanted the user to be able to select a start year and an end year for the research question	- pandas multi-index - more about data frames and how to use them to solve problems	https://pandas.pydata.org/docs/user_guide/advanced.html
18.12 (5hrs)	Implementing the map which shows relation between Fertility and Life Expectancy	Unfortunately, I underestimated the time needed for this step. Therefore, I will have to restrict the smaller research question on the same area. (Originally, I planned to make an analysis on outliers and potential reasons) Furthermore, I (also for time reasons) separated the plots, linking them with a button to each other. I think a nicer way to do this would be to integrate it into the drop-down menu (which has “Fertility” and “LifeExpectancy”), however, for time reasons this was not implemented anymore.	- dataframes - more about callback functions	