CS7DS4 Data Visualization 2019-20 Assignment 1.2

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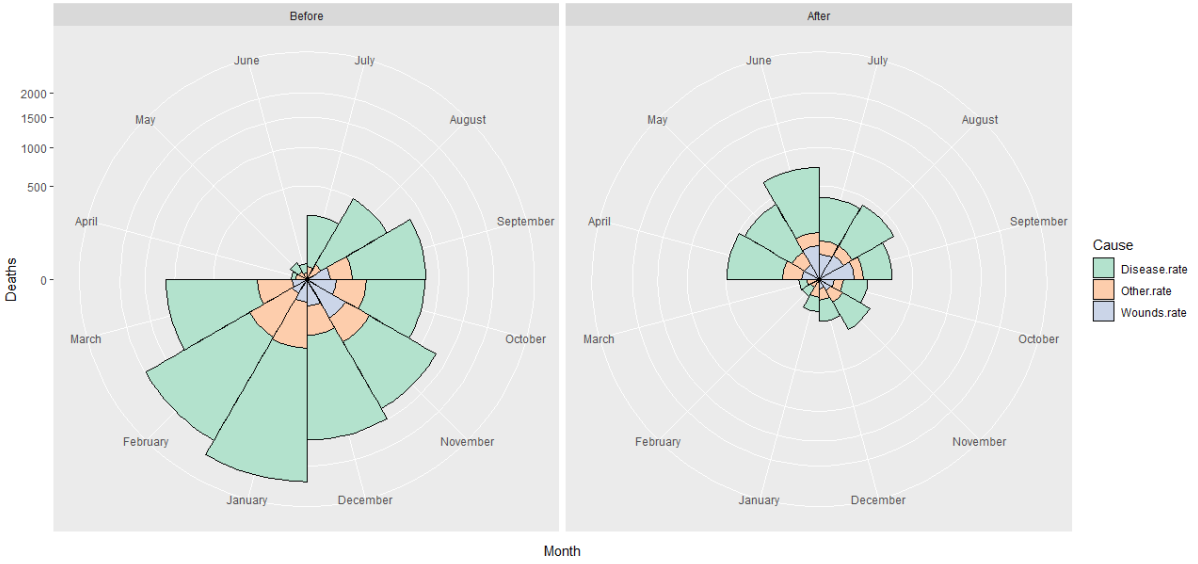
Declaration:

"I have read and I understand the plagiarism provisions in the General Regulations of the University Calendar for the current year, found at http://www.tcd.ie/calendar.

I have also completed the Online Tutorial on avoiding plagiarism 'Ready Steady Write', located at http://tcd-ie.libguides.com/plagiarism/ready-steady-write."

PART A. NIGHTINGALE'S ROSE CHART



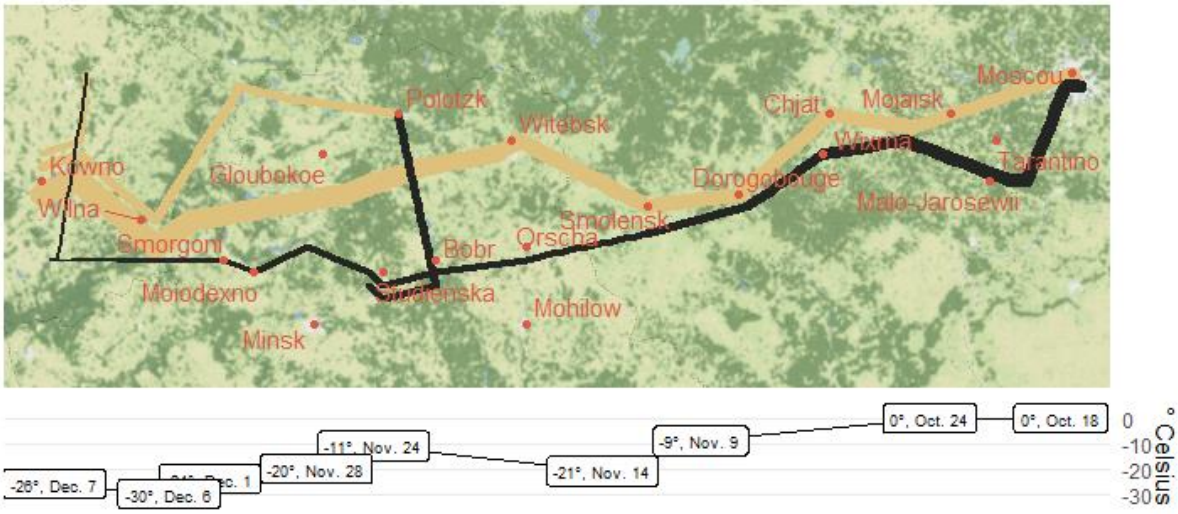
Rose/Coxcomb chart is used to represent data just like bar or pie chart. It has following properties:

- Each category which must be represented, is represented as a sector of a disc, such that all the sectors have equal share of angle.
- The area of the respective sectors represents the values which are supposed to be represented.
    - Note: It is the areas of the sectors (not the radius) which are in similar ratio as the value.

Plotted Rose chart depicts the 'Diagram of the causes of mortality in the army in the east' as plotted by Nightingale:

- Each Rose chart has 12 sectors each representing one of the 12 months starting from April 1854 in one plot and April 1855 in another.
- The area of each sector represents the annual death rate.
- Area of coloured part of each section represent the cause of death, i.e. out of total deaths how many are caused by disease (green), wounds (blue) and others (yellow).

PART B. MINARD'S MAP



The graph depicts the trail of the map of Napoleon's Russia campaign, number of survivors along the path and temperature while retreat. Depiction of plot:

- The colour of the path shows the direction of movement, i.e. black (retreat) and yellow (the other way).
- Width of the line shows the relative number of survivors at each point on the way.
- Temperature on the retreat along with the dates is shown with the black line graph below with its y-scale on the right.
- The text on the army's path shows the name of the cities mapped according to their latitude and longitude.

Statement of tool, language and libraries used:

- **Language**: R
- **Tool**: RStudio
- **Libraries**:
    - ***tidyverse*** and ***lubridate*** were used for initial data manipulation.
    - ***ggmap*** was used to extract tiles of map.
    - ***ggrepel, ggplot*** were used in combination to plot graphs and avoid overlapping of labels/ text in the plots.
    - ***gridExtra, grid and knitr*** were used to put two plots in proper alignment and layed out properly.
    - ***HistData*** was used to extract data.
    - ***magrittr*** was used to decrease the time used in development and make the code easily readable.