DECLARATION: I understand that this is an **individual** assessment and that collaboration is not permitted. 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 understand that by returning this declaration with my work, I am agreeing with the above statement.

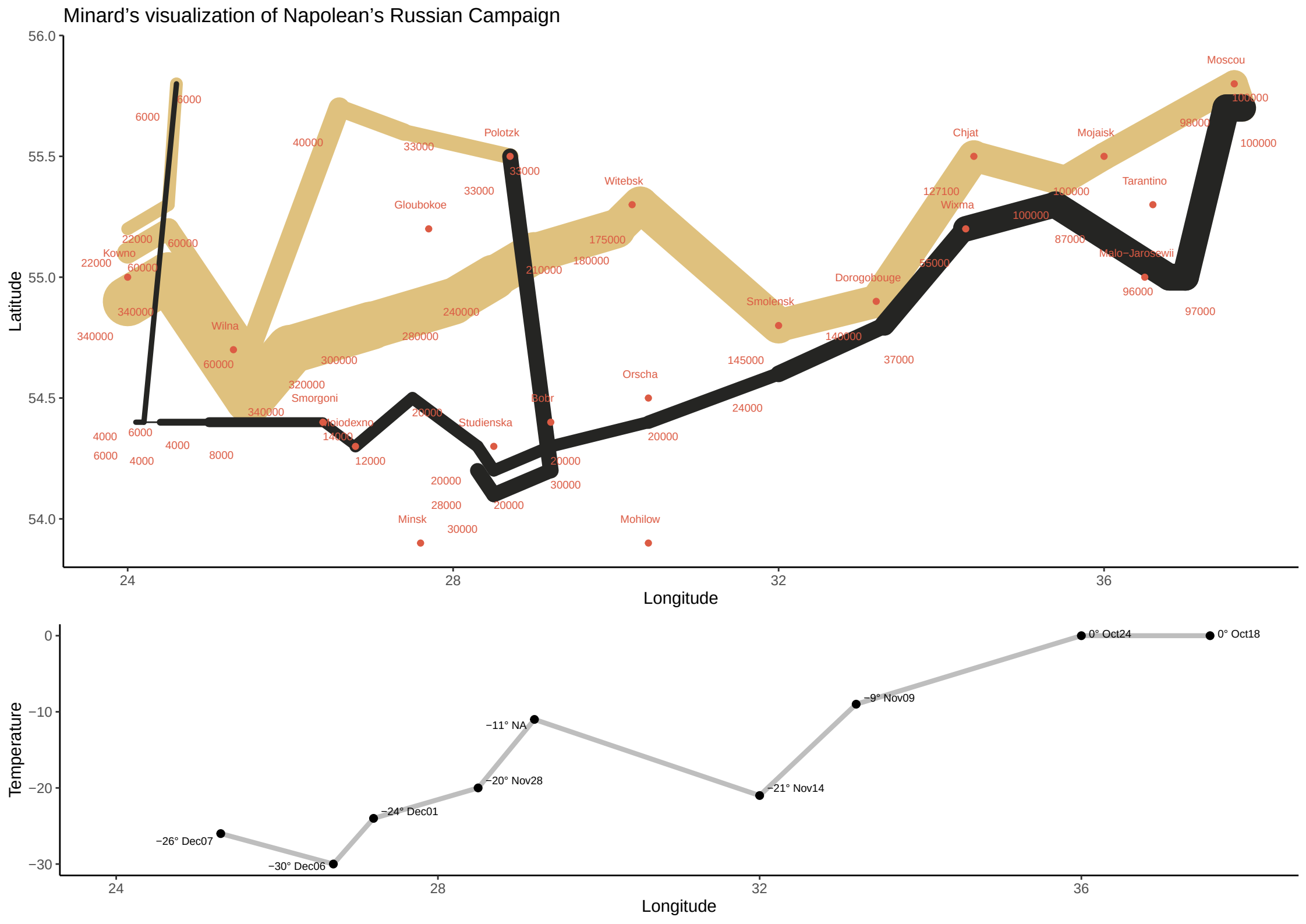
I have used R programming language to create Minard chart of Napoleon's March to Russia in 1812-13 AD. In R, I have used ggplot2 library to create the Minard chart.

I have used geom_path() function to draw path of the army. When the army is marching towards Russia, I have used aesthetic parameter with scale_color_manual() function to set colour to hex DFC17E and when army is retreating from Russia, I have used the same strategy to set colour to hex 252523. Also, I have increased the size of the scale as ggplot() automatically changing Survivor variable to three discrete categories. Therefore, to show more different categories I adjusted the scale. To show the cities and troops along the route, I have added the points on the path using geom_point() and mentioned the name of the cities using geom_text() on the path plotted above. TO plot temperature, I have again used geom_path() function. To show the temperature on different days I added a new column temp_on_date which is a combination of two different columns temp and date. I used mutate() function of dplyr library to create a this column and we used paste0() function to combine these two columns without any space. To show the above new column on the plot, I used geom_text_repel() where we set the label as temp_on_date.

To show both the plots together as one, Iused grid.arrange() function I passed both the plots. Finally, I exported the plot as PNG. Please refer next page for plot generated. Also, I have attached code along with this report where I have added comments on each line and tried to explain the purpose of each line of code

References

- GGPLOT2: https://cran.r-project.org/web/packages/ggplot2/index.html
- DPLYR: https://cran.r-project.org/web/packages/dplyr/vignettes/dplyr.html


Minard’s visualization of Napolean’s Russian Campaign
Latitude
Longitude
56.0
55.5
55.0
54.5
54.0
24
28
32
36
Moscou
Chjat
Mojaisk
Tarantino
Polotzk
Witebsk
Gloubokoe
Wixma
Malo-Jarosewii
Dorogobouge
Smolensk
Wilna
Kowno
Orscha
Bobr
Smorgoni
Studienska
Minsk
Mohilow
Temperature
0° Oct24
0° Oct18
−9° Nov09
−11° NA
−20° Nov28
−21° Nov14
−24° Dec01
−26° Dec07
−30° Dec06