1. Introduction

I mainly used Python's Pandas and Altair libraries and Json's Vega-Lite library to complete to complete the marching route. For the date and temperature graphs I used Python's Pandas and Matplotlib.

2. Programming ideas

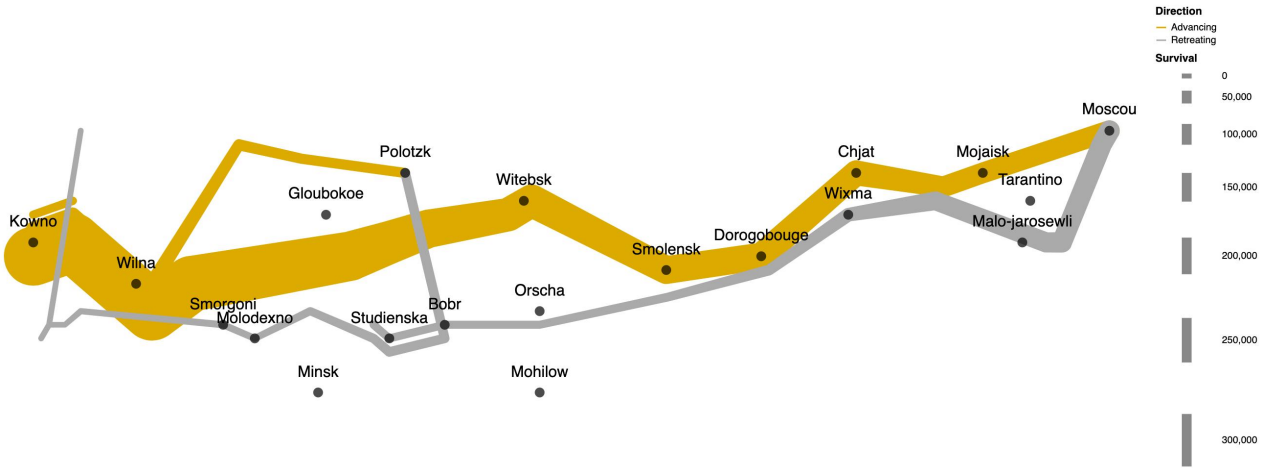
Route of march: Firstly, the Pandas library was used to read the data from the xlsx file. Secondly, I used the mark_text function of the Altair library to draw the names of the cities in the appropriate places. Thirdly, use the mark_trail function of the Altair library to plot the survival number as the width of the curve to plot the marching route. Finally, JSON code was generated to plot the city coordinate points in the Veta-Lite environment, merging the two maps of the marching route and the city location together.

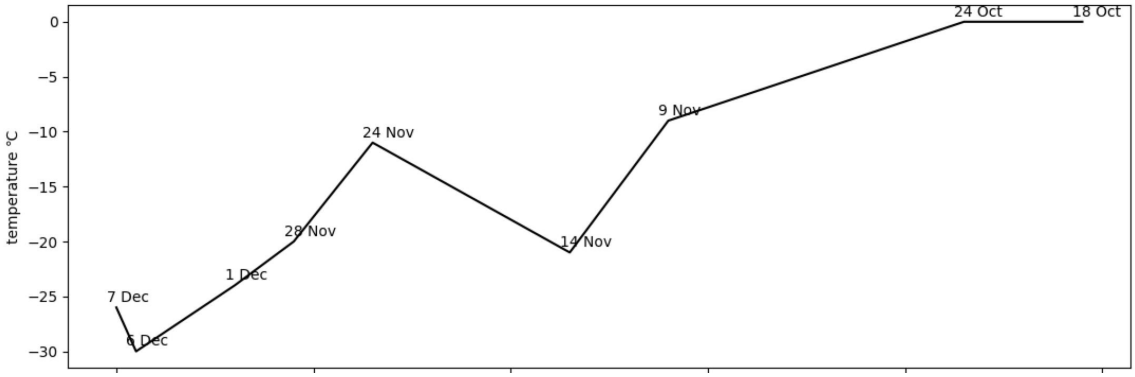
Date temperature curves: Firstly, the data from the xlsx file is read through the Pandas library. Secondly, the data type is converted to list type, flipping the order of the data. Finally the curve was plotted using Matplotlib's plot function.

3. Graph description

The yellow part represents the advancing marching route, the light grey part represents the retreating route, the width of the curve represents the number of survivors, and there is a comparison table between the width and the number of survivors on the right side. The horizontal coordinates in the date and temperature curves are the month and date, and the vertical coordinates are the temperature in degrees Celsius.

The images are shown below.


Direction
Advancing
Retreating
Survival
0
50,000
100,000
150,000
200,000
250,000
300,000
Kowno
Wilna
Gloubokoe
Polotzk
Witebsk
Smolensk
Dorogobouge
Chjat
Wixma
Mojaisk
Tarantino
Malo-jarosewli
Moscou
Smorgoni
Molodexno
Studienska
Bobr
Orscha
Minsk
Mohilow


temperature °C
0
−5
−10
−15
−20
−25
−30
7 Dec
6 Dec
1 Dec
28 Nov
24 Nov
14 Nov
9 Nov
24 Oct
18 Oct