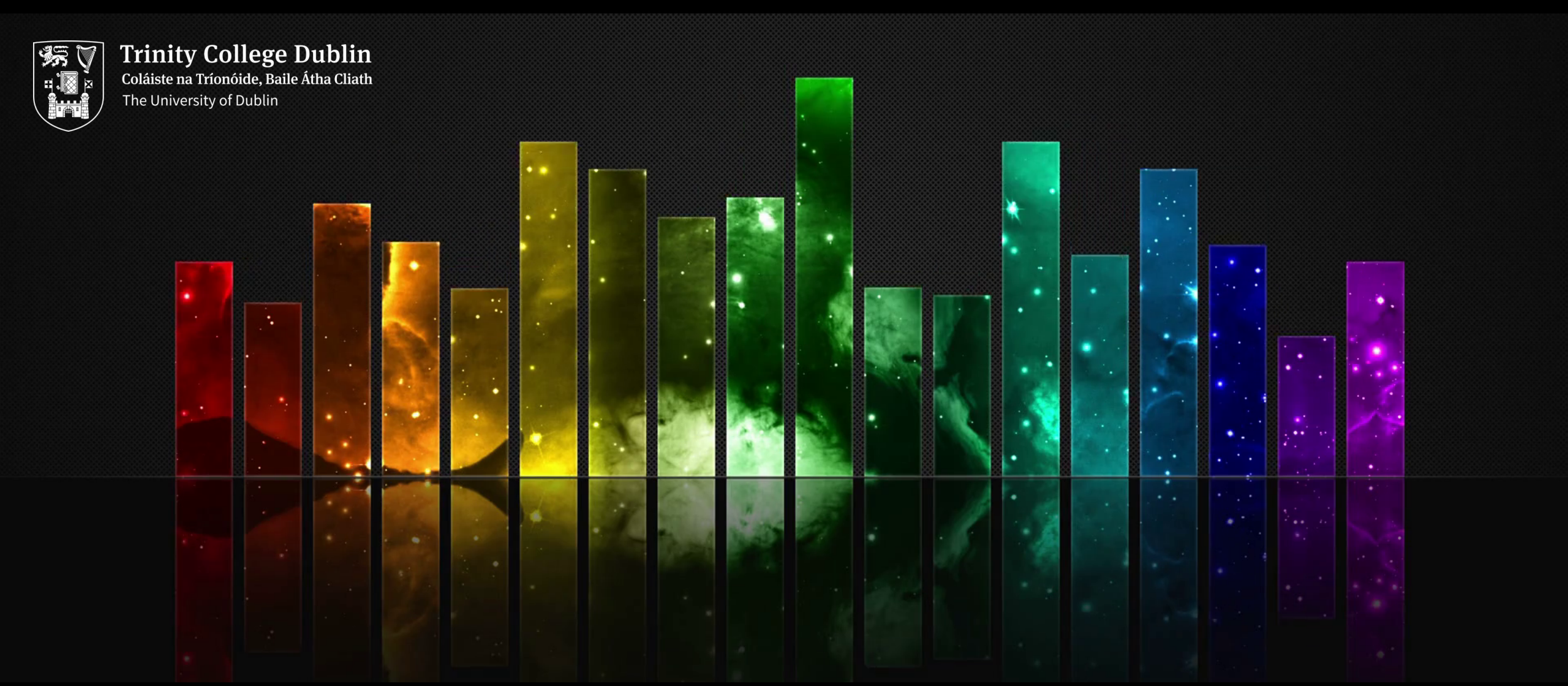


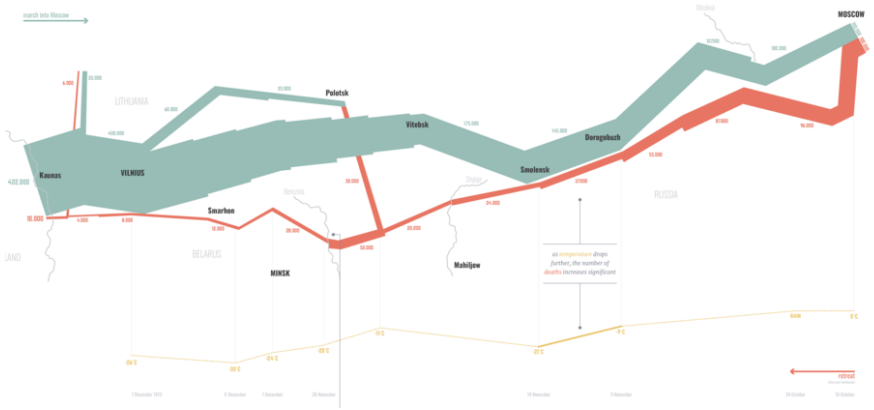
Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

ASSIGNMENT 1.2

Graphics Primitives for Visualization

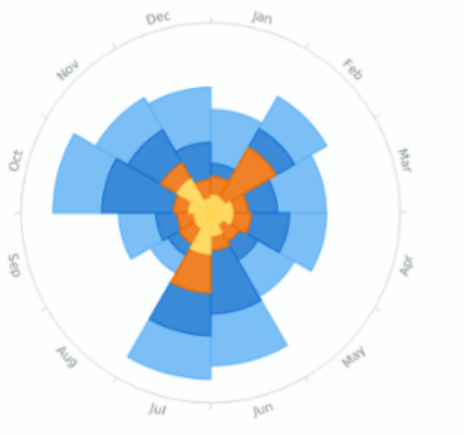
DUE 01/03/2020

ASSIGNMENT 1.2



Objectives:

1. Ensure you have enough technical tools to create visualizations
2. Implement some basic shapes using vector graphics components
   - Manipulate style parameters i.e. shape attributes (colour, line widths)
   - Transform objects in 2D (position, rotate, resize)
   - Save the output as a single PDF for submission
3. Recreate some famous Visualizations
   - Viz elements explored: colour, position and size encoding, radial chart, spatial data

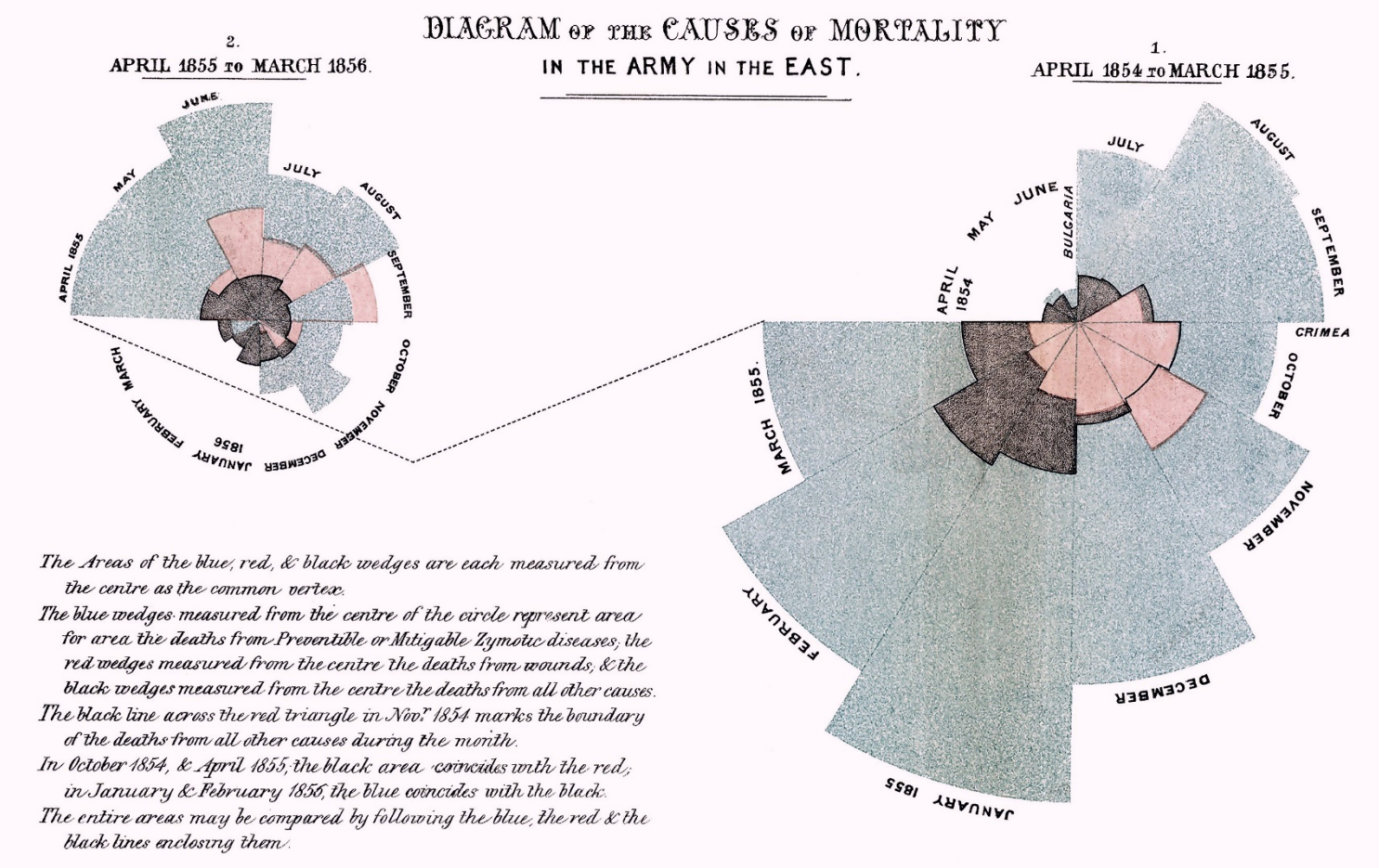


Specifications

- You may use any tool/programming language that you wish [Yes, you may even use TABLEAU]
  - BUT weekly support is mainly provided for Processing
- This assignment is worth **42% of the module** and **due on 1st March 2020**
- Submission should be through mymodule.tcd.ie. Module code CS7DS4
- **Submit** : a PDF with an image of your visualizations and a brief half page description of each.
  Also submit code OR source files OR link to online visualization

PART A. NIGHTINGALE'S ROSE CHART

[40% OF THIS ASSIGNMENT]



		Deaths			Annual Rates of Mortality per 1000		
Month	Average size of army	Zymotic diseases	Wounds & injuries	All other causes	Zymotic diseases	Wounds & injuries	All other causes
Apr 1854	8571	1	0	5	1.4	0	7
May 1854	23333	12	0	9	6.2	0	4.6
Jun 1854	28333	11	0	6	4.7	0	2.5
Jul 1854	28722	359	0	23	150	0	9.6
Aug 1854	30246	828	1	30	328.5	0.4	11.9
Sep 1854	30290	788	81	70	312.2	32.1	27.7
Oct 1854	30643	503	132	128	197	51.7	50.1
Nov 1854	29736	844	287	106	340.6	115.8	42.8
Dec 1854	32779	1725	114	131	631.5	41.7	48
Jan 1855	32393	2761	83	324	1022.8	30.7	120
Nov 1855	37853	178	33	32	56.4	10.5	10.1
Dec 1855	43217	91	18	28	25.3	5	7.8
Jan 1856	44212	42	2	48	11.4	0.5	13
Feb 1856	43485	24	0	19	6.6	0	5.2
Mar 1856	46140	15	0	35	3.9	0	9.1

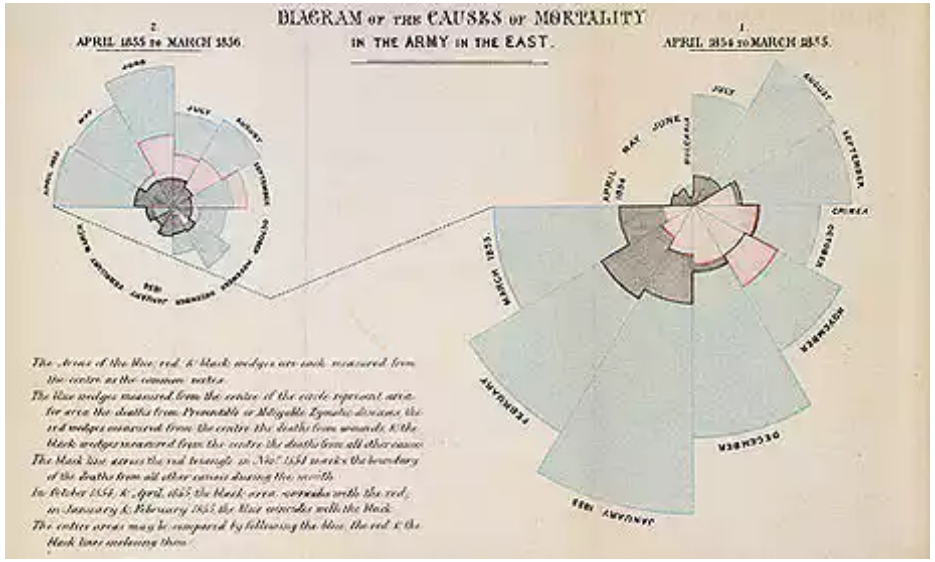
N.B. ONLY PART OF THE DATA IS SHOWN DUE TO SPACE LIMITATIONS.

PART A. NIGHTINGALE'S ROSE CHART

[40% OF THIS ASSIGNMENT]

Replicate Florence Nightingale's visualization

- Described as a *Coxcomb Chart*, *Rose Chart* or *Polar Area Chart*. Read about the visualization here (this is the source for the dataset provided): https://understandinguncertainty.org/node/214
- You are not required to use all of the data and may just visualize a subset (e.g. 1 year of the data). You may even replace/make up the numbers (**we're only interested in if you can draw this type of shape**)
- You can use your own colours as you see fit but should demonstrate different colours and line styles.
- You must redraw it twice on one page/canvas to demonstrate you can do transformations; the second copy should be zoomed, repositioned and rotated differently



Marking (for Part A):

- 0-20 for essential elements: drawing something that looks like, a Coxcomb chart, demonstrating understanding of how to use line style, geometry, colours, transformations
- 0-20 qualitative marking: correctness of solution (viz depicts data), generality (solution works with other data values), understandability, neatness, effort (something not mentioned here)

PART B. MINARD'S MAP
[60% OF THIS ASSIGNMENT]

IMPORTANT NOTE: **For this part you are required to use the actual historical data (unlike in part A)** although minimal manual clean up is permitted.

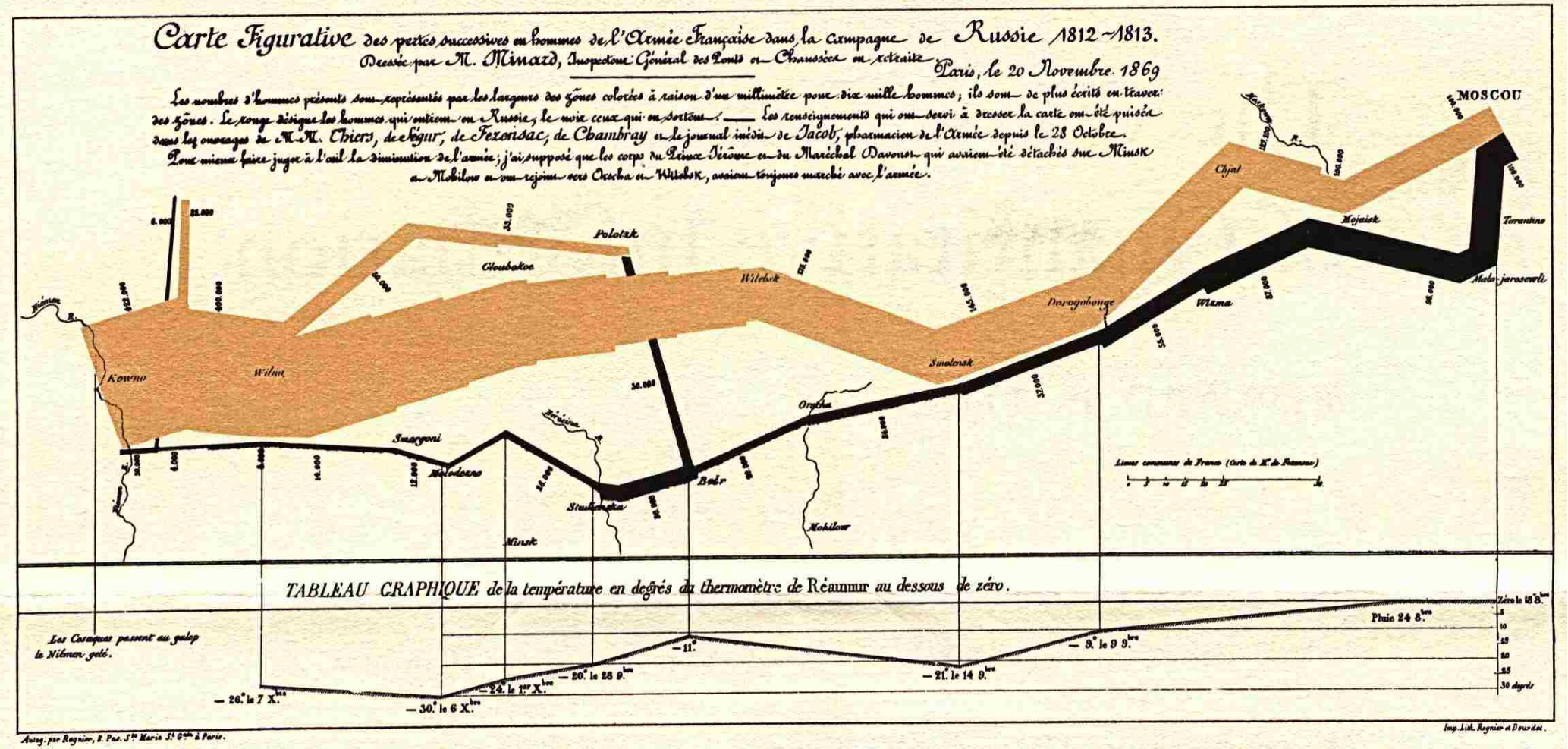
Recreate Minard's visualization of Napolean's Russian Campaign

- An Excel version of the data is provided **(on mymodule.tcd.ie)**
- You may retrieve the data from other sources e.g. the HistData package for R contains this .
- You may manually or otherwise simplify the spreadsheet (e.g. break it up, insert it into an array declaration etc.)
- You do not have to match Minard's exact look (this may be impossible without a lot of manual work). In fact you are encouraged to find alternative ways of representing the data.
- Your visualization MUST show (a) position of cities and path of army through them, (b) survivors in the army along the path, (c) temperature during retreat

Marking (for Part B):

- 0-30 for visually depicting all of the required elements of the data in some way,
- 0-30 qualitative mark based in complexity, understandability, correctness, effort

CHARLES JOSEPH MINARD'S MAP OF NAPOLEON'S RUSSIA CAMPAIGN.



Your visualization MUST show the following elements: (a) position of cities and path of army through them, (b) survivors in the army along the path, (c) temperature during retreat

MINARD DATA SET

N.B. SHOWN BELOW IS ONLY PART OF THE DATA SET DUE TO SPACE LIMITATIONS.. There are several more rows in the full data.

This is provided as an excel sheet, modified from dataset available as the HistData package for R.

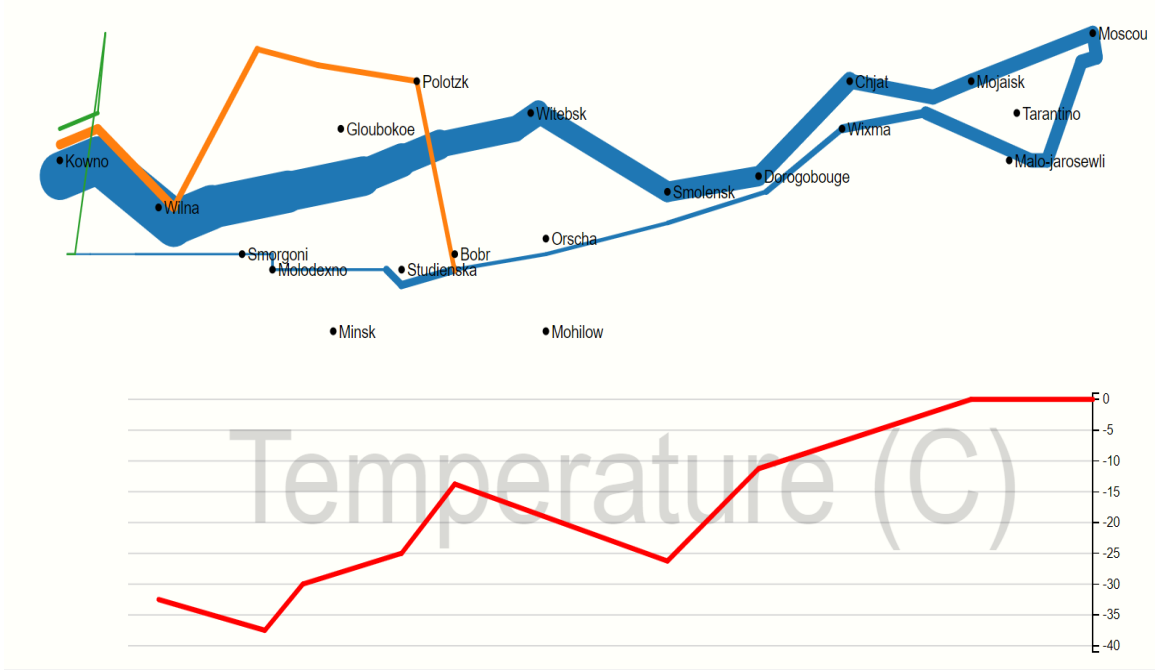
Essentially consists of 3 separate tables

- Columns 1-3 are longitude, latitude and names of cities
- Columns 4-8: longitude, temperature, dates (during the march home only)
- Columns 9-14: longitude, latitude, number of survivors, direction of travel (A=towards the attack/R=return journey), division of army

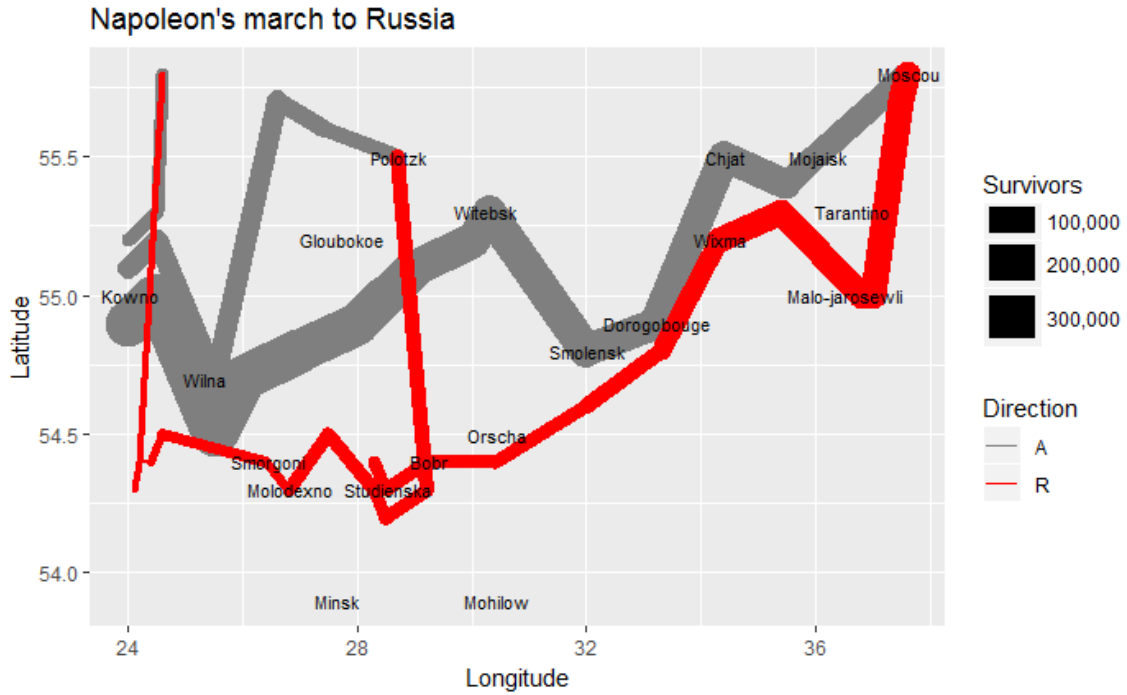
LONC	LATC	City	LONT	TEMP	DAYS	MON	DAY	LONP	LATP	SURV	DIR	DIV
24	55	Kowno	37.6	0	6	Oct	18	24	54.9	340000	A	1
25.3	54.7	Wilna	36	0	6	Oct	24	24.5	55	340000	A	1
26.4	54.4	Smorgoni	33.2	-9	16	Nov	9	25.5	54.5	340000	A	1
26.8	54.3	Molodexno	32	-21	5	Nov	14	26	54.7	320000	A	1
27.7	55.2	Gloubokoe	29.2	-11	10			27	54.8	300000	A	1
27.6	53.9	Minsk	28.5	-20	4	Nov	28	28	54.9	280000	A	1
28.5	54.3	Studienska	27.2	-24	3	Dec	1	28.5	55	240000	A	1
28.7	55.5	Polotzk	26.7	-30	5	Dec	6	29	55.1	210000	A	1
29.2	54.4	Bobr	25.3	-26	1	Dec	7	30	55.2	180000	A	1
30.2	55.3	Witebsk						30.3	55.3	175000	A	1
30.4	54.5	Orscha						32	54.8	145000	A	1
30.4	53.9	Mohilow						33.2	54.9	140000	A	1
...	...	...						...	...	...	...	...

SOME EXAMPLES
(BUT NOT GOLD STANDARDS)

NOTE that you don't have to replicate Minard's Look exactly. Minard would have done it by hand which has benefits and disadvantages. You might even be able to improve upon it.



http://benschmidt.org/D3-trail/minard.html



http://www.rpubs.com/Minh_Bui/257561