Problem/user definition : 3/3
task formulation: 2/2.5
dataset: 1.5/1.5

total: 6.5/7

Interesting topic and dataset. The choice of flow maps is appropriate, but I encourage you to explore other visualization ideas as well.

CMSC734 Project Proposal: Forced Displacement Flow

Shrey Patel, Siddhant Bharti, Yuhao Song

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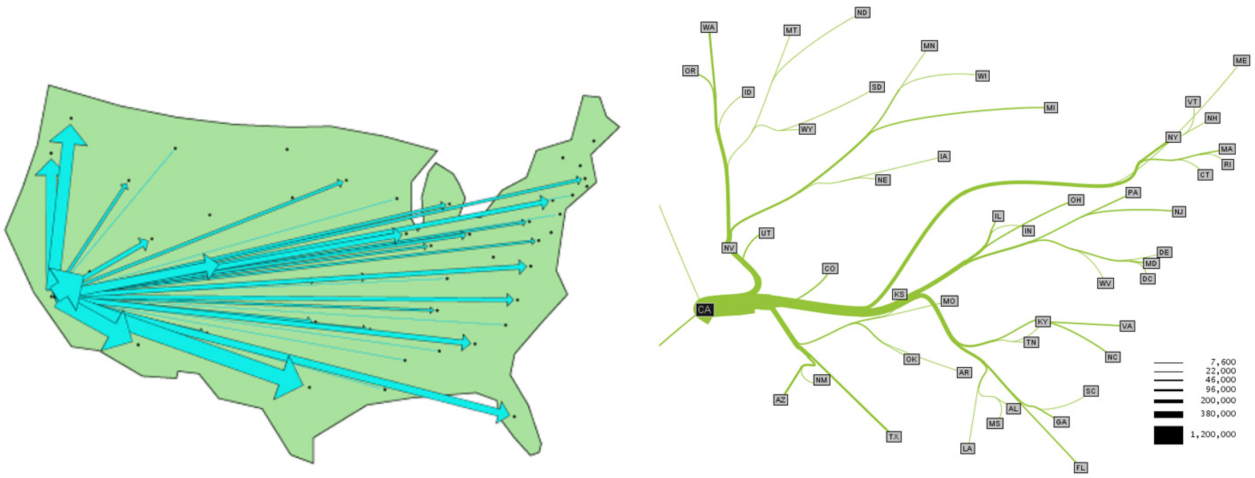
Problem

The main aim of our project is to study the forced migration of people, either refugees or asylum seekers, around the globe over different years. For this purpose, we plan to use a graph based visualization with nodes representing nations of the world, and edges representing migration. The volume of migration decides the weight of the edge.

Many graph-based visualizations tend to suffer from data clutter because of edge crossings (1a). We address this using Flow Maps [1, 4, 5], which merge multiple edges going from/to the same origin/destination using hierarchical clustering. This, in addition to studying only one origin or destination at a time, reduces the graph to a tree, which minimizes edge crossings, and is thus clearer and easier to visualize (1b).



(a) Movement map [3] (b) Flow map [1]

Figure 1: Traditional methods for visualizing migration

Users

Our primary user group consists of global policymakers and organizations such as UN, UNHCR. The users of this tool extends to governments on both sides of this migration. Using our dashboard the user should be able to understand the extent of refugee displacement over the years from various source countries and their respective target countries. This helps users and their organizations understand adequate allotment of resources and assets and also helps them audit their progress in combating this problem. These users have expertise in refugee policies, and national and international law. They also have a deep knowledge on international relationships, asylum procedures, and international aid distribution. However, these user lack specialization in data visualization or statistical analysis. We aim to close this gap.

Goals and Tasks

High-Level Goal: With the visualized data, the **Users** should be able to assess and evaluate the resources needed in an area with an influx of refugees.

origin	OriginISO	OriginName	asylum	AsylumISO	AsylumName	AsylumRegion	PT	Year	Count
ALG	DZA	Algeria	MTA	MLT	Malta	Europe	REF	1962	5
ANG	AGO	Angola	COD	COD	Dem. Rep. of the Congo	Southern Africa	REF	1962	20,000
ANG	AGO	Angola	NAM	NAM	Namibia	Southern Africa	REF	1962	277
BDI	BDI	Burundi	NAM	NAM	Namibia	Southern Africa	REF	1962	13
CHI	CHN	China	NEP	NPL	Nepal	Asia and the Pacific	REF	1962	5
COB	COG	Congo, Republic of	NAM	NAM	Namibia	Southern Africa	REF	1962	8
COD	COD	Dem. Rep. of the Congo	NAM	NAM	Namibia	Southern Africa	REF	1962	13
IRQ	IRQ	Iraq	MTA	MLT	Malta	Europe	REF	1962	17
SOM	SOM	Somalia	NAM	NAM	Namibia	Southern Africa	REF	1962	5
SUD	SDN	Sudan	MTA	MLT	Malta	Europe	REF	1962	10
TIB	TIB		NEP	NPL	Nepal	Asia and the Pacific	REF	1962	2,236
ANG	AGO	Angola	COD	COD	Dem. Rep. of the Congo	Southern Africa	REF	1963	5,000
ARE	EGY	Egypt	LEB	LBN	Lebanon	Middle East and North Africa	REF	1963	160
ROM	ROU	Romania	LEB	LBN	Lebanon	Middle East and North Africa	REF	1963	70
RWA	RWA	Rwanda	BDI	BDI	Burundi	East and Horn of Africa, and Great Lakes	REF	1963	4,000
RWA	RWA	Rwanda	COD	COD	Dem. Rep. of the Congo	Southern Africa	REF	1963	1,000
RWA	RWA	Rwanda	UGA	UGA	Uganda	East and Horn of Africa, and Great Lakes	REF	1963	2,000
SUD	SDN	Sudan	COD	COD	Dem. Rep. of the Congo	Southern Africa	REF	1963	8,000
SUD	SDN	Sudan	UGA	UGA	Uganda	East and Horn of Africa, and Great Lakes	REF	1963	5,000
UKN	UKN	Unknown/other	UKN	UKN	Unknown/other		REF	1963	40
ANG	AGO	Angola	COD	COD	Dem. Rep. of the Congo	Southern Africa	REF	1964	25,000
ARM	ARM	Armenia	ARE	EGY	Egypt	Middle East and North Africa	REF	1964	90
COB	COG	Congo, Republic of	BDI	BDI	Burundi	East and Horn of Africa, and Great Lakes	REF	1964	20,000
COB	COG	Congo, Republic of	CAR	CAF	Central African Rep.	West and Central Africa	REF	1964	3,000
COB	COG	Congo, Republic of	TAN	TZA	United Rep. of Tanzania	East and Horn of Africa, and Great Lakes	REF	1964	1,700
COB	COG	Congo, Republic of	UGA	UGA	Uganda	East and Horn of Africa, and Great Lakes	REF	1964	34,000
GUI	GIN	Guinea	SEN	SEN	Senegal	West and Central Africa	REF	1964	24,000
MOZ	MOZ	Mozambique	TAN	TZA	United Rep. of Tanzania	East and Horn of Africa, and Great Lakes	REF	1964	10,000
RWA	RWA	Rwanda	BDI	BDI	Burundi	East and Horn of Africa, and Great Lakes	REF	1964	24,000
RWA	RWA	Rwanda	TAN	TZA	United Rep. of Tanzania	East and Horn of Africa, and Great Lakes	REF	1964	1,300
RWA	RWA	Rwanda	UGA	UGA	Uganda	East and Horn of Africa, and Great Lakes	REF	1964	13,000
SUD	SDN	Sudan	CAR	CAF	Central African Rep.	West and Central Africa	REF	1964	300
SUD	SDN	Sudan	UGA	UGA	Uganda	East and Horn of Africa, and Great Lakes	REF	1964	7,000
UKN	UKN	Unknown/other	LEB	LBN	Lebanon	Middle East and North Africa	REF	1964	370

Figure 2: Forced displacement flow dataset

- Task 1: **Users** should be able to determine the total count of refugees or asylum seekers within a given time frame and region.
- Task 2: **Users** should be able to identify high-influx and high-outflux regions within a given time frame.
- Task 3: **Users** should be able to identify the top host countries within a given time frame and region.
- Task 4: **Users** should be able to identify the ratio of refugee movement within a specific region compared to the flow outside the region within a given time frame and region.
- Task 5: **Users** should be able to determine the total proportion of refugees or asylum seekers within a given time frame and region.

How about comparing flow patterns over time and between regions?

Dataset

We will work with data from UNHCR Forced Displacement Flow Dataset. The dataset records forced displacement flows from 1962 onwards, capturing the movement of refugees and other people in need of international protection. The data schema includes:

1. origin: code for the country of origin
2. OriginISO: ISO code for the country of origin
3. OriginName: Name of the country of origin
4. asylum: code for the country of asylum
5. AsylumISO: ISO code for the country of asylum
6. AsylumName: Name of the country of asylum
7. AsylumRegion: Regional classification of the country of asylum
8. PT: Population type (e.g., refugee, asylum seeker)
9. Year: Year of displacement record
10. Count: Number of displaced individuals recorded

The dataset has 103,344 records of forced displacement and the dataset file is 7.1MB. Sample records can be found in figure 2.

Team Members and Responsibilty

The team comprises of:

1. Shrey Patel: Code for flow maps; Data Preparation.
2. Siddhant Bharti: Code for flow maps; Data Preparation.
3. Yuhao Song: Report writing and filters for time selection and country selections.

References

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