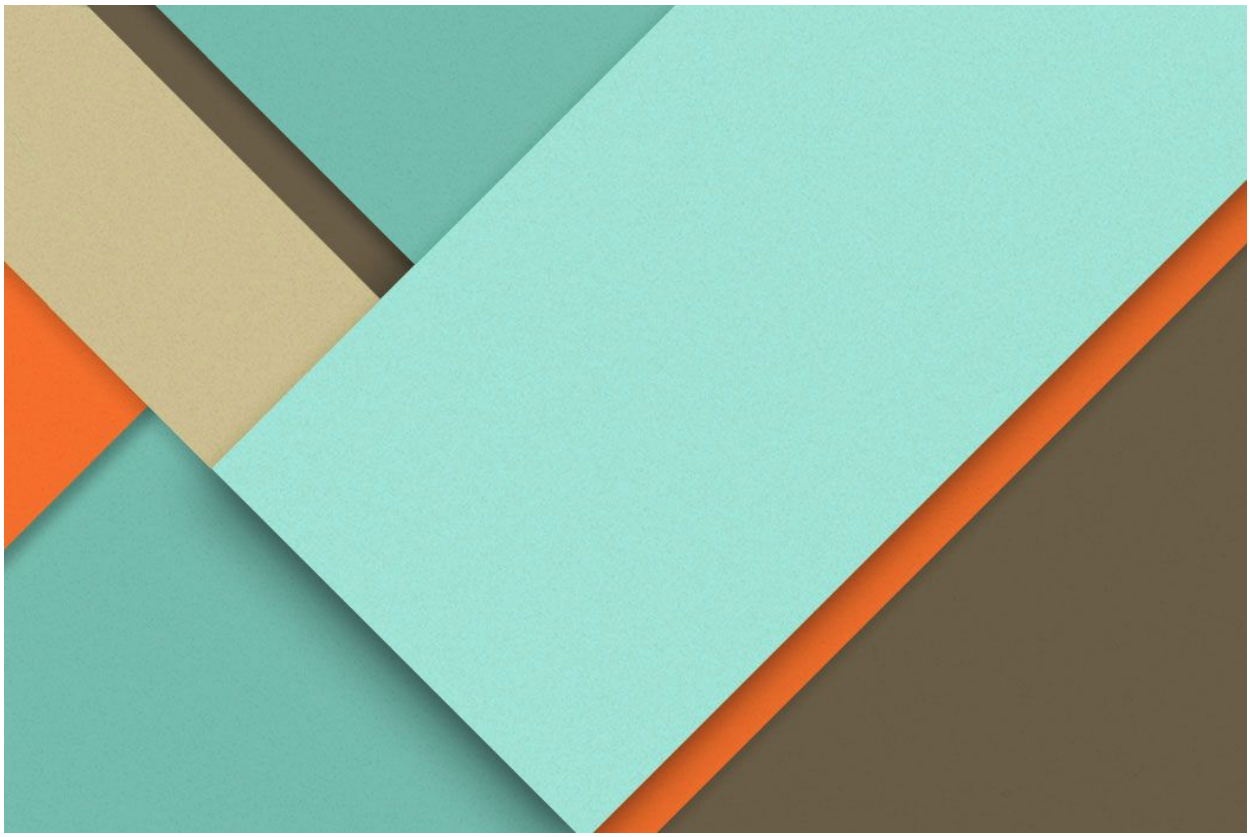

Analysis of Hate Crimes In United States

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https://github.com/varunadd2712/VisualizationProject

Maitrey Mehta
U1201309
maitrey@cs.utah.edu

Sai Varun
U1210409
sai.varun@cs.utah.edu

Shalin Parikh
U1206312
shalin.parikh@cs.utah.edu

Background and Motivation

The current rise in the amount of hate crimes in the United States motivates us as students to use the power of data to present a clean and a correct visualization. We hope that this visualization would enable users to analyze the data and infer vital insights. We believe that there aren't enough sources currently present that provide an exhaustive analysis into the type of hate crimes that span over a varied number of attributes. We plan to present data over a long period of time and aim to observe some patterns. We also want to inspect the crimes occurring both geographically and demographically over the entire country. This would enable the user to have a holistic view of the data and also focus on the specifics.

Project Objectives

A. To see what kind of **hate crimes** are prevalent over the **United States**.
B. To see which places are unsafe, both **cities and state wise.**
C. To see **trends in the crimes** over the years.
D. Provide a **metric for comparison** between various states based on the crimes committed.
E. To analyze a **particular crime** and how it is **dependent on other factors**.

Data and Data Processing

The data is a **12** table dataset, obtained from https://ucr.fbi.gov/hate-crime/2016/topic-pages/incidentsandoffenses.

We would be using the years from **2008 - 2016** for our trend analysis.

The only missing data in the dataset is certain blank rows for crime values in a city. They can be safely set to 0 and the aggregate values of the other tables aren't affected.

Our data can be categorized into

A. Statistics of the **Incidents and offenses**.
B. Statistics on the **victims.**
C. Statistics on the **offenders**.
D. Split of the above statistics based **on jurisdiction (i.e. state)**

Since we have this data over several years, we can use it to view trends or patterns in the crimes. On the whole, our visualization will be split into a visualization for the current year and a trend visualization over the years.

The different tables in the dataset give different aggregations. We'll be using the tables individually for our charts.

Examples of tables in our dataset are as follows

Incidents, Offenses, Victims, and Known Offenders
by Bias Motivation, 2016

Data Declaration Download Excel

Bias motivation	Incidents	Offenses	Victims[1]	Known offenders[2]
Total	**6,121**	**7,321**	**7,615**	**5,770**
Single-Bias Incidents	**6,063**	**7,227**	**7,509**	**5,727**
Race/Ethnicity/Ancestry:	**3,489**	**4,229**	**4,426**	**3,383**
Anti-White	720	876	909	831
Anti-Black or African American	1,739	2,122	2,220	1,588
Anti-American Indian or Alaska Native	154	161	169	118
Anti-Asian	113	131	137	123
Anti-Native Hawaiian or Other Pacific Islander	9	9	9	8
Anti-Multiple Races, Group	136	178	190	104
Anti-Arab	51	56	57	60
Anti-Hispanic or Latino	344	449	483	380
Anti-Other Race/Ethnicity/Ancestry	223	247	252	171
Religion:	**1,273**	**1,538**	**1,584**	**859**
Anti-Jewish	684	834	862	421
Anti-Catholic	62	63	65	45
Anti-Protestant	15	20	22	12
Anti-Islamic (Muslim)	307	381	388	243
Anti-Other Religion	74	90	91	53

Table 2

Incidents, Offenses, Victims, and Known Offenders
by Offense Type, 2016

Data Declaration Download Excel

Offense type	Incidents[1]	Offenses	Victims[2]	Known offenders[3]
Total	**6,121**	**7,321**	**7,615**	**5,770**
Crimes against persons:	**3,765**	**4,720**	**4,720**	**4,353**
Murder and nonnegligent manslaughter	5	9	9	9
Rape (revised definition)[4]	24	24	24	29
Rape (legacy definition)[5]	0	0	0	0
Aggravated assault	684	873	873	1,031
Simple assault	1,458	1,687	1,687	1,857
Intimidation	1,577	2,109	2,109	1,409
Other[6]	17	18	18	18
Crimes against property:	**2,519**	**2,519**	**2,813**	**1,618**
Robbery	134	134	163	249
Burglary	123	123	138	87
Larceny-theft	231	231	253	173
Motor vehicle theft	20	20	21	14
Arson	39	39	51	33
Destruction/damage/vandalism	1,913	1,913	2,122	1,015
Other[6]	59	59	65	47
Crimes against society[8]	**82**	**82**	**82**	**97**

Visualization Design

We have decided to implement our design using the Five Design Sheet Methodology.

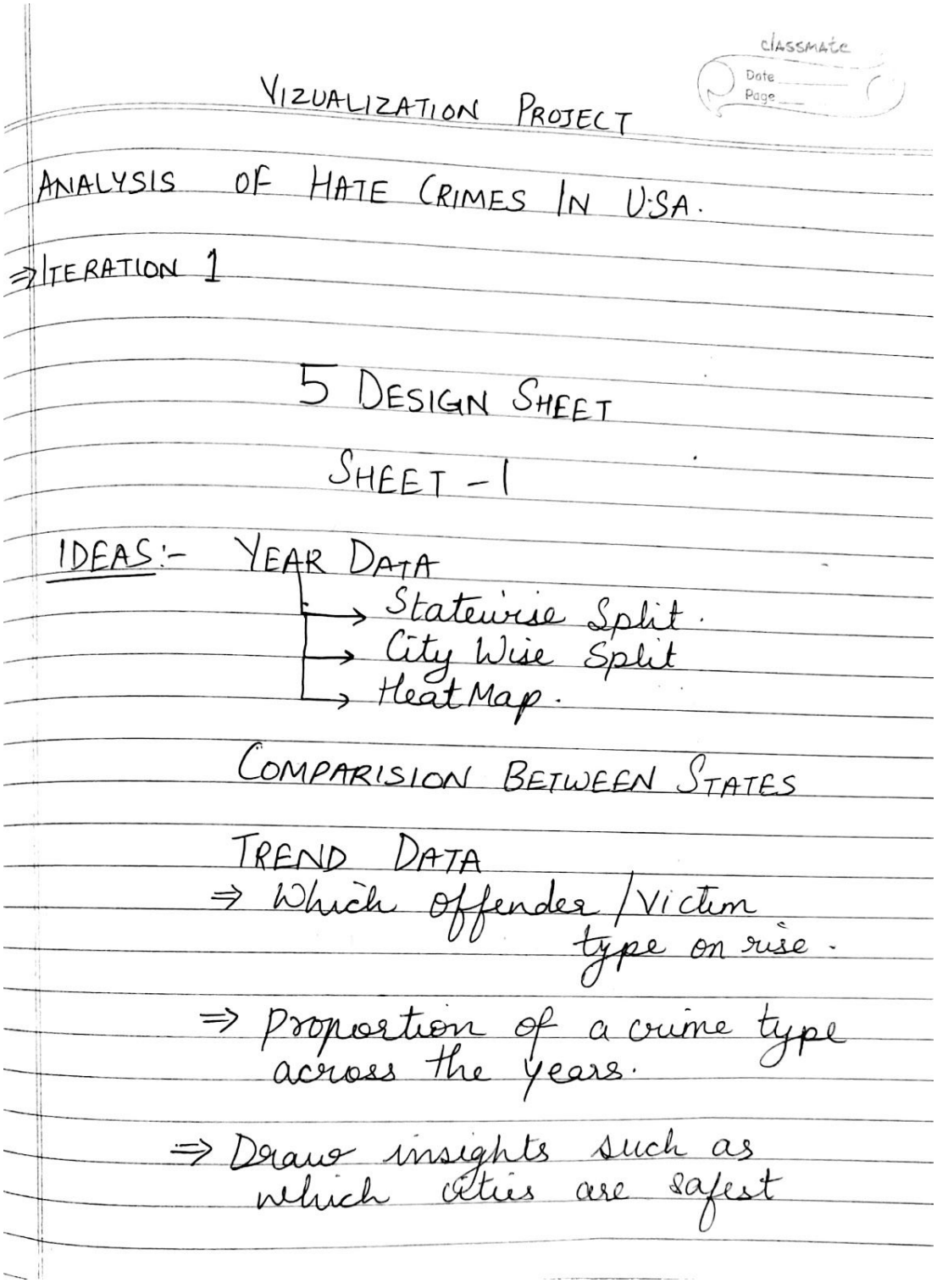
The following images represents a sequential and a iterative process of our thinking.

We have sketched our interpretation of the data representation that according to us would be the most apt in visualizing the data.

We have thoroughly analyzed our data set to show each entity true to its data value that it encodes.

We have followed the standard design guidelines to the best of our capabilities to minimize any form of discrepancies between the data and its realization.

Each chart and or diagram has been carefully sketched, keeping in mind the larger demographic of users and using the most suitable Marks and Channels.



VIZUALIZATION PROJECT

ANALYSIS OF HATE CRIMES IN U.S.A.

⇒ ITERATION 1

5 DESIGN SHEET

SHEET - 1

IDEAS:- YEAR DATA
- → Statewise Split.
- → City Wise Split
- → Heat Map.

COMPARISION BETWEEN STATES

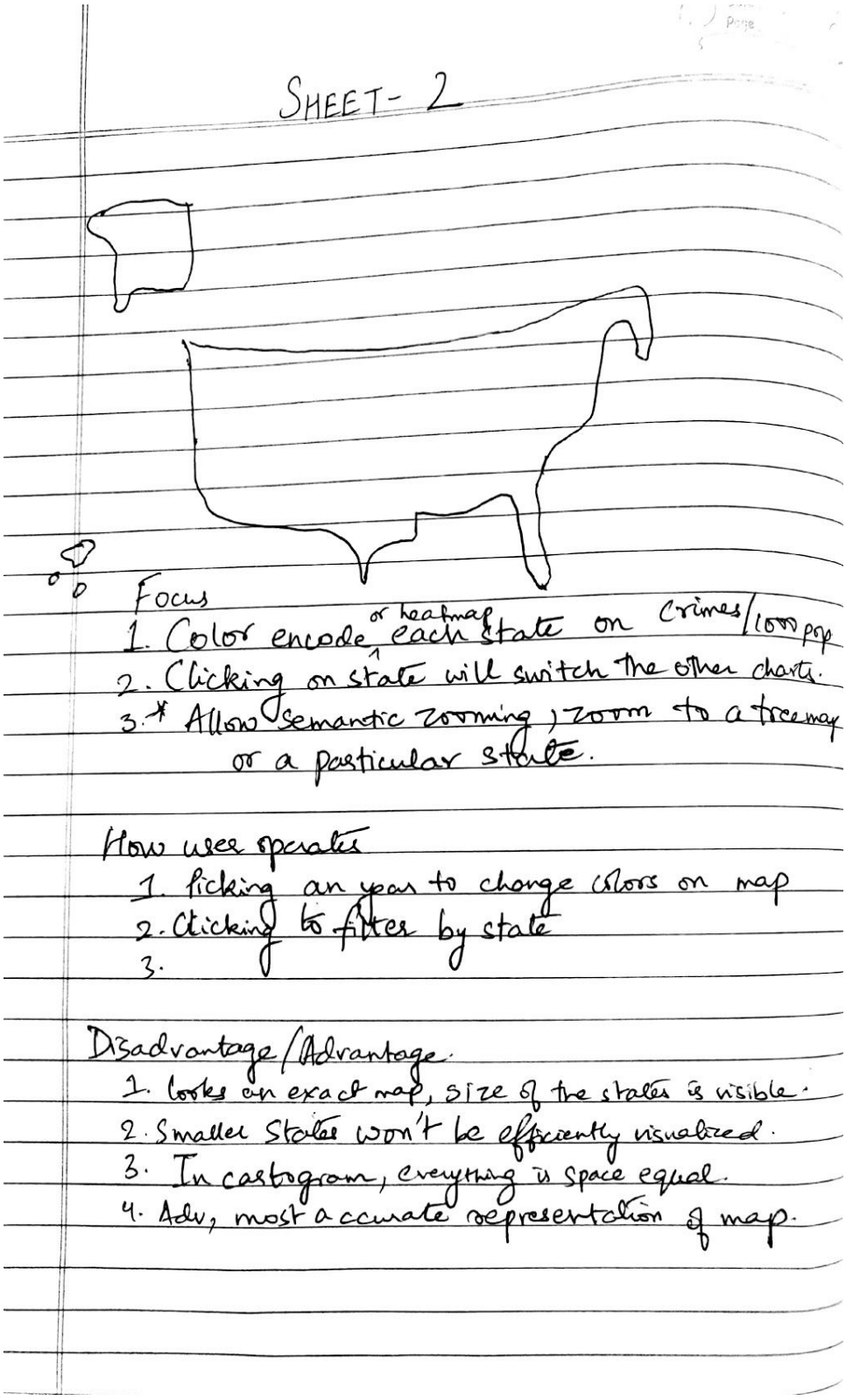
TREND DATA

⇒ Which offender / victim type on rise.

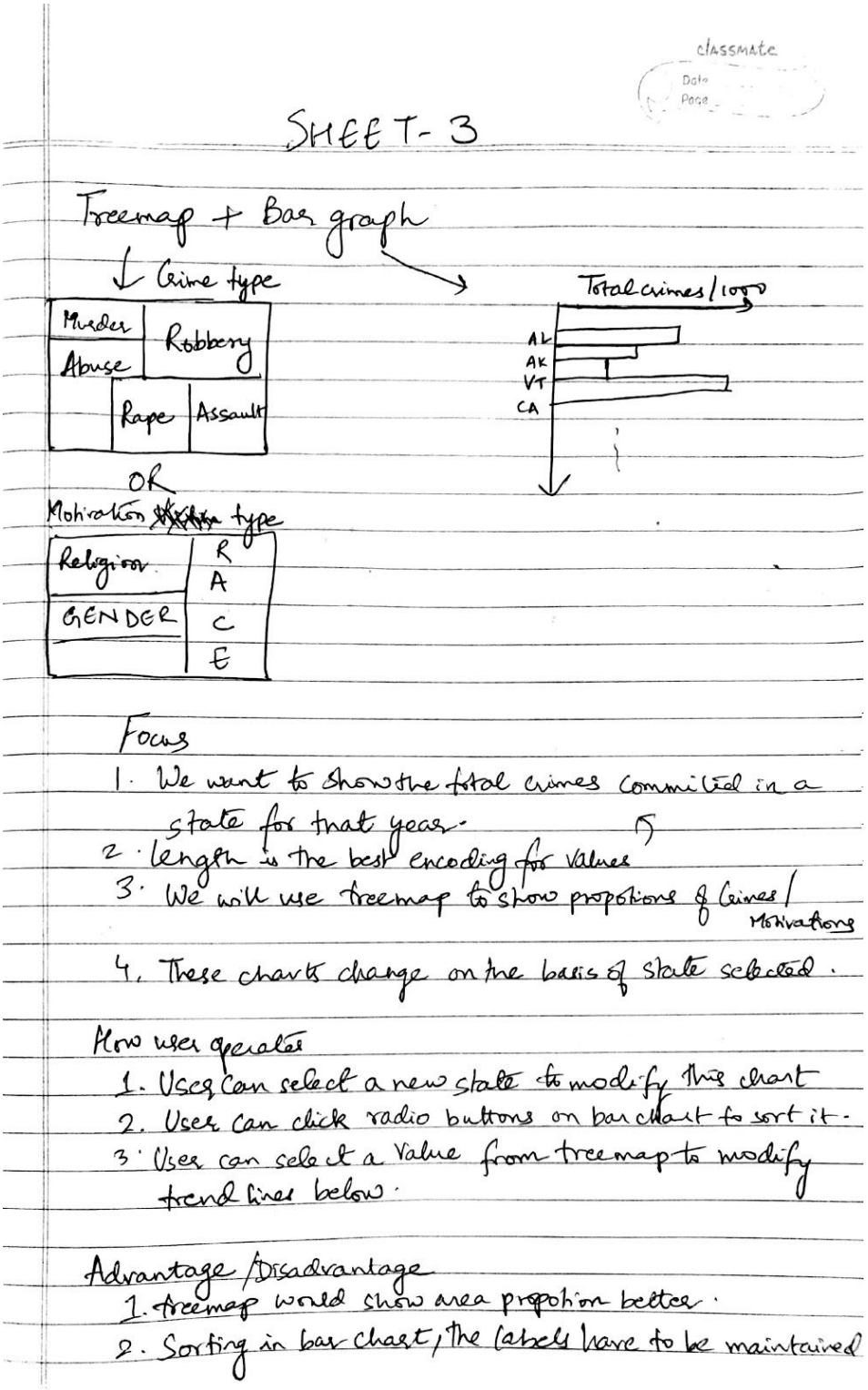
⇒ proportion of a crime type across the years.

⇒ Draw insights such as which cities are safest

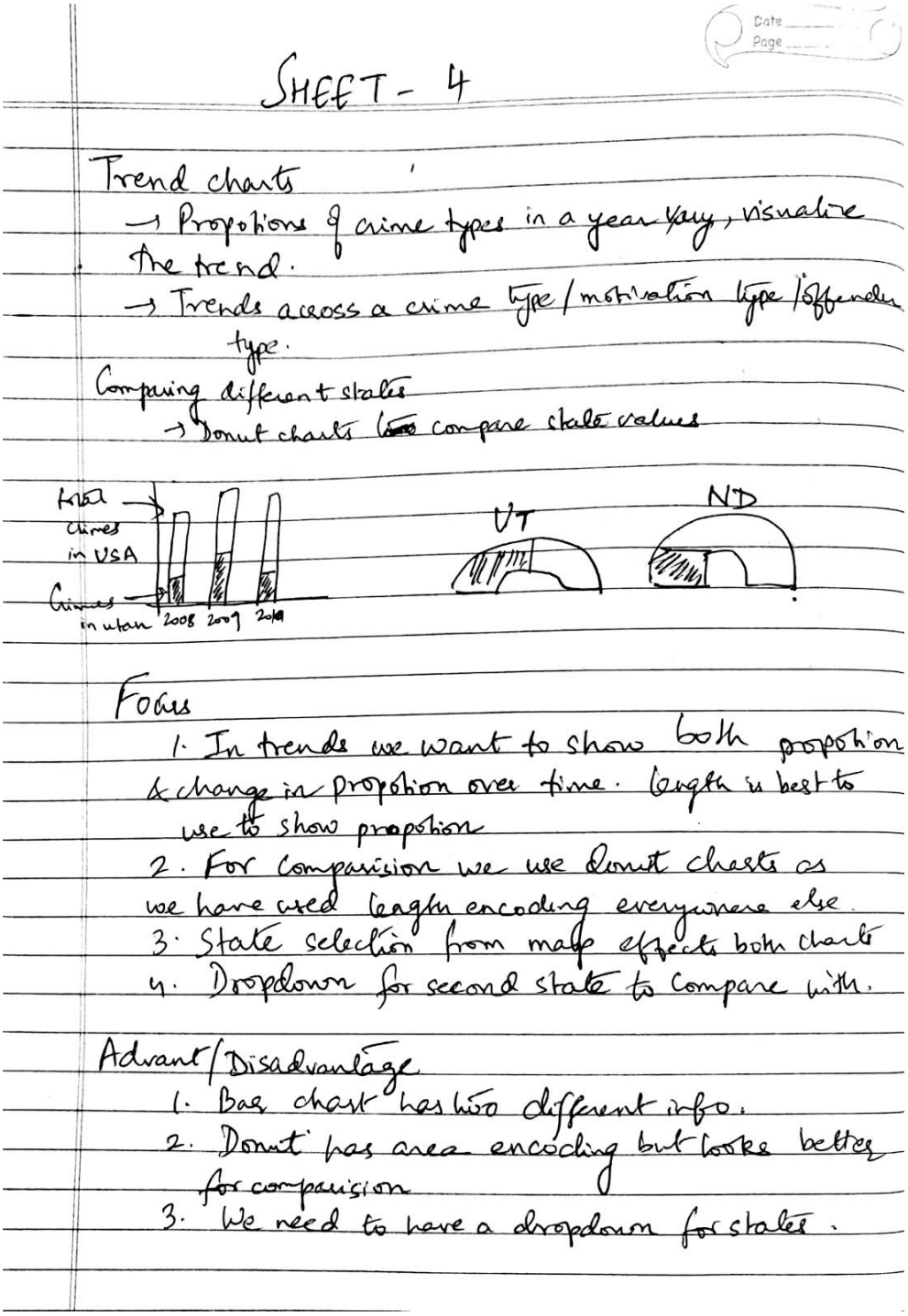
The above image shows the **Sheet 1 of 5** Design Sheet Methodology.



The above image shows the **Sheet 2 of 5** Design Sheet Methodology.



The above image shows the **Sheet 3 of 5** Design Sheet Methodology.



SHEET - 4

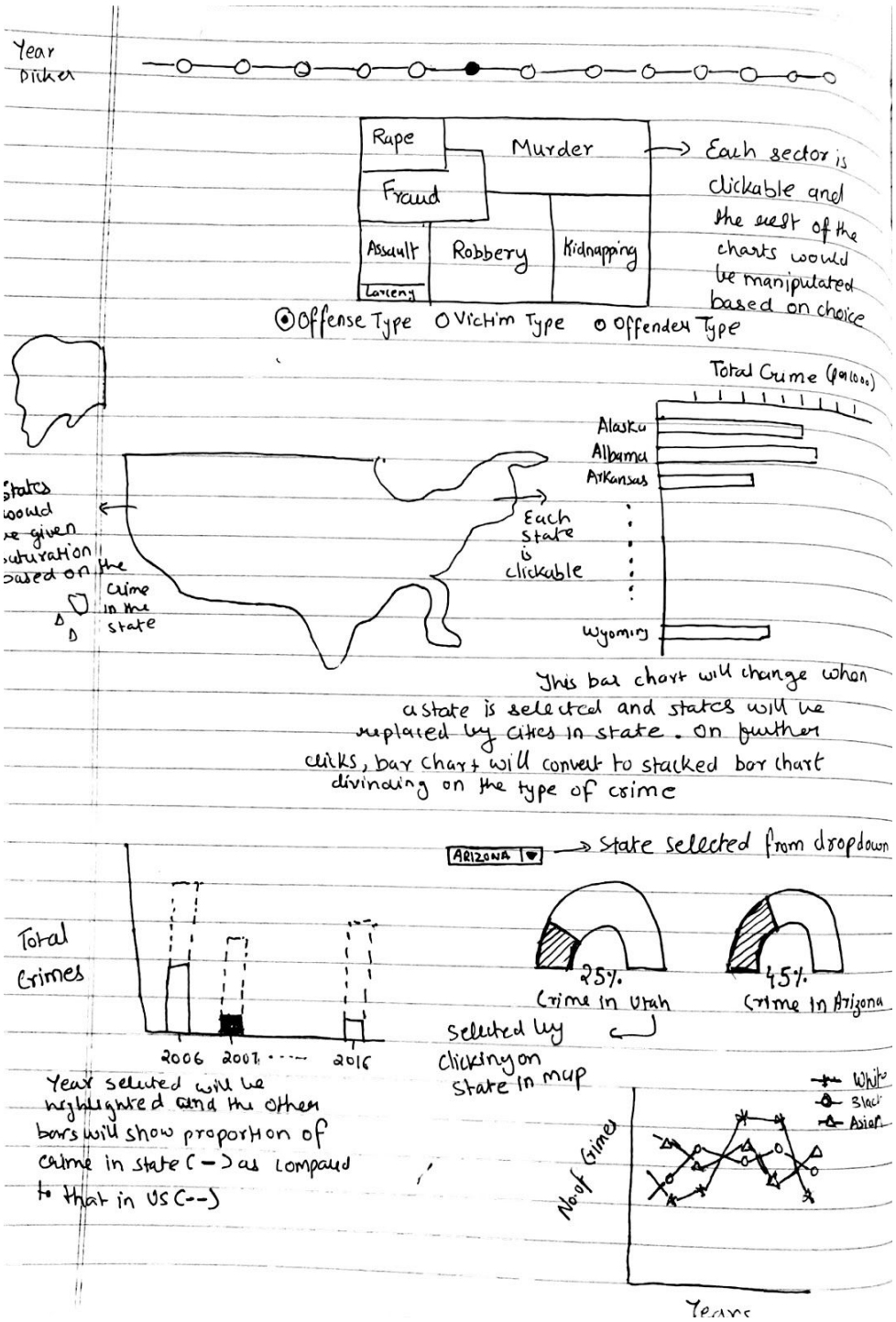
Trend charts
→ Proportions of crime types in a year say, visualize the trend.
→ Trends across a crime type / motivation type / offender type.

Comparing different states
→ Donut charts to compare state values

Focus
1. In trends we want to show both proportion & change in proportion over time. Length is best to use to show proportion
2. For comparision we use donut charts as we have used length encoding everywhere else.
3. State selection from map effects both charts
4. Dropdown for second state to compare with.

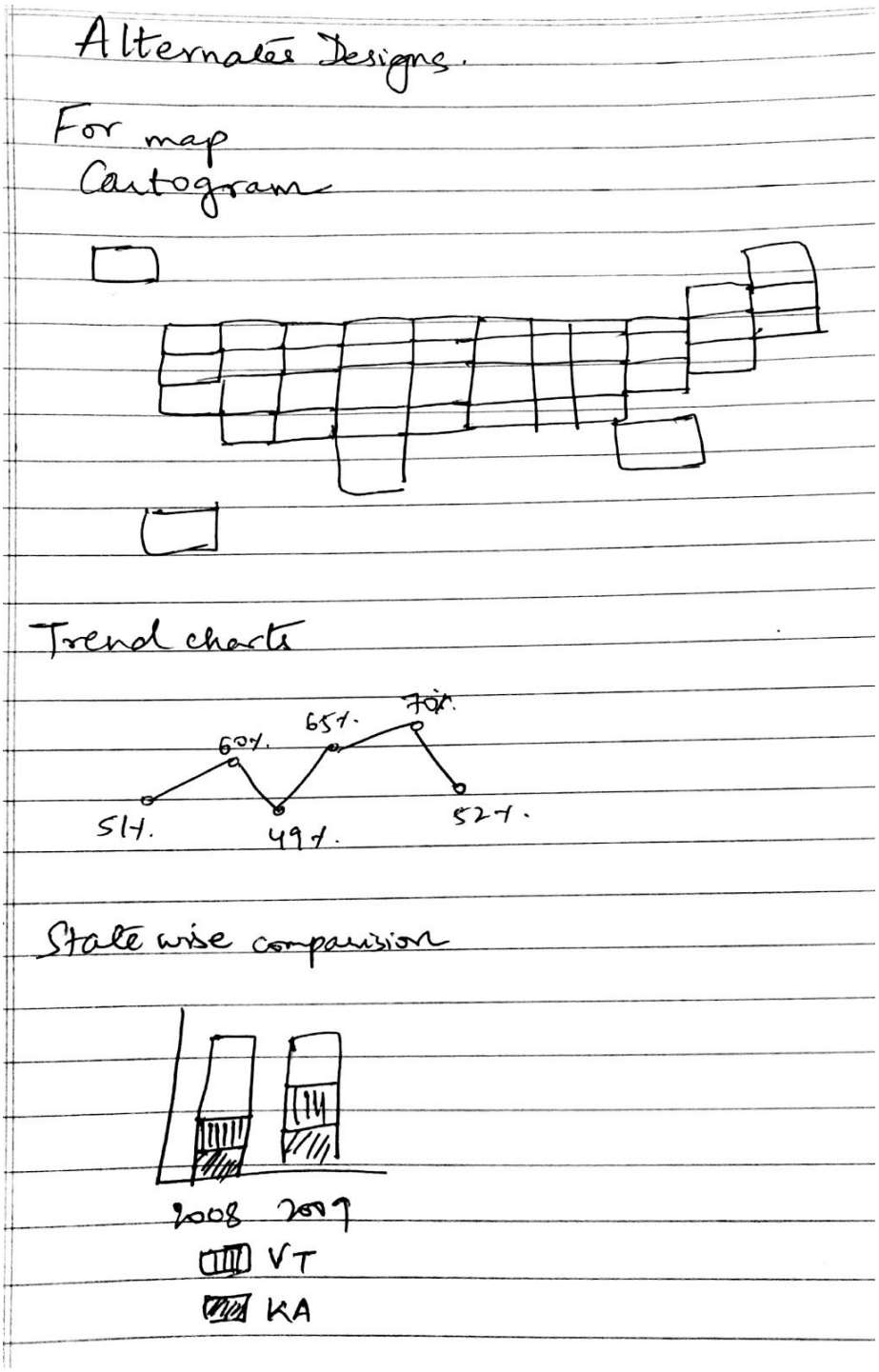
Advant/Disadvantage
1. Bar chart has two different info.
2. Donut has area encoding but looks better for comparision
3. We need to have a dropdown for states.

The above image shows the **Sheet 4 of 5** Design Sheet Methodology.



The above image shows the **Sheet 5 of 5** Design Sheet Methodology.

Alternative Designs



Must Have Features

A. An **year picker** to pick dataset from **different years.**
B. A chart to view the different proportions of **Crime-Motivations/Offense Types/Victim Types.** (Preferably a **Treemap**)
C. A **geographical view of the crimes**. (Geographical chart of US color coded by total crime values).
D. A **mechanism to compare different states** based on crime values (Preferably **Donut Chart**)
E. A chart to visualize the trends across states and crime types (Preferably **Line charts**)

Optional Features

A. **Sorting of the bar charts** of states on the basis of **Total Crimes/ Motivation Types** etc.
B. **Semantic zooming** on a state's geographical chart when it is selected on the map. then we color the cities instead of the states.
C. Additional **text field** showing the news articles about the crime.

Milestones

I. As part of the first 2 week milestone, we will finish

A. Initial setup of HTML, CSS and JS files.

B. Year picker Chart.

C. Splitting of the data into different csv for our charts.

D. Treemap showing the the various Bias/Motivation types for the hate crimes.

E. A geographical map of the united states, color coded by the total crime values.

F. A bar graph which depicts a State/City -> Total Crime chart.

II. Our final layout, in addition to the charts above will include the following

A. A line chart depicting the proportion of offender types over the years.

B. The Treemap can control the values displayed in the other charts.

C. Trend charts below the geographical map depicting the change in proportions over the years. This would be done using a combination of bar charts.

D. Donut charts to facilitate the comparison of states.

E. Line charts depicting the proportion of offender types over the years , proportion of Bias/Motivation type over the years and proportion of crime type over the years.