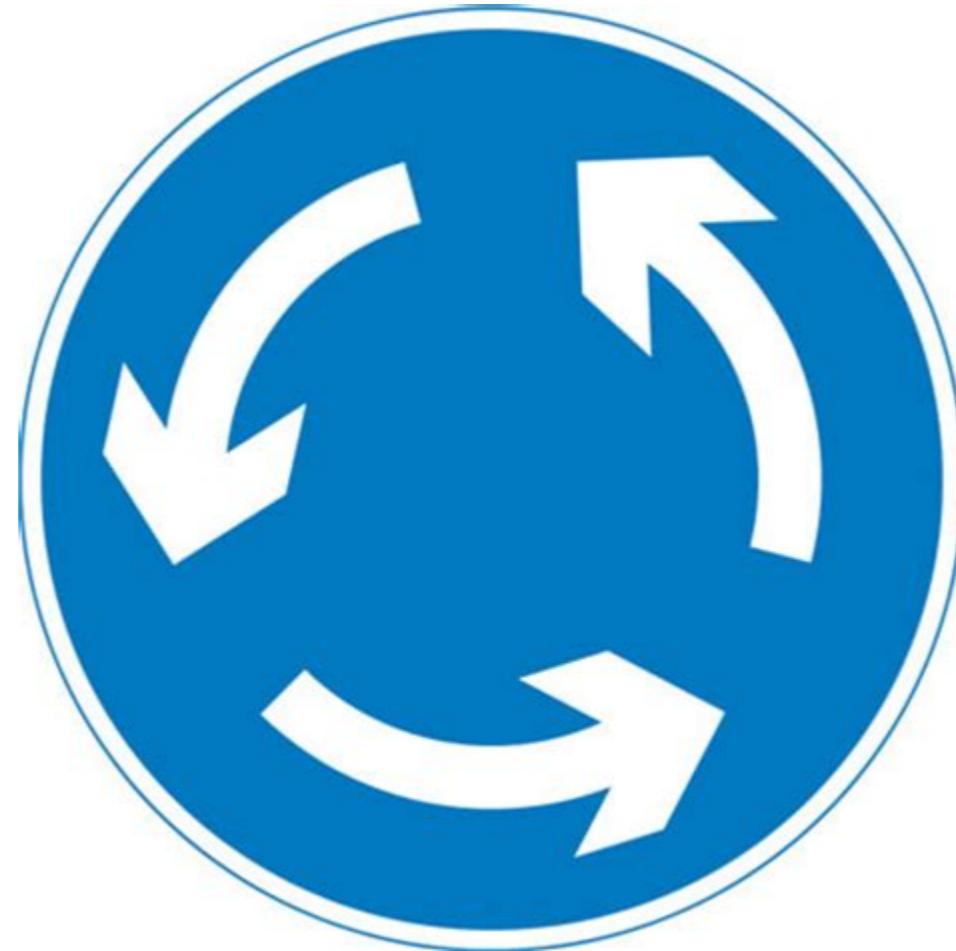


Identifying dangerous intersections for conversion into roundabouts



Ignasi Sols

Introduction

38,680

Deaths in traffic accidents in the USA, 2020

+

4.5M

Injured seriously enough to require medical attention, USA, 2019

Introduction

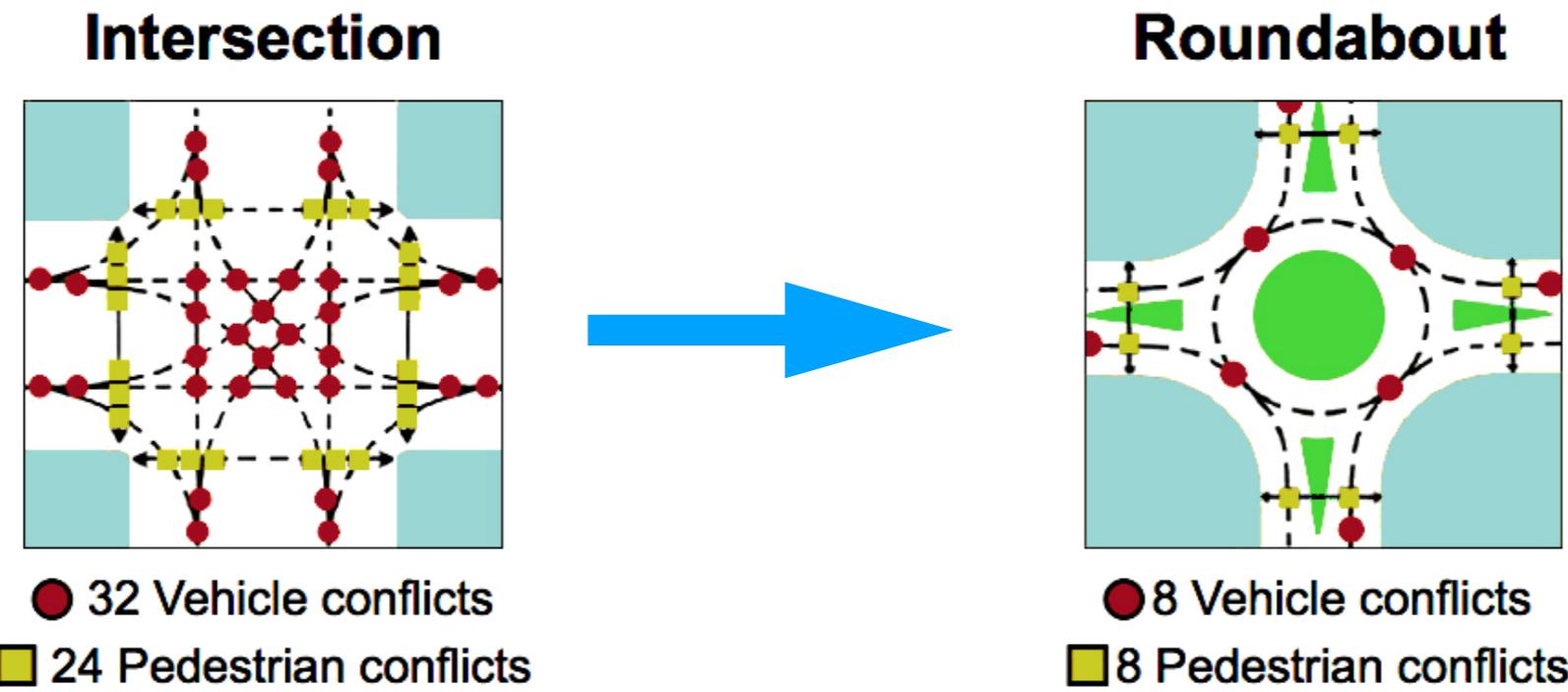
~ 40% US accidents
happen at intersections





Business impact: to reduce the number of accidents, injuries and deaths in US intersections.

Why conversion into roundabouts is a good idea



Impact hypothesis:

Converting dangerous intersections into roundabouts will reduce the number of accidents, injuries and deaths.

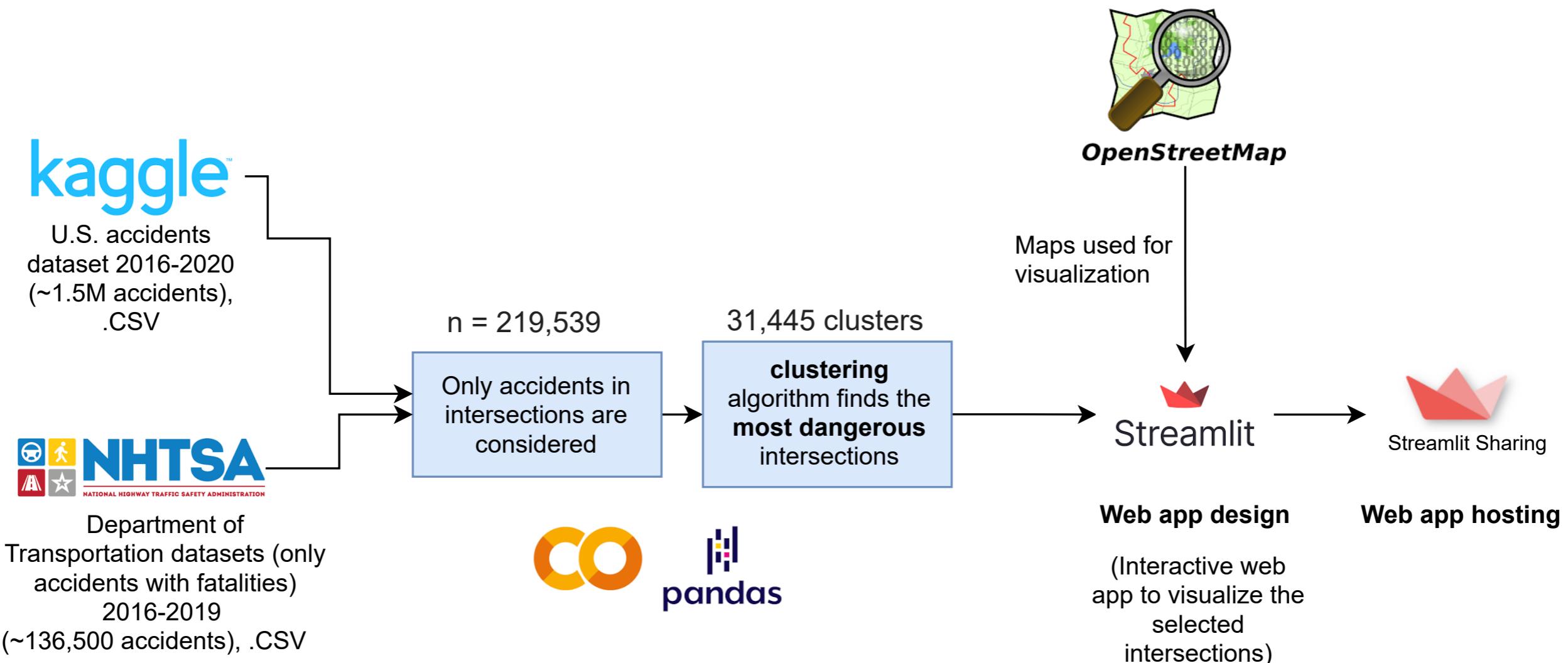
↓ 65% Deaths

↓ 40% Injuries

(Elvik, 2017)

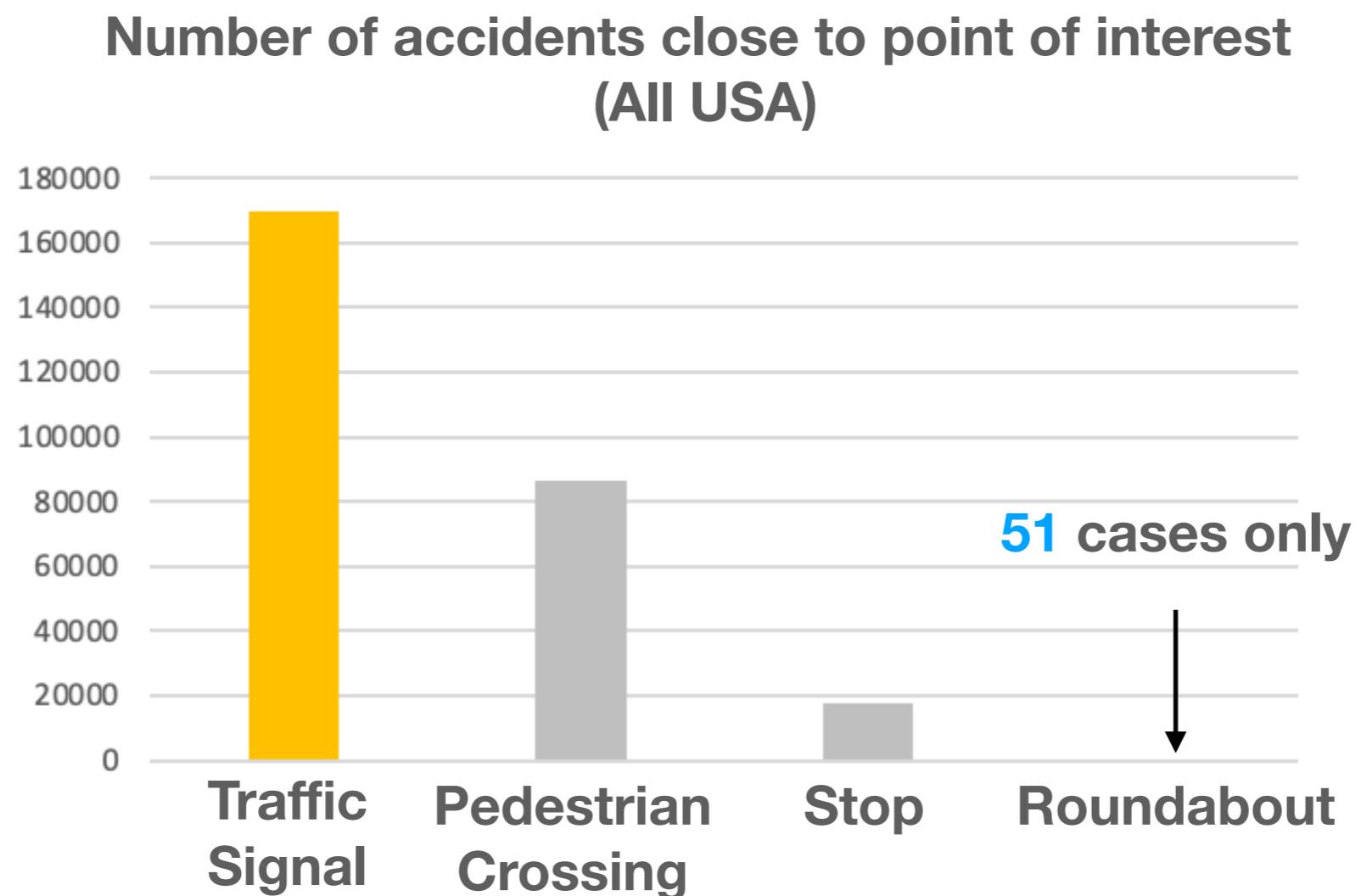
Data Science Goal:

Identify the most dangerous intersections in Pennsylvania, and an interactive tool for the Department of Transportation.



Assumptions/Risks

-Reducing the number of accidents will reduce the number of deaths and injuries.



-Some particular intersections might not be suitable for conversion into roundabouts.

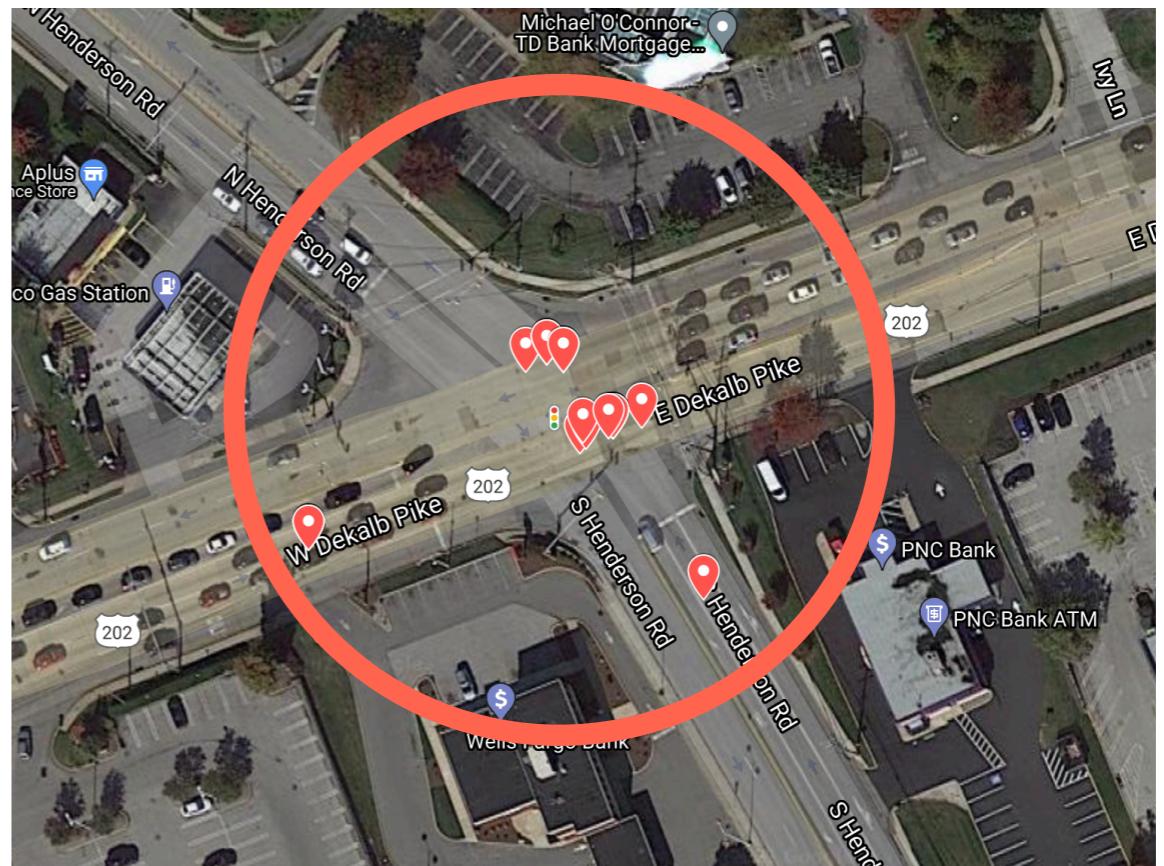
Data Science path:

Build a custom algorithm that **clusters** different accidents based on their coordinates, identifying specific intersections.

219,539 accidents

Custom
clustering
algorithm

31,445 intersections





Dangerous intersections in the USA

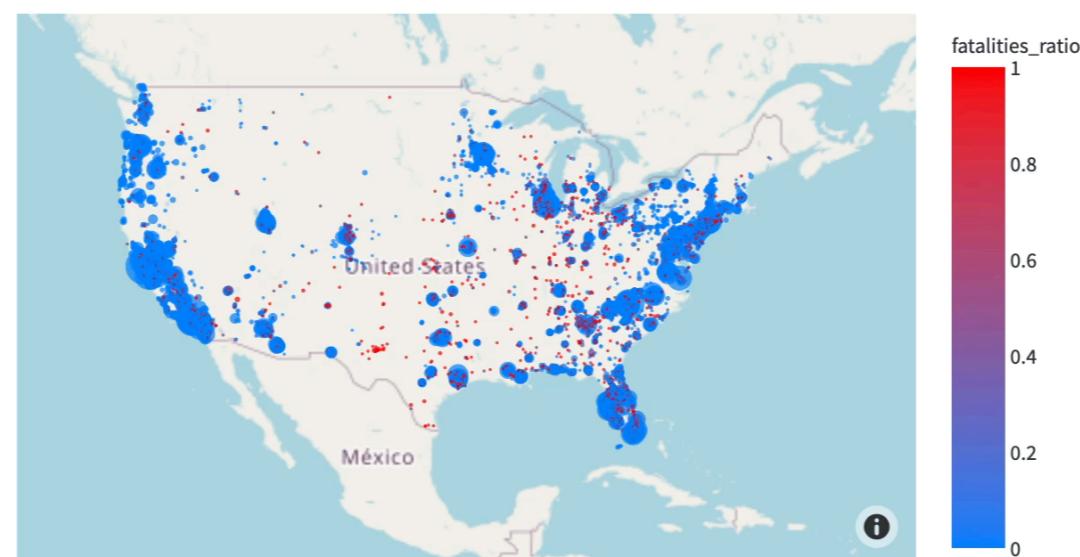
Choose a State

Choose a County

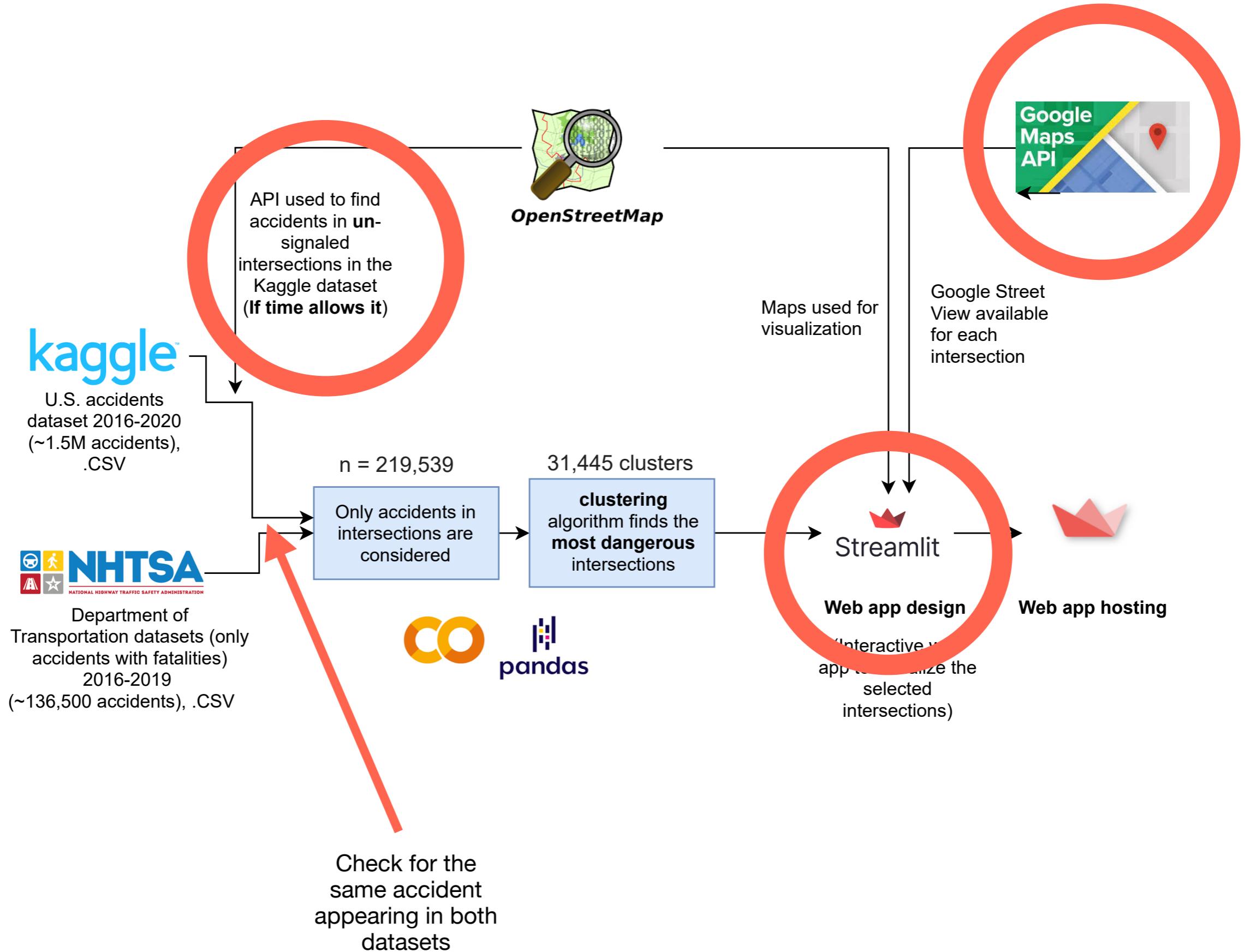
Choose a City

Pick one

- All intersections
- Only intersections with fatalities



Future directions:



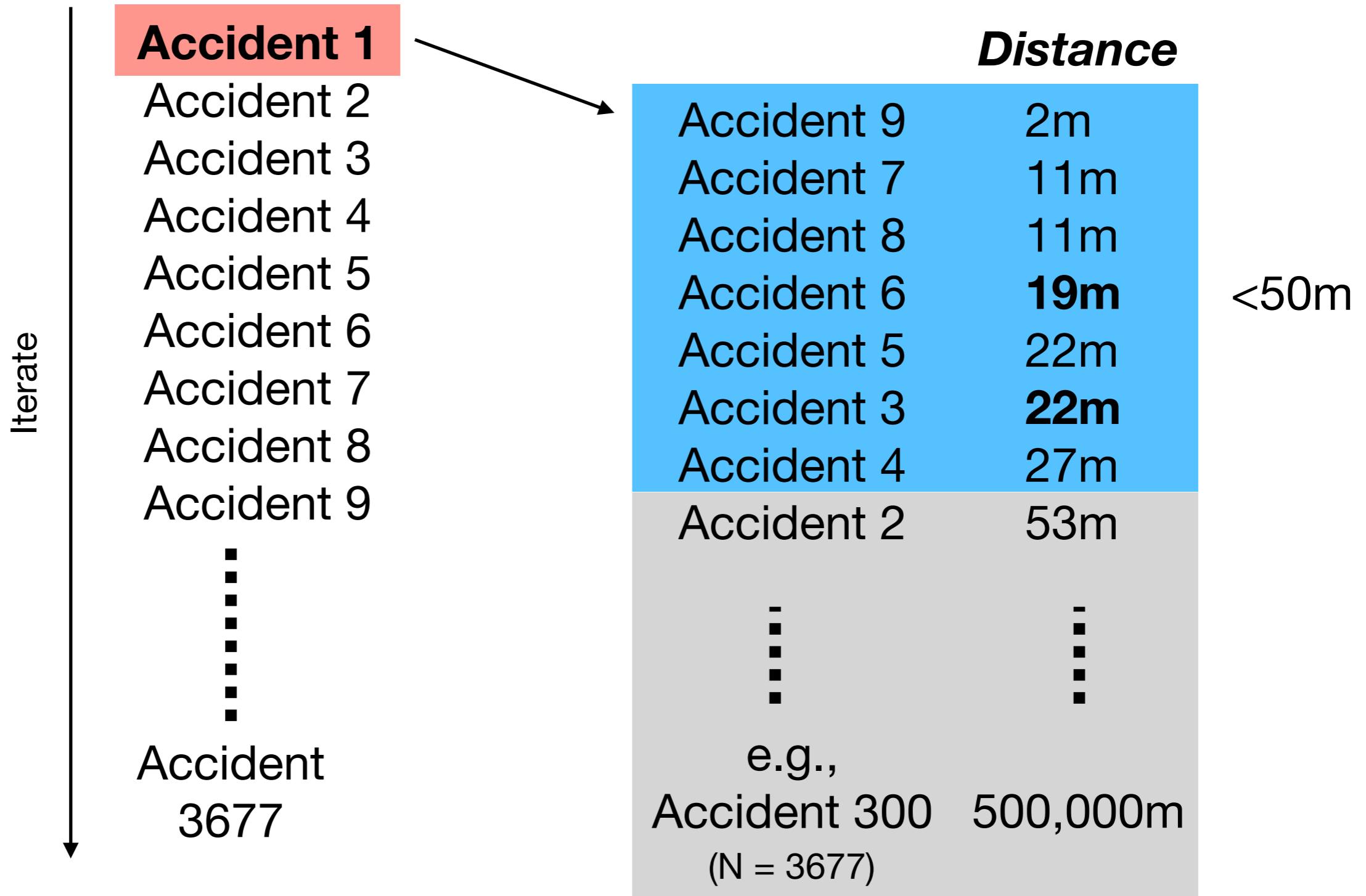
Future directions:

- Add Google Street Maps
- Include accidents at **stops** and **crossings**.
- ML classification model that learns to classify dangerous intersections, including more features like number of roads crossing and lanes.
- Plotly or Bokeh for dashboard.

Thanks!

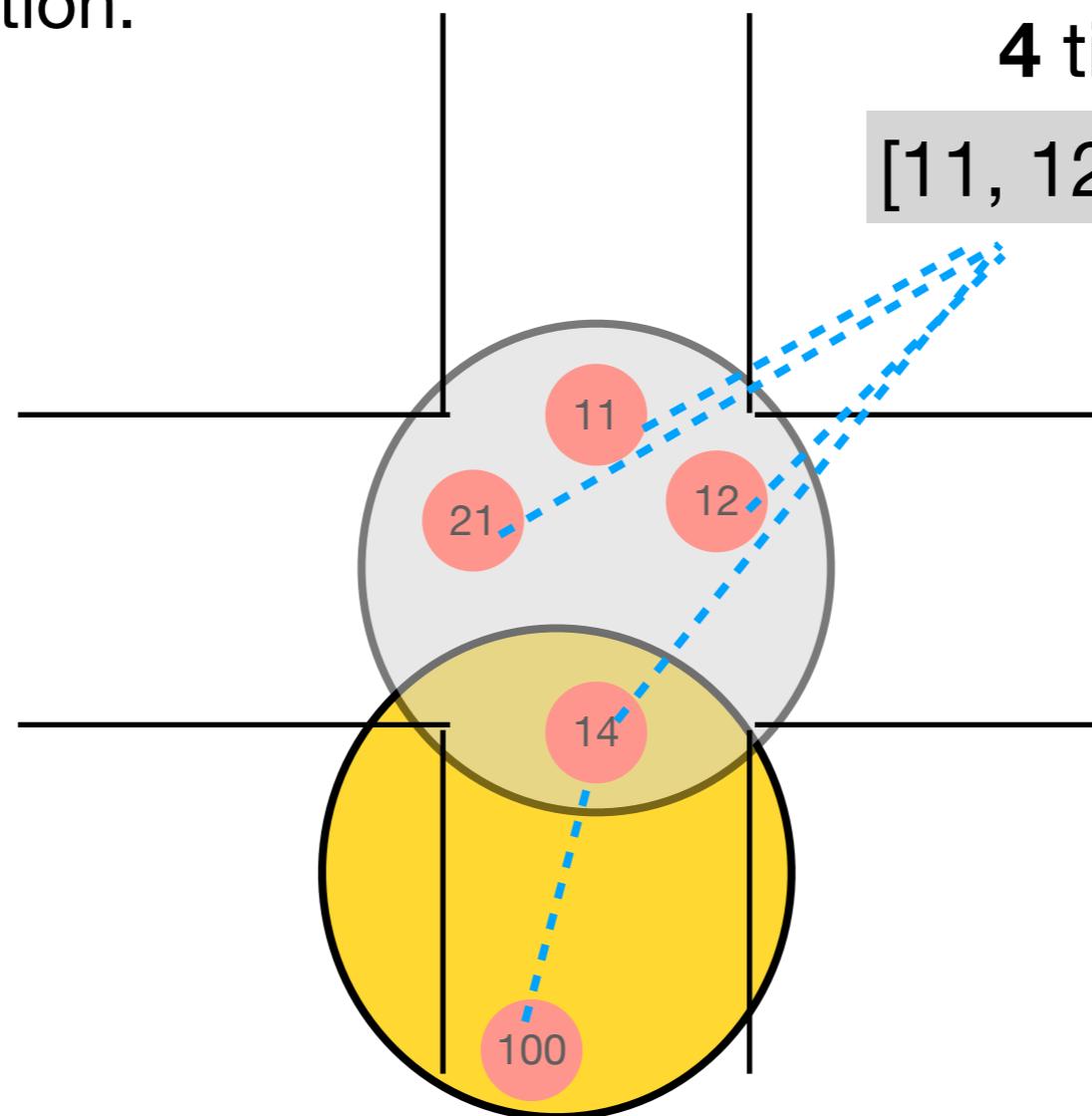
Appendix:

Algorithm explanation:



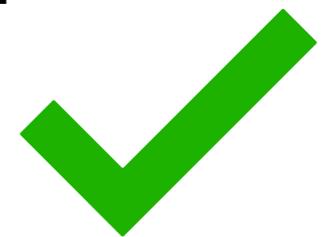
Appendix:

Algorithm explanation:



Unique set repeated
4 times:

[11, 12, 14, 21]



unique set repeated
2 times:

[14, 100]

