COVID-19 Management: Preparation & Response
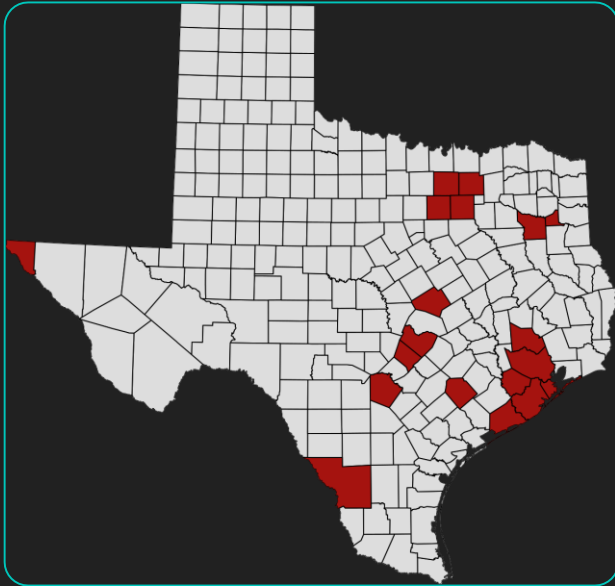
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COVID-19

- COVID-19 is the deadliest pandemic since the Spanish Flu from over 100 years ago

- Suppliers are short on medical supplies

- The best way to allocate resources and mitigate spread of COVID-19 needs to be identified

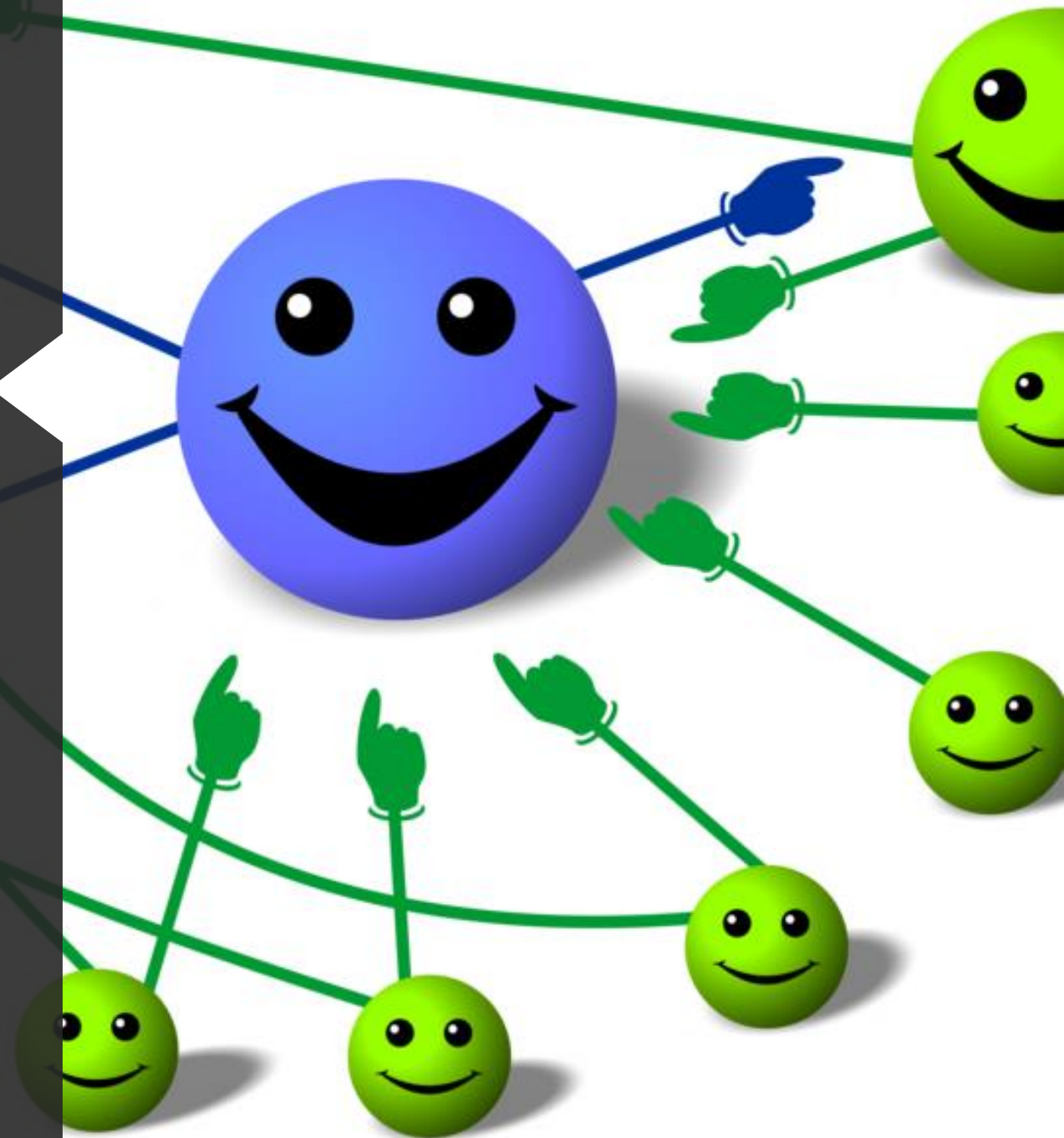- The COVID-19 Management System can help with this

What does it do?

- COVID-19 Management System is an intelligent system that identifies the critical areas (case study: Texas) where actions need to be taken

- This system ranks counties based on the risk they pose of spreading the virus to neighboring counties

How is this done?

- This idea implements clustering along with the PageRank algorithm

- Clustering identifies 4 clusters based on the dataset we prepared

- PageRank uses the clustering prediction to identify which counties risk spreading the virus further
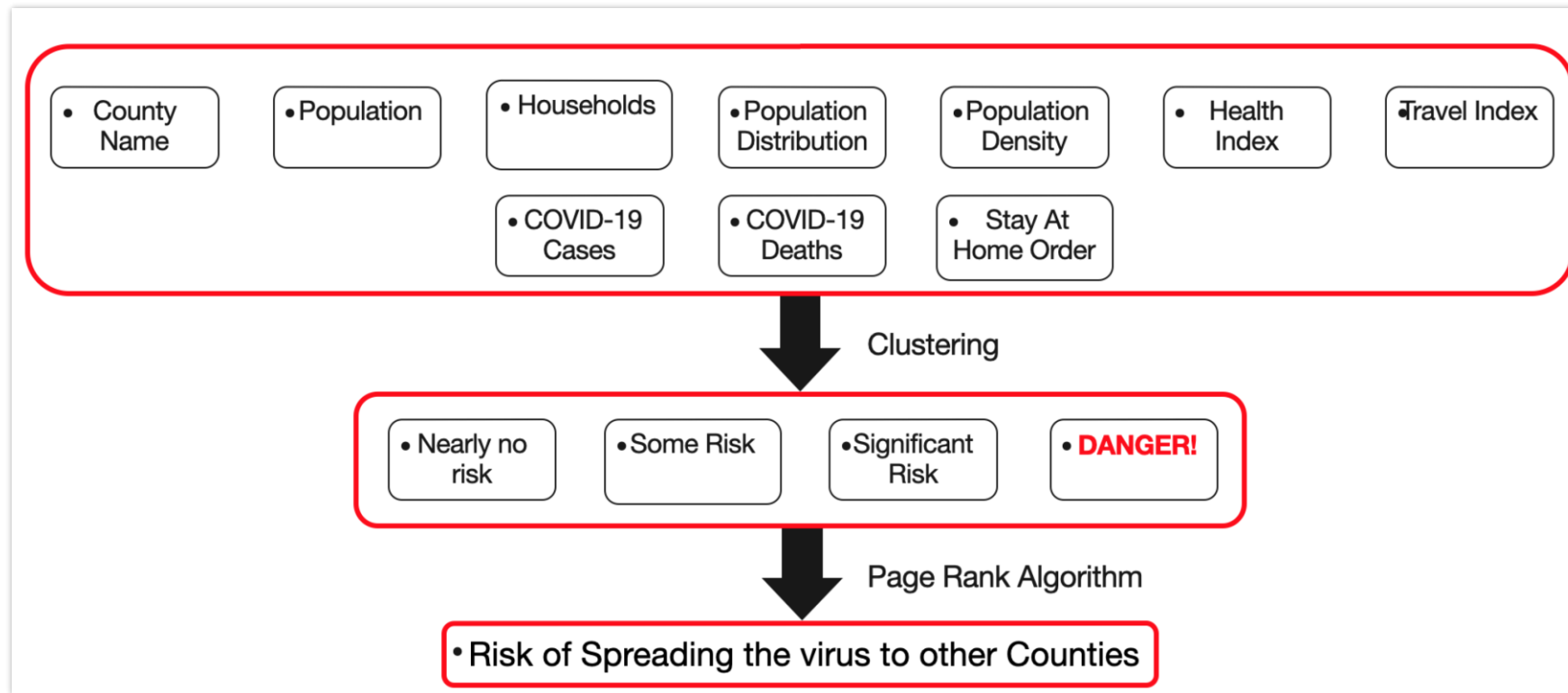
Why is this done?

- There is a shortage of medical personnel and testing kits across the country

- The categorization of counties helps in effective allocation of resources

- The prediction of how counties will be affected in the future leads to better preparedness to mitigate the virus

Diagram of code

Results

County	COVID-19	Labels
Aransas	2	Nearly No Risk
Archer	0	Nearly No Risk
Austin	2	Nearly No Risk
Bandera	0	Nearly No Risk
Baylor	0	Nearly No Risk

County	COVID-19	Labels
El Paso	40	Some Risk
Hidalgo	28	Some Risk
Wichita	28	Some Risk
Nueces	22	Some Risk
Cameron	20	Some Risk

County	COVID-19	Labels
Travis	200	Significant Risk
Denton	165	Significant Risk
Collin	134	Significant Risk
Fort Bend	119	Significant Risk
Galveston	70	Significant Risk

County	COVID-19	Labels
Bexar	157	DANGER!
Dallas	488	DANGER!
Harris	526	DANGER!
Tarrant	139	DANGER!

Page Rank Algorithm

Dallas County   Gillespie County   Wheeler County

Novelty

- Everyone around the world is trying to figure out a way to combat the pandemic

- The novel approach of using Clustering and PageRank together would help us understand where the risk lies

- The results obtained from this algorithm would help us in the fight against the COVID-19 pandemic

Future Work

- Extend the algorithm to the whole country by collecting data from all counties

- Use GIS to identify zones on the map for better visualization

- Collect more relevant parameters to identify the spread of virus

- Create a similar model for pandemic response and disaster response to help manage similar situations in the future

- Help humanity

Thank You!