The Big Lab

Group Members

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Theme Song: https://youtu.be/Pt28Ex-ta0E

- **[Problem]**
  - How prevention methods (social distancing, wearing mask, washing hands) affect the infection curve in a community
- **[Intervention]**
  - Social distancing, wearing mask, washing hands and the ones without any prevention methods
- **[Goal(s)]**
  - Analyze and visualize how the disease propagates amongst groups with different behaviors in a population
  - Set a ranking of the prevention methods

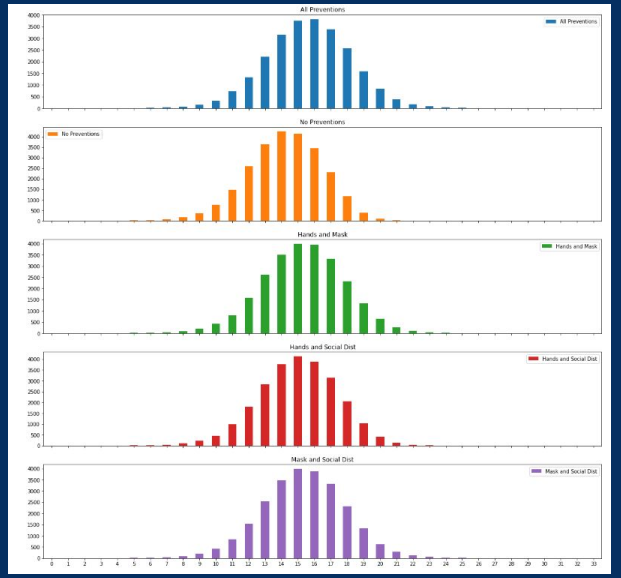
Our code

- We added variables to manage the groups in our population based on a counter. Plus we changed the risk of infection of each individual in the population based on the usage of prevention methods and how much they decreased the risk of infection.
- Group Github Repo Link https://github.com/revv-tech/Hackaton_TheBigLab.git

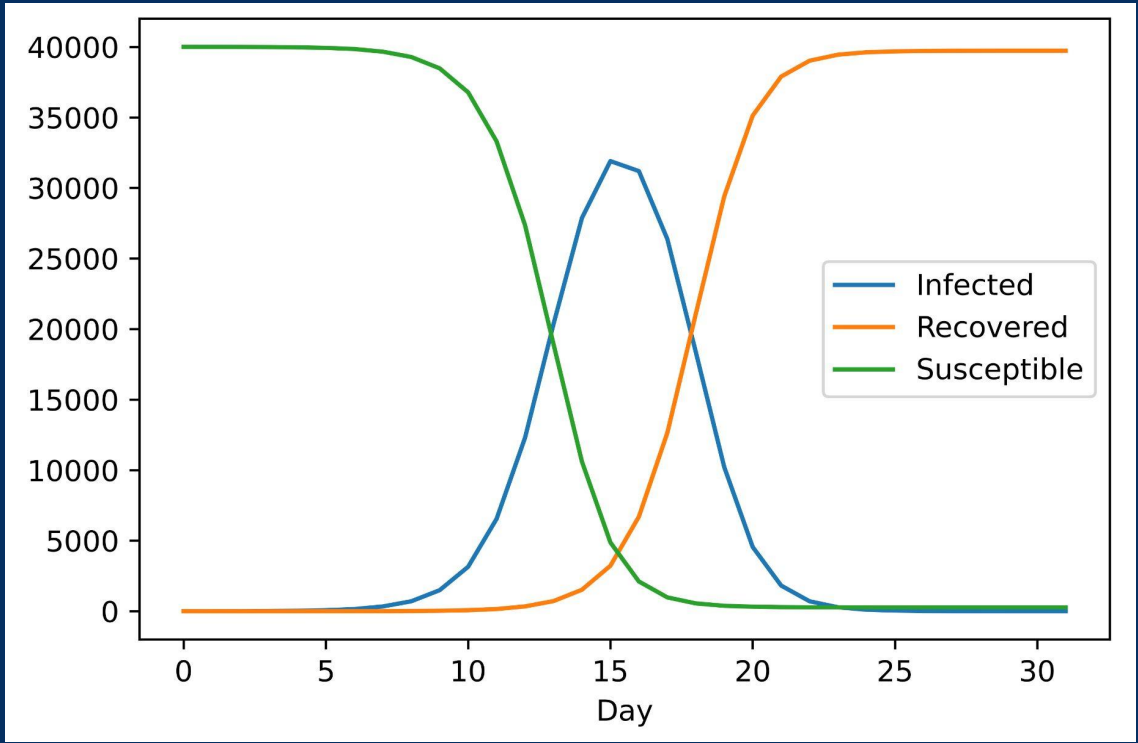
Our code

- ★ The main function of our code was one called set_data_lists(), and its purpose was to divide in groups our total population based on the person's state. We called this function for each day.
- ★ We manipulated the data using pandas dataframe and stored them using csv files.
- ★ We developed the plots using matplotlib and pandas.

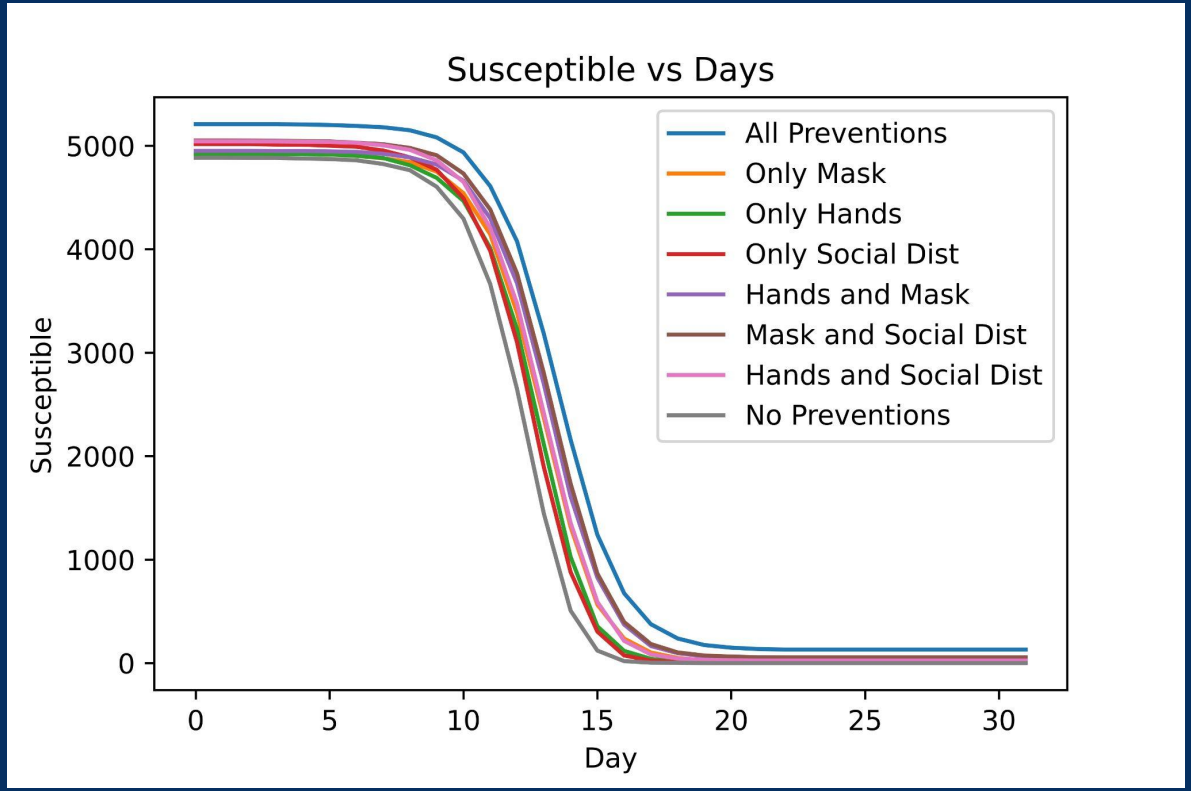
	Day	Susceptible	Infected	Recovered	All Preventions	No Preventions	Only Hands	Only Mask	Only Social Dist	Hands and Mask	Hands and Social Dist	Mask and Social Dist
0	0	40001	1	0	0	1	0	0	0	0	0	0
1	1	39998	4	0	1	1	1	0	1	0	0	0
2	2	39994	8	0	1	2	1	0	2	1	0	1
3	3	39985	17	0	1	2	2	0	5	2	3	2
4	4	39961	41	0	1	6	5	3	9	7	4	6
5	5	39910	91	1	5	18	9	7	14	10	16	12
6	6	39812	186	4	15	35	18	18	31	20	29	20
7	7	39579	415	8	38	78	43	45	67	50	53	41
8	8	39075	910	17	76	177	115	102	141	93	112	94
9	9	38020	1941	41	161	361	263	216	330	199	218	193
10	10	35835	4075	92	329	751	565	458	678	415	470	409
11	11	31644	8168	190	719	1484	1118	909	1294	813	994	837
12	12	24796	14783	423	1331	2587	2016	1680	2270	1574	1795	1530
13	13	16137	22938	927	2218	3629	3081	2665	3352	2609	2838	2546
14	14	8444	29576	1982	3161	4243	3888	3491	4044	3508	3763	3478
15	15	3859	31976	4167	3761	4125	4058	3842	4095	3988	4123	3984
16	16	1736	29908	8358	3826	3447	3698	3642	3599	3956	3868	3872
17	17	895	23901	15206	3397	2312	2841	2939	2622	3329	3132	3329
18	18	555	15582	23865	2565	1174	1724	1942	1475	2316	2060	2326
19	19	418	8026	31558	1578	374	770	1011	596	1333	1038	1326
20	20	347	3512	36143	836	89	296	418	193	648	418	614
21	21	327	1409	38266	380	17	93	159	55	273	138	294
22	22	315	580	39107	182	5	27	65	20	109	49	123
23	23	313	242	39447	89	2	6	20	8	44	16	57
24	24	311	107	39584	48	0	2	8	2	18	6	23
25	25	309	38	39655	18	0	0	4	1	4	3	8
26	26	309	18	39675	8	0	0	1	1	3	1	4
27	27	307	8	39687	1	0	0	0	0	2	1	4
28	28	306	7	39689	2	0	0	0	0	1	1	3
29	29	306	5	39691	2	0	0	0	0	0	1	2
30	30	306	3	39693	2	0	0	0	0	0	0	1
31	31	306	3	39693	2	0	0	0	0	0	0	1
32	32	306	1	39695	1	0	0	0	0	0	0	0
33	33	306	0	39696	0	0	0	0	0	0	0	0



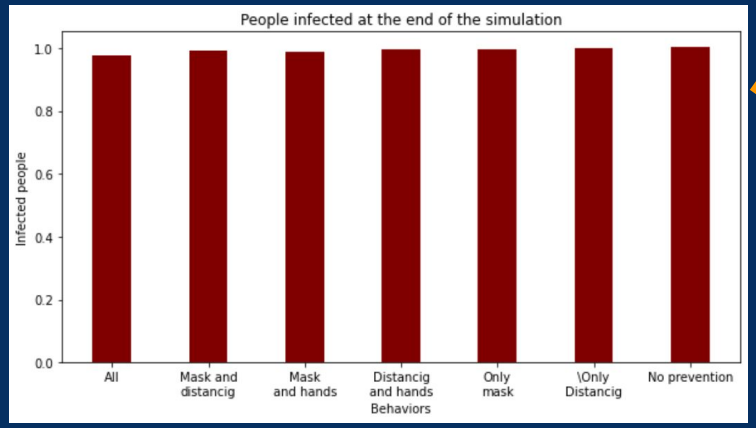
Results

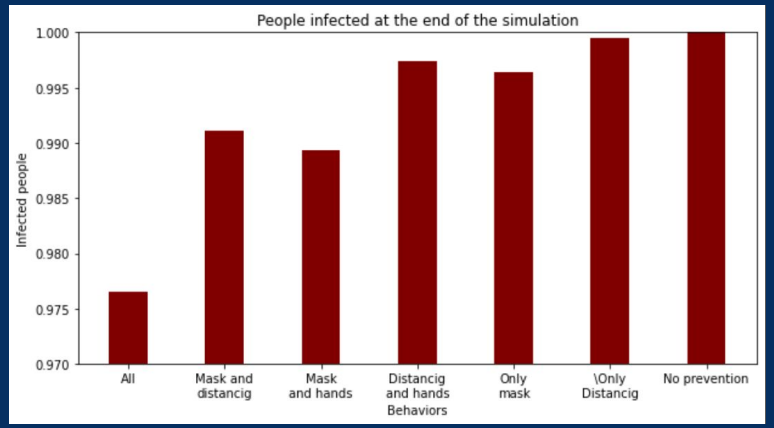

40000
35000
30000
25000
20000
15000
10000
5000
0
0
5
10
15
20
25
30
Day
Infected
Recovered
Susceptible

Results


Susceptible vs Days
All Preventions
Only Mask
Only Hands
Only Social Dist
Hands and Mask
Mask and Social Dist
Hands and Social Dist
No Preventions
Susceptible
5000
4000
3000
2000
1000
0
0
5
10
15
20
25
30
Day

Results


People infected at the end of the simulation
Infected people
1.0
0.8
0.6
0.4
0.2
0.0
All
Mask and distancig
Mask and hands
Distancig and hands Behaviors
Only mask
\Only Distancig
No prevention


People infected at the end of the simulation
Infected people
1.000
0.995
0.990
0.985
0.980
0.975
0.970
All
Mask and distancig
Mask and hands
Distancig and hands Behaviors
Only mask
\Only Distancig
No prevention

Thank you!