visualizer

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1 CPSC 571 Final Project Disease Simulator Visualizer

1.0.1 This code runs the simulator program and outputs graphs to visualize the disease spread.

Authors: Erin Paslawski 10099039 Peter Nguyen 10096424 Bohyeon Cha 10162219

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[1]:
```
import pandas as pd
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
import matplotlib.ticker as ticker
import numpy as np
sns.set()
from simulator import main
```

[21]:
```
main()
```

```
How many days to run the simulator: 75
What percentage of the population is infected at day 0: 10
Numbers of days people are contagious with the disease: 10
```

[2]:
```
all_df = pd.read_csv("sim_out.csv")
all_df['active_per_1000'] = (all_df["active_cases"] / all_df["population"]) *␣
↪1000
all_df['new_cases_per_1000'] = (all_df["new_cases"] / all_df["population"]) *␣
↪1000
```

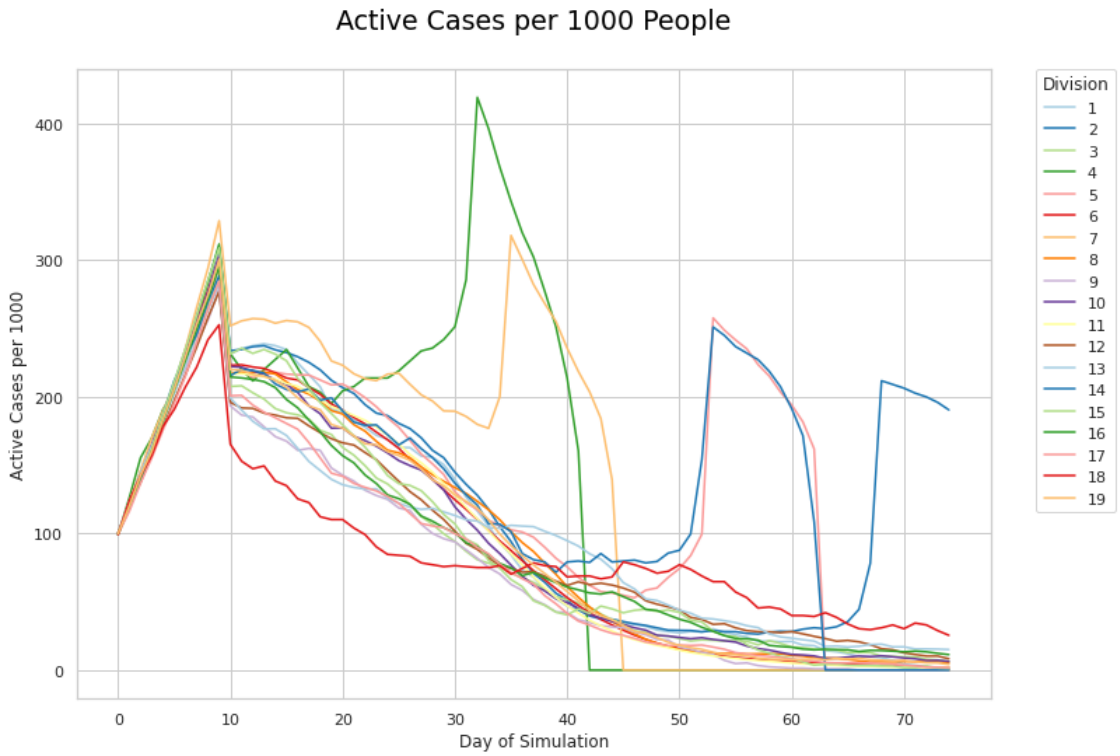
[3]:
```
sns.set_style("whitegrid")
sns.color_palette("Paired")
sns.set(rc={'figure.figsize':(11.7,8.27)})
plt = sns.lineplot(x=all_df['day'],y=all_df['active_cases'], hue =␣
↪all_df['division'],palette="Paired")

# Put the legend out of the figure
plt.legend(bbox_to_anchor=(1.05, 1), loc=2, borderaxespad=0.,title='Division')
plt.set_title("Active Cases",
```

```
            fontsize = 19,
            y=1.05,
            color='black')
plt.set(xlabel='Day of Simulation',
       ylabel = 'Active Cases')
```

[3]: [Text(0.5, 0, 'Day of Simulation'), Text(0, 0.5, 'Active Cases')]

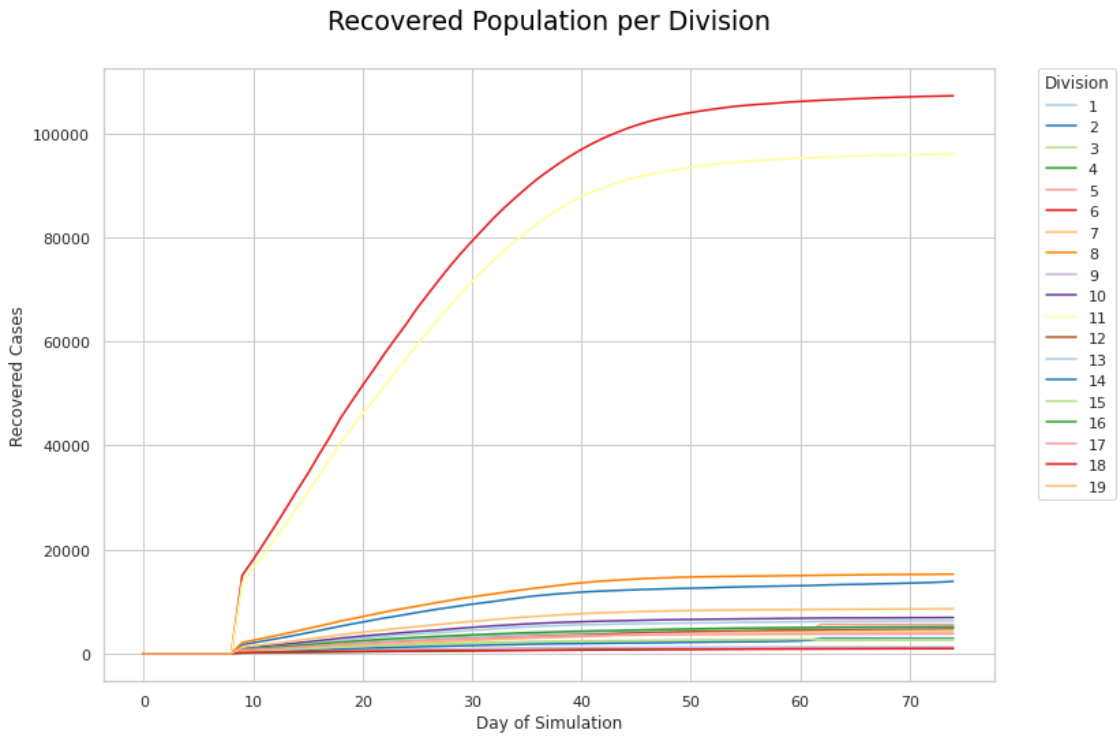
[4]:
```
sns.set_style("whitegrid")
sns.set_palette("Paired")
plt = sns.lineplot(x=all_df['day'],y=all_df['active_per_1000'], hue =␣
 ↪all_df['division'],palette="Paired")
# Put the legend out of the figure
plt.legend(bbox_to_anchor=(1.05, 1), loc=2, borderaxespad=0.,title='Division')
plt.set_title("Active Cases per 1000 People",
            fontsize = 19,
            y=1.05,
            color='black')
plt.set(xlabel='Day of Simulation',
       ylabel = 'Active Cases per 1000')
```

[4]: [Text(0.5, 0, 'Day of Simulation'), Text(0, 0.5, 'Active Cases per 1000')]



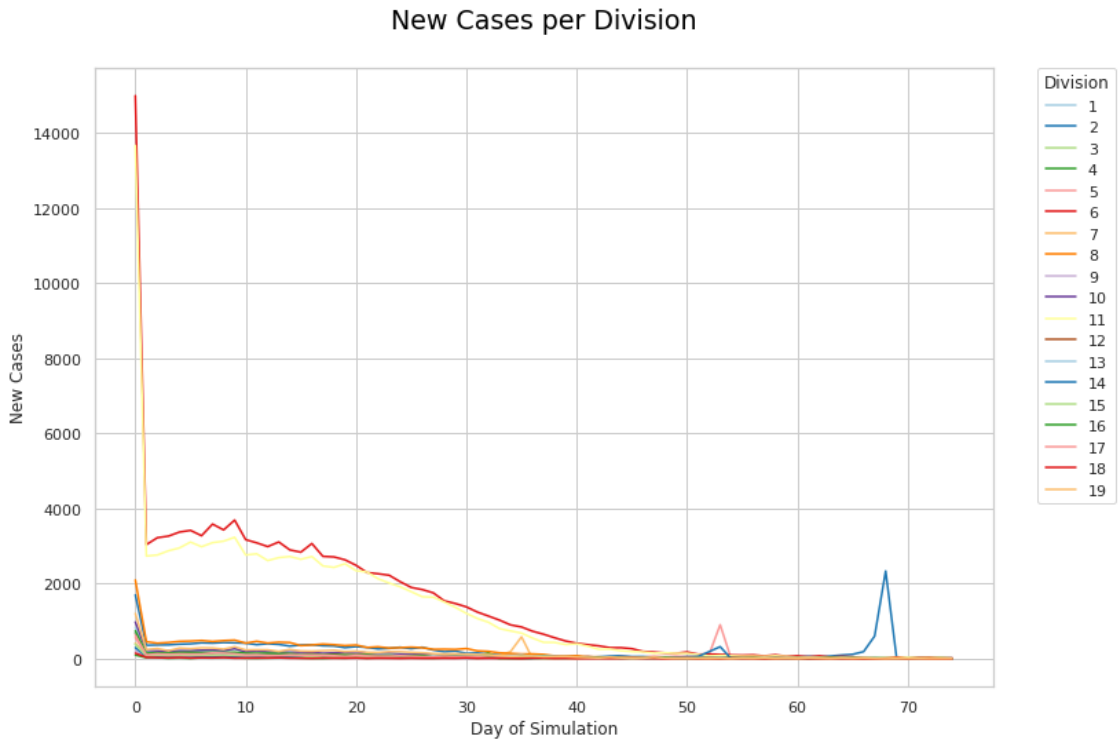
[5]:
```
sns.set_style("whitegrid")
sns.set_palette("Paired")
plt = sns.lineplot(x=all_df['day'],y=all_df['recovered'], hue =␣
 ↪all_df['division'],palette="Paired")
# Put the legend out of the figure
plt.legend(bbox_to_anchor=(1.05, 1), loc=2, borderaxespad=0.,title='Division')
plt.set_title("Recovered Population per Division",
              fontsize = 19,
              y=1.05,
              color='black')
plt.set(xlabel='Day of Simulation',
       ylabel = 'Recovered Cases')
```

[5]: [Text(0.5, 0, 'Day of Simulation'), Text(0, 0.5, 'Recovered Cases')]



[6]:
```
sns.set_style("whitegrid")
sns.set_palette("Paired")
plt = sns.lineplot(x=all_df['day'],y=all_df['new_cases'], hue =␣
↪all_df['division'],palette="Paired")
# Put the legend out of the figure
plt.legend(bbox_to_anchor=(1.05, 1), loc=2, borderaxespad=0.,title='Division')
plt.set_title("New Cases per Division",
              fontsize = 19,
              y=1.05,
              color='black')
plt.set(xlabel='Day of Simulation',
        ylabel = 'New Cases')
```

[6]:
```
[Text(0.5, 0, 'Day of Simulation'), Text(0, 0.5, 'New Cases')]
```



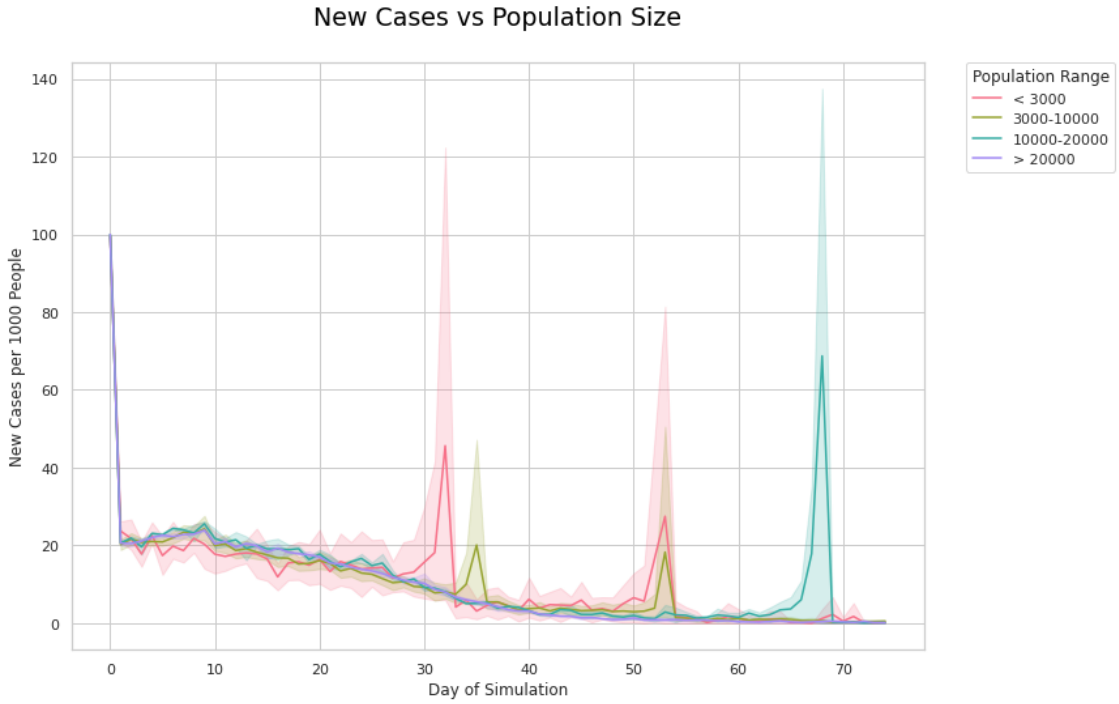
[7]:
```
high_pop = all_df[all_df.population > 20000]
high_pop["pop_range"] = 4
low_pop = all_df[all_df.population < 3000]
low_pop["pop_range"] = 1
high_mid_pop = all_df[(all_df.population <= 20000) & (all_df.population >=␣
↪10000)]
high_mid_pop["pop_range"] = 3
low_mid_pop = all_df[(all_df.population <= 10000) & (all_df.population >= 3000)]
low_mid_pop["pop_range"] = 2

new_df = pd.concat([high_pop, low_pop, high_mid_pop, low_mid_pop])
```

```
/tmp/ipykernel_129/3054894600.py:2: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  high_pop["pop_range"] = 4
/tmp/ipykernel_129/3054894600.py:4: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
```

```
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  low_pop["pop_range"] = 1
/tmp/ipykernel_129/3054894600.py:6: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  high_mid_pop["pop_range"] = 3
/tmp/ipykernel_129/3054894600.py:8: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  low_mid_pop["pop_range"] = 2
```

[8]:
```
sns.set_style("whitegrid")
cpalette = sns.color_palette("husl", 4)
plt = sns.lineplot(x=new_df['day'],y=new_df['new_cases_per_1000'], hue =␣
 ↪new_df['pop_range'],palette=cpalette)
# Put the legend out of the figure
plt.legend(bbox_to_anchor=(1.05, 1), loc=2, borderaxespad=0.,title='Population␣
 ↪Range', labels=['< 3000', '3000-10000', '10000-20000', '> 20000'])
plt.set_title("New Cases vs Population Size",
              fontsize = 19,
              y=1.05,
              color='black')
plt.set(xlabel='Day of Simulation',
        ylabel = 'New Cases per 1000 People')
```

[8]:
```
[Text(0.5, 0, 'Day of Simulation'), Text(0, 0.5, 'New Cases per 1000 People')]
```


New Cases vs Population Size
New Cases per 1000 People
Day of Simulation
Population Range
< 3000
3000-10000
10000-20000
> 20000
0
20
40
60
80
100
120
140
0
10
20
30
40
50
60
70

[ ]: