Forecasting of coronavirus COVID19 epidemic (SIR model)

DISCLAIMER: The model may fail is some situations. In particular, the model may fail in the initial phase and in when additional epidemic stages or outbreaks (not described by SIR model) are encountered. Use it at your own discretion.

Report

```
fprintf('Date: %s\n',datestr(date))
```

```
Date: 23-Mar-2020
```

```
aut = fitVirusCV19(@getDataNYState,'prn','on');
```

```
Epidemic modeling by susceptible-infected-recovered (SIR) model
  Country                       New York State
  Day                           19
Estimated the SIR model parameters
  Contact rate (beta)           1.035 (1/day)
  Removal rate (gamma)          0.493 (1/day)
  Population size (N)           41343
  Initial number of cases (I0)  0
Basic reproduction number (R0)  2.101
Final state
  Final number of cases         33996
  Final number of susceptibles  7346
Daily forcast for 23-Mar-2020
  Total                         19017
  Increase                      3849
Estimated logistic model parameters
  Epidemic size (K)             28431 (cases)
  Epidemic rate (r)             0.542476 (1/day)
  Initial doubling time         1.3 (day)
Estimated duration (days)
  Turning day                   18
  Acceleration   phase          4 (days)
  Deaceleration  phsee          5 (days)
  Total duration                8 (days)
Estimated datums
  Outbreak                      04-Mar-2020
  Start of acceleration         18-Mar-2020
  Turning point                 22-Mar-2020
  Start of steady growth        27-Mar-2020
  Start of ending phase         04-Apr-2020
Statistics
  Number of observations        19
  Degrees of freedom            15
  Root Mean Squared Error       414.606
  R-Squared                     0.992
  Adjusted R-Squared            0.99
  F-statistics vs. zero model   647.707
  p-value                       4.37718e-16
```

Method

Total cases weight	0.5
Infection rate weight	0.5
Objective function value	1924.48
Exit condition (1=OK)	0