```matlab
clear
clc
FileName   = 'Covid19numbers.mat';
FolderName = 'C:\Users\ataso\Documents\MATLAB';
File       = fullfile(FolderName, FileName);
load(File);   % not: load('File')

BelgiumDailyCase=sort(BelgiumCase.Cases,'ascend');
BelgiumDailyDeath=sort(BelgiumDeath.Deaths,'ascend');
FranceDailyCase=sort(FranceCase.Cases,'ascend');
FranceDailyDeath=sort(FranceDeath.Deaths,'ascend');
IndiaDailyCase=sort(IndiaCase.Cases,'ascend');
IndiaDailyDeath=sort(IndiaDeath.Deaths,'ascend');
NorwayDailyCase=sort(NorwayCase.Cases,'ascend');
NorwayDailyDeath=sort(NorwayDeath.Deaths,'ascend');


BelgiumCumulativeCase=cumsum(BelgiumDailyCase)';
BelgiumCumulativeDeath=cumsum(BelgiumDailyDeath)';
FranceCumulativeCase=cumsum(FranceDailyCase)';
FranceCumulativeDeath=cumsum(FranceDailyDeath)';
IndiaCumulativeCase=cumsum(IndiaDailyCase)';
IndiaCumulativeDeath=cumsum(IndiaDailyDeath)';
NorwayCumulativeCase=cumsum(NorwayDailyCase)';
NorwayCumulativeDeath=cumsum(NorwayDailyDeath)';


%prepration for  fillmissing

BelgiumCumulativeCase(88:92)=nan;
BelgiumCumulativeDeath(88:92)=nan;
FranceCumulativeCase(88:92)=nan;
FranceCumulativeDeath(88:92)=nan;
IndiaCumulativeCase(87:91)=nan;
IndiaCumulativeDeath(87:91)=nan;
NorwayCumulativeCase(88:92)=nan;
NorwayCumulativeDeath(88:92)=nan;


ProcessedBelgiumCase=fillmissing(BelgiumCumulativeCase,'linear');
ProcessedBelgiumDeath=fillmissing(BelgiumCumulativeDeath,'linear');
ProcessedFranceCase=fillmissing(FranceCumulativeCase,'linear');
ProcessedFranceDeath=fillmissing(FranceCumulativeDeath,'linear');
ProcessedIndiaCase=fillmissing(IndiaCumulativeCase,'linear');
ProcessedIndiaDeath=fillmissing(IndiaCumulativeDeath,'linear');
ProcessedNorwayCase=fillmissing(NorwayCumulativeCase,'linear');
ProcessedNorwayDeath=fillmissing(NorwayCumulativeDeath,'linear');


plot(ProcessedBelgiumCase);
hold on;
plot(ProcessedBelgiumDeath);
```
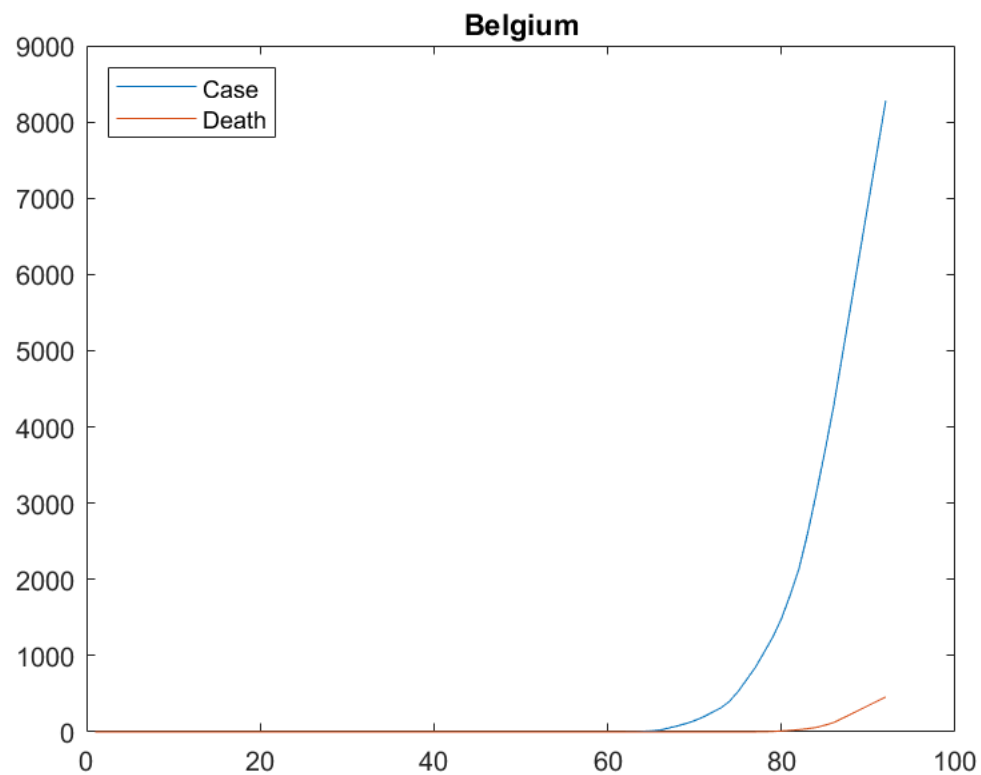
```matlab
legend('Case','Death',"Location","northwest");
title('Belgium');
hold off;
```
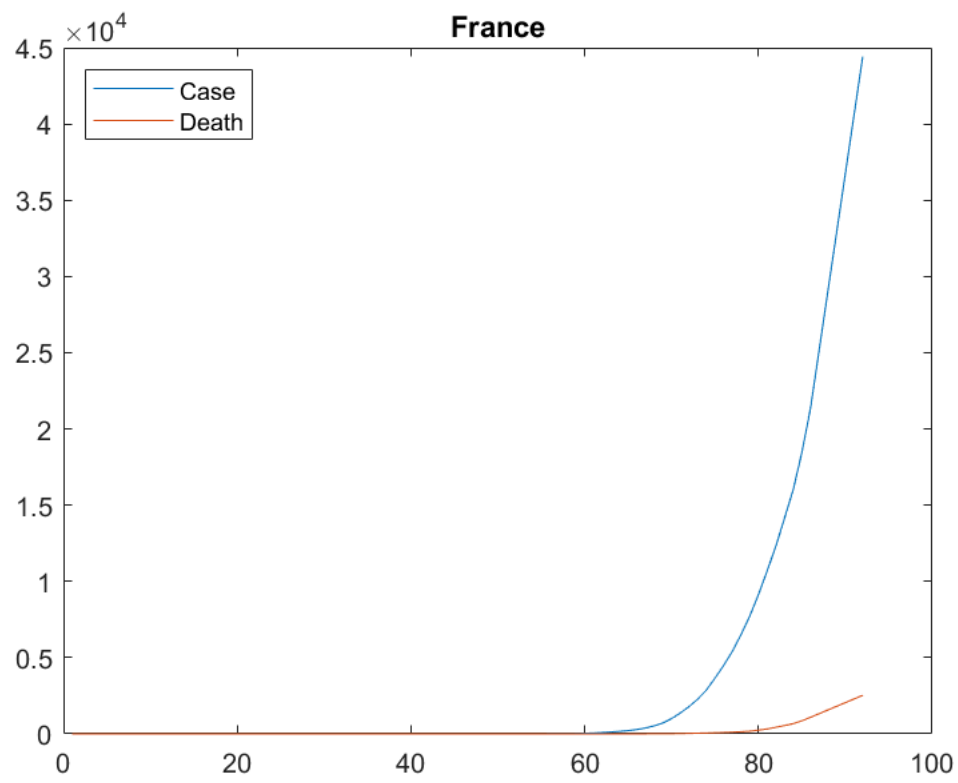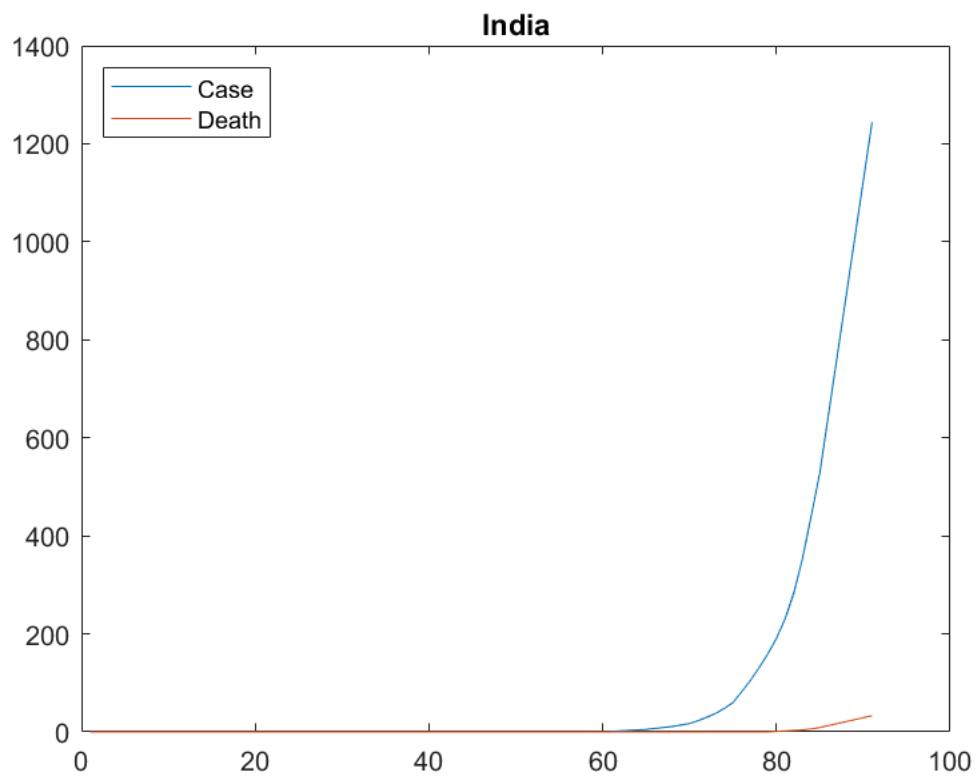

Belgium

```matlab
plot(ProcessedFranceCase);
hold on;
plot(ProcessedFranceDeath);
legend('Case','Death',"Location","northwest");
title('France');
hold off;
```
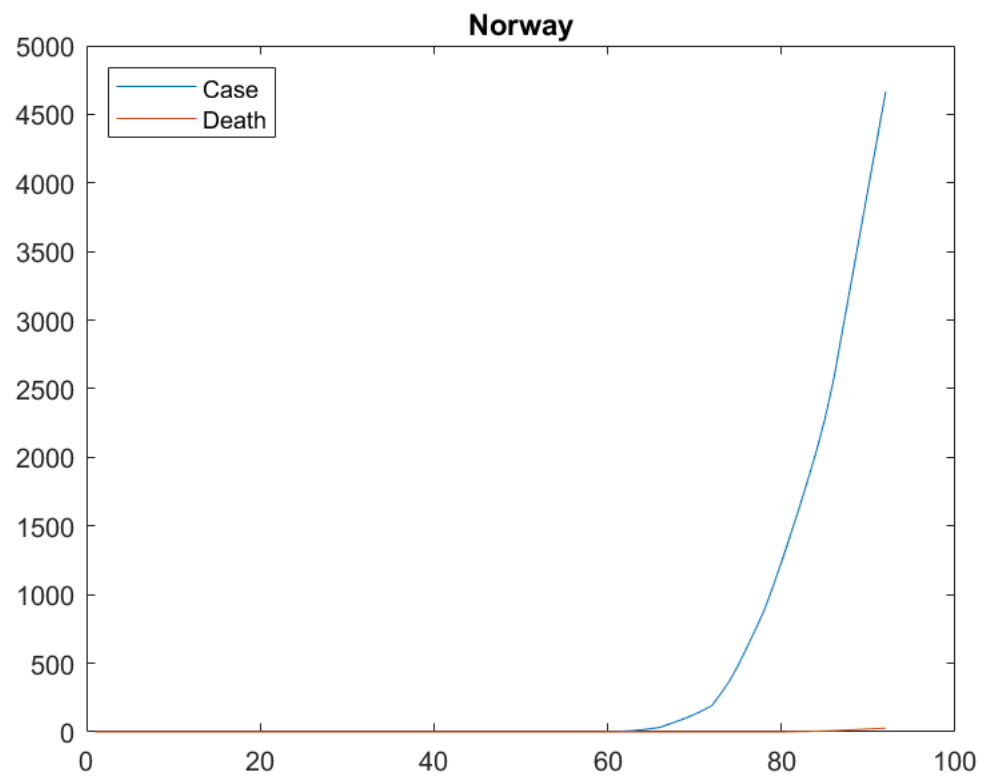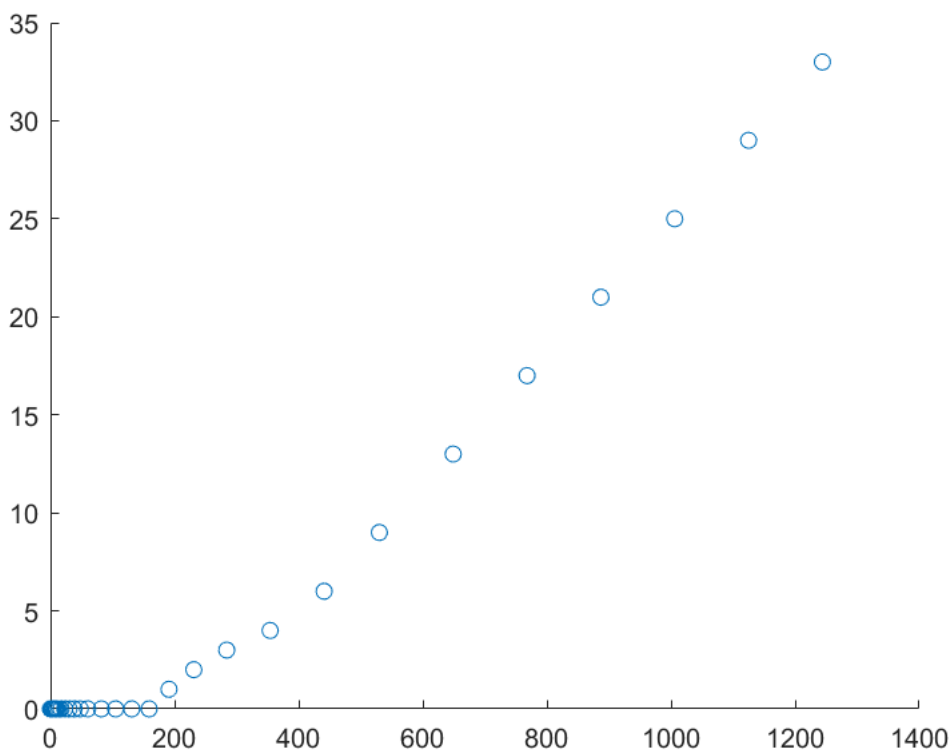
```
plot(ProcessedIndiaCase);
hold on;
plot(ProcessedIndiaDeath);
legend('Case','Death',"Location","northwest");
title('India');
hold off;
```

India

```
plot(ProcessedNorwayCase);
hold on;
plot(ProcessedNorwayDeath);
legend('Case','Death',"Location","northwest");
title('Norway');
hold off;
```

Norway

```
scatter(ProcessedIndiaCase,ProcessedIndiaDeath)
```

---

covIndia=cov(ProcessedIndiaCase',ProcessedIndiaDeath')

```
covIndia = 2×2
10^4 ×
    6.3085    0.1490
    0.1490    0.0037
```

---

corIndia=corr(ProcessedIndiaCase',ProcessedIndiaDeath')

```
corIndia = 0.9786
```

---

tableCovIndia=array2table(covIndia)

tableCovIndia = 2×2 table

	covIndia1	covIndia2
1	6.3085e+04	1.4904e+03
2	1.4904e+03	36.7670

---

scatter(ProcessedBelgiumCase,ProcessedBelgiumDeath)
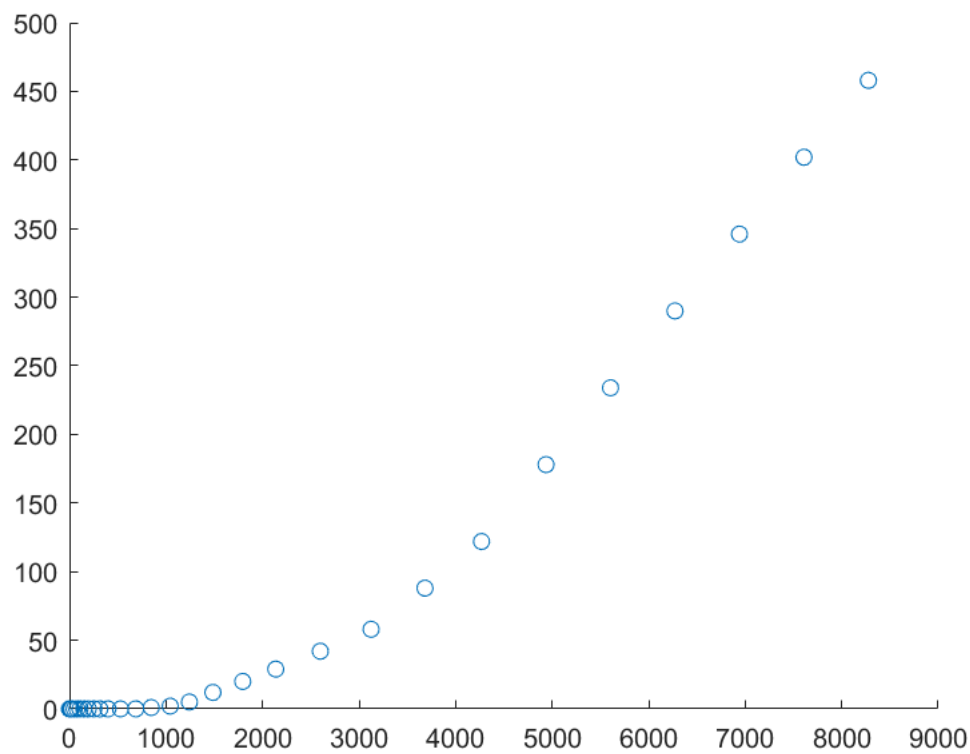
```
covBelgium=cov(ProcessedBelgiumCase',ProcessedBelgiumDeath')
```

```
covBelgium = 2×2
10^6  ×
    3.1546    0.1419
    0.1419    0.0070
```

```
corrBelgium=corr(ProcessedBelgiumCase',ProcessedBelgiumDeath')
```

```
corrBelgium = 0.9572
```

```
tableCovBelgium=array2table(covBelgium)
```

tableCovBelgium = 2×2 table

	covBelgium1	covBelgium2
1	3.1546e+06	1.4190e+05
2	1.4190e+05	6.9664e+03

```
scatter(ProcessedFranceCase,ProcessedFranceDeath)
```
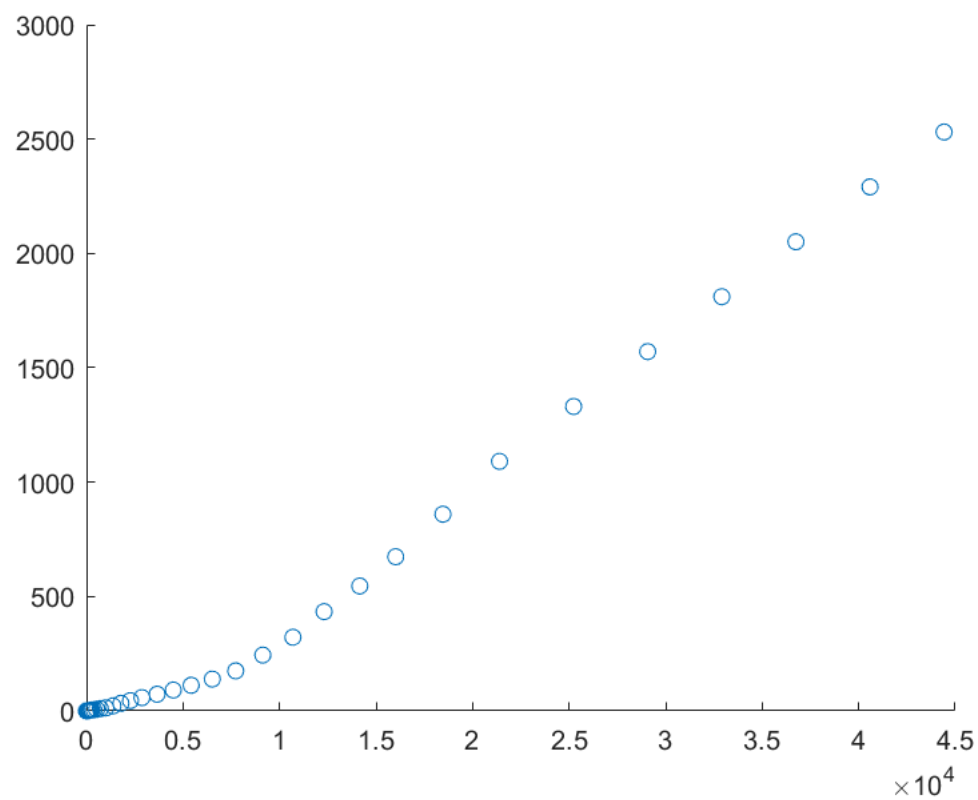
```
covFrance=cov(ProcessedFranceCase',ProcessedFranceDeath')
```

```
covFrance = 2×2
10⁷ ×
    8.7780    0.4716
    0.4716    0.0258
```

```
corrFrance=corr(ProcessedFranceCase',ProcessedFranceDeath')
```

```
corrFrance = 0.9902
```

```
tableCovFrance=array2table(covFrance)
```

tableCovFrance = 2×2 table

	covFrance1	covFrance2
1	8.7780e+07	4.7165e+06
2	4.7165e+06	2.5847e+05

```
scatter(ProcessedNorwayCase,ProcessedNorwayDeath)
```
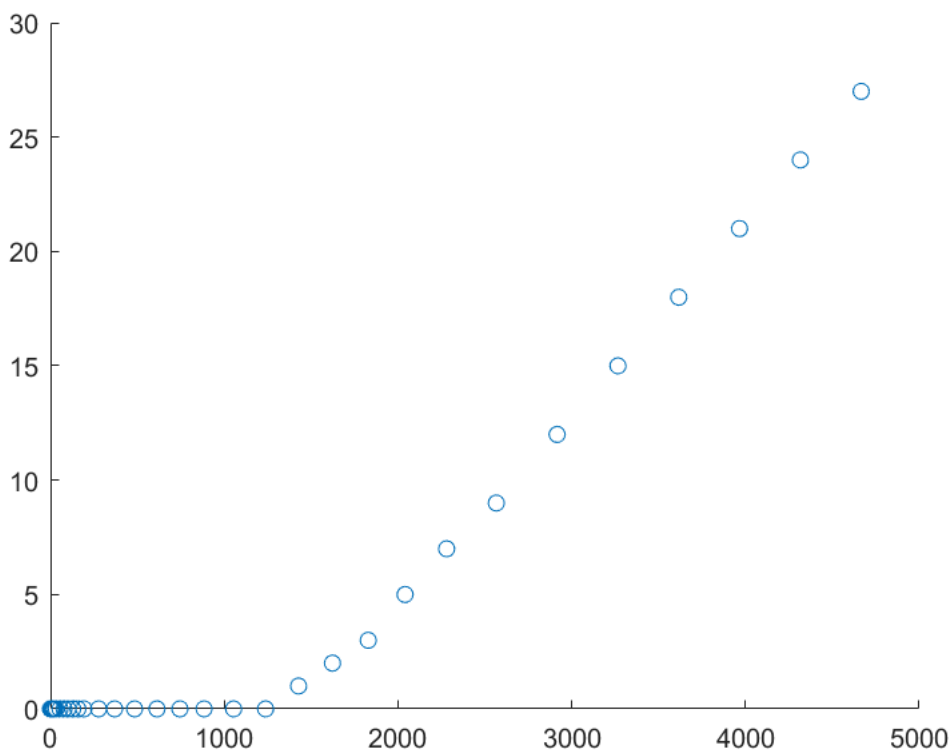
```
covNorway=cov(ProcessedNorwayCase',ProcessedNorwayDeath')
```

covNorway = 2×2
10^6 ×
      1.0878   0.0050
      0.0050   0.0000

```
corrNorway=corr(ProcessedNorwayCase',ProcessedNorwayDeath')
```

corrNorway = 0.9414

```
tableCovNorway=array2table(covNorway)
```

tableCovNorway = 2×2 table

	covNorway1	covNorway2
1	1.0878e+06	5.0241e+03
2	5.0241e+03	26.1825

```
figure('Name','Refined data','NumberTitle','off');
corrplot([ProcessedIndiaCase' ProcessedIndiaDeath'],'varNames',{('Death'),('Case')})
```

Correlation Matrix
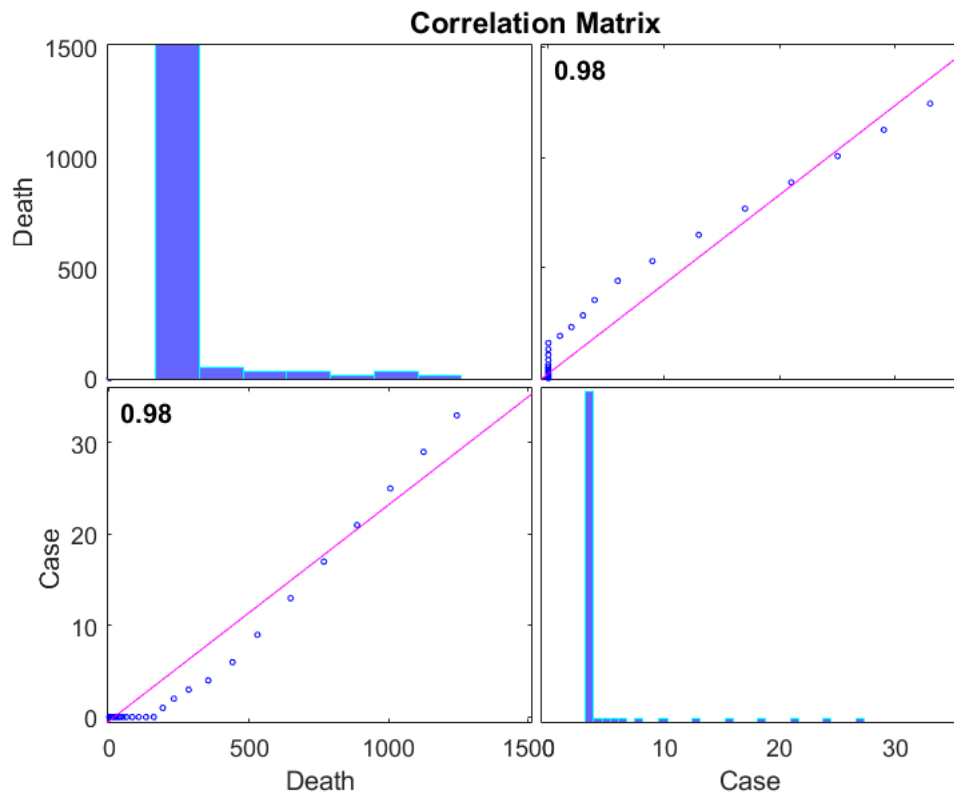
```
import mlreportgen.report.*
import mlreportgen.dom.*
R=Report('Analyze Covid Virus Data_20180808045','pdf')
```

```
R =
  Report with properties:

      OutputPath: 'Analyze Covid Virus Data_20180808045'
            Type: 'pdf'
    TemplatePath: []
          Locale: []
           Debug: 0
          Layout: [1×1 mlreportgen.report.ReportLayout]
        Document: [0×0 mlreportgen.dom.Document]
         Context: [0×1 containers.Map]
```

```
R.Layout.Landscape = true;
open(R)
tp = TitlePage;
tp.Title = 'Analyze Covid Virus Data for Some Countries';
tp.Author = '  Arda Atasoy        ';
add(R,tp);

p1 = Paragraph([ ...
'This study relate to some coutries struggles aboub covid-19.' ...
'Process India,Belgium,France,Norway ']);
add(R,p1)
```

```
ch2 = Chapter();
ch2.Title = sprintf('covariation relaitionships for India');

Figure
```

```
ans =
  Figure with properties:

              SnapshotFormat: "svg"
                      Source: []
                    Snapshot: [1×1 mlreportgen.report.FormalImage]
                     Scaling: "auto"
                      Height: "6in"
                       Width: "6.5in"
      PreserveBackgroundColor: 0
                 TemplateSrc: []
                TemplateName: "Figure"
                  LinkTarget: []
```

```
plot(ProcessedIndiaCase);
hold on;
plot(ProcessedIndiaDeath);
legend('Case','Death',"Location","northwest");
title('India');
hold off;
add(R,Figure);
```
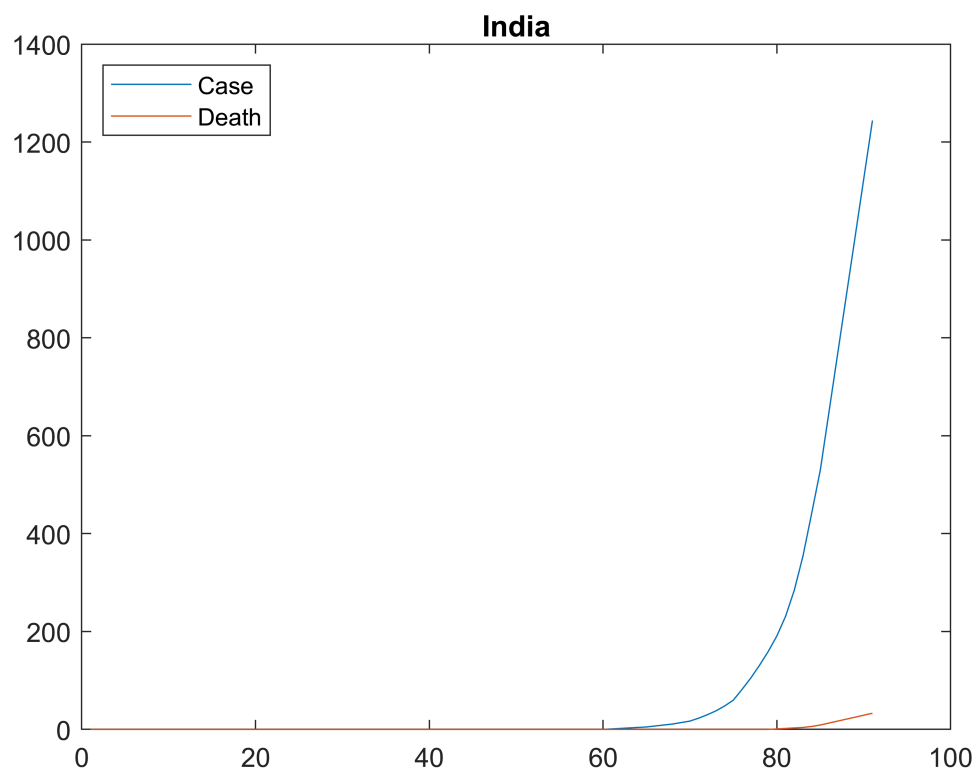


```
T=Text("                         ")
```

```
T =
  Text with properties:

              Content: '                    '
                 Bold: []
               Italic: []
                Color: []
      BackgroundColor: []
            Underline: []
           WhiteSpace: []
       FontFamilyName: []
             FontSize: []
               Strike: []
            StyleName: []
                Style: {1×0 cell}
     CustomAttributes: []
               Parent: []
             Children: [1×0 mlreportgen.dom.Node]
                  Tag: 'dom.Text:99154'
                   Id: '99154'
```

```
tableCov=array2table(covIndia)
```

tableCov = 2×2 table

	covIndia1	covIndia2
1	6.3085e+04	1.4904e+03
2	1.4904e+03	36.7670

```matlab
tbl = Table(tableCovIndia);

tbl.Style = {...
    RowSep('solid','black','1px'),...
    ColSep('solid','black','1px'),};
tbl.Border = 'double';
tbl.TableEntriesStyle = {HAlign('center')};

add(ch2,tbl);
add(R,ch2);

p2 = Paragraph([ ...
'The case in India is more to see the increase' ...
' rate of increase, the number of deaths increase.']);
add(R,p2)


ch3 = Chapter();
ch3.Title = sprintf('covariation relaitionships for Norway');

Figure
```

```
ans =
  Figure with properties:

          SnapshotFormat: "svg"
                  Source: []
                Snapshot: [1×1 mlreportgen.report.FormalImage]
```

```
              Scaling: "auto"
               Height: "6in"
                Width: "6.5in"
PreserveBackgroundColor: 0
          TemplateSrc: []
         TemplateName: "Figure"
           LinkTarget: []
```

```matlab
plot(ProcessedNorwayCase);
hold on;
plot(ProcessedNorwayDeath);
legend('Case','Death',"Location","northwest");
title('Norway');
hold off;
add(R,Figure);
```



```matlab
T=Text("                     ")
```

```
T =
  Text with properties:

            Content: '                   '
               Bold: []
             Italic: []
              Color: []
    BackgroundColor: []
          Underline: []
         WhiteSpace: []
     FontFamilyName: []
           FontSize: []
```

```
        Strike: []
     StyleName: []
         Style: {1×0 cell}
CustomAttributes: []
        Parent: []
      Children: [1×0 mlreportgen.dom.Node]
           Tag: 'dom.Text:99688'
            Id: '99688'
```

```
tableCov=array2table(covNorway)
```

tableCov = 2×2 table

	covNorway1	covNorway2
1	1.0878e+06	5.0241e+03
2	5.0241e+03	26.1825

```
tbl = Table(tableCovNorway);

tbl.Style = {...
    RowSep('solid','black','1px'),...
    ColSep('solid','black','1px'),};
tbl.Border = 'double';
tbl.TableEntriesStyle = {HAlign('center')};

add(ch3,tbl);
add(R,ch3);

para = Paragraph([ ...
'Among the countries we have studied, Norway is the country that best tackles this ' ...
'problem. The death rate is very low compared to the number of cases.']);

ch4 = Chapter();
ch4.Title = sprintf('covariation relaitionships for France');

Figure
```

```
ans =
  Figure with properties:

          SnapshotFormat: "svg"
                  Source: []
                Snapshot: [1×1 mlreportgen.report.FormalImage]
                 Scaling: "auto"
                  Height: "6in"
                   Width: "6.5in"
   PreserveBackgroundColor: 0
             TemplateSrc: []
            TemplateName: "Figure"
              LinkTarget: []
```
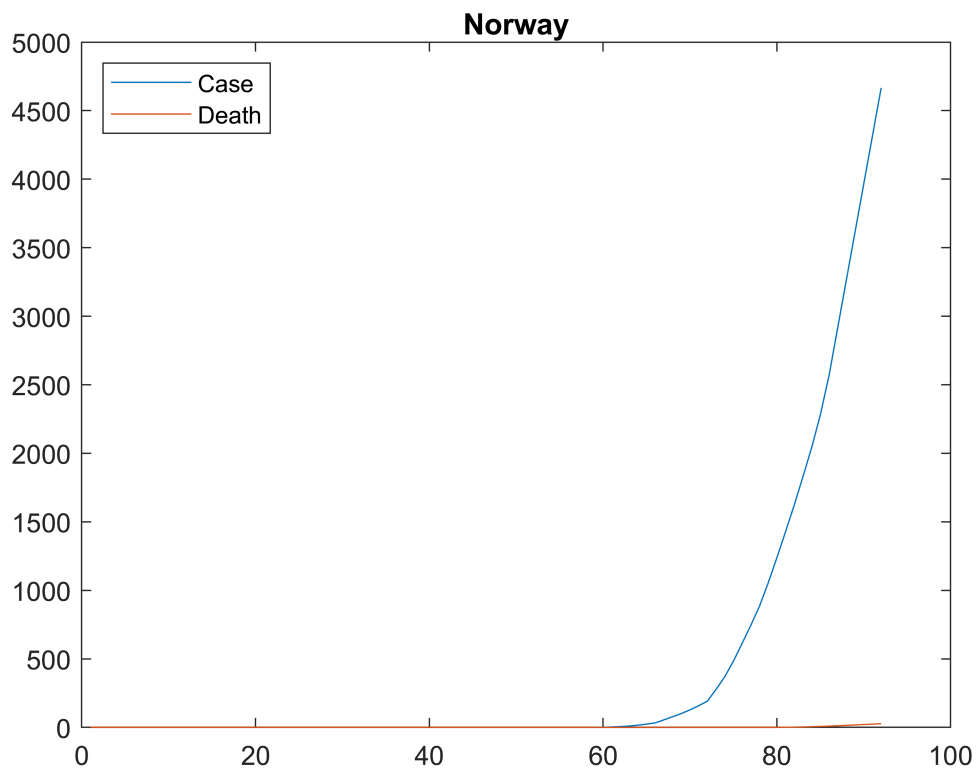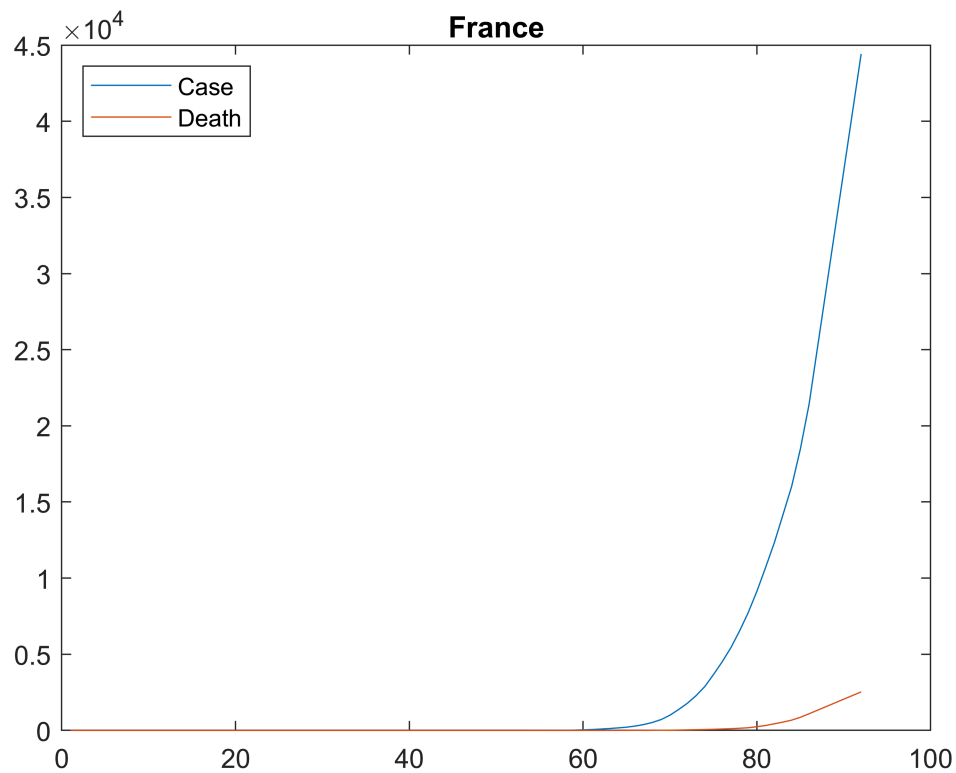
```
plot(ProcessedFranceCase)
hold on
plot(ProcessedFranceDeath)
legend('Case','Death',"Location","northwest")
title('France')
hold off
```

```
add(R,Figure)
```



```
ch2 = Chapter();
ch2.Title = sprintf('covariation relaitionships');
T=Text("                    ")
```

```
T =
  Text with properties:

              Content: '                    '
                 Bold: []
               Italic: []
                Color: []
      BackgroundColor: []
            Underline: []
           WhiteSpace: []
       FontFamilyName: []
             FontSize: []
               Strike: []
            StyleName: []
                Style: {1×0 cell}
     CustomAttributes: []
               Parent: []
             Children: [1×0 mlreportgen.dom.Node]
                  Tag: 'dom.Text:99887'
                   Id: '99887'
```

```
tableCov=array2table(covFrance)
```

```
tableCov = 2×2 table
```

	covFrance1	covFrance2
1	8.7780e+07	4.7165e+06
2	4.7165e+06	2.5847e+05

```matlab
tbl = Table(tableCovFrance);

tbl.Style = {...
    RowSep('solid','black','1px'),...
    ColSep('solid','black','1px'),};
tbl.Border = 'double';
tbl.TableEntriesStyle = {HAlign('center')};

add(ch2,tbl);
add(R,ch2);




add(R,Chapter('Title','Tests'));
add(R,Chapter('Title','Unit Tests'));
add(R,T)




Figure
```
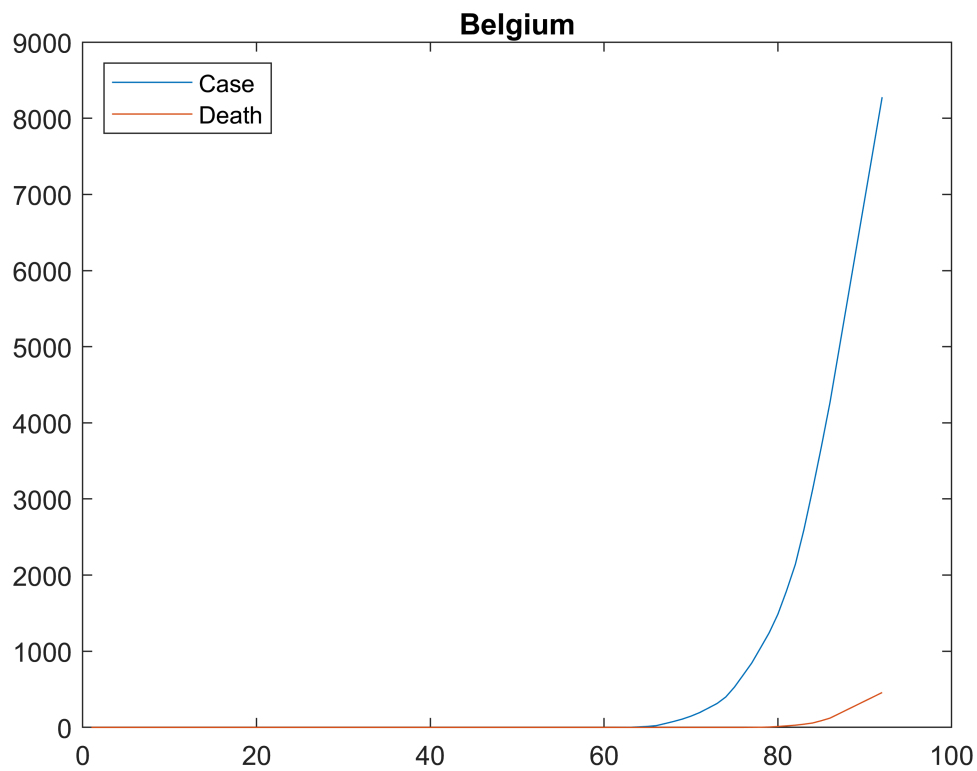
```
ans =
  Figure with properties:

        SnapshotFormat: "svg"
                Source: []
              Snapshot: [1×1 mlreportgen.report.FormalImage]
               Scaling: "auto"
                Height: "6in"
                 Width: "6.5in"
    PreserveBackgroundColor: 0
           TemplateSrc: []
          TemplateName: "Figure"
            LinkTarget: []
```

```matlab
plot(ProcessedBelgiumCase)
hold on
plot(ProcessedBelgiumDeath)
legend('Case','Death',"Location","northwest")
title('Belgium')
hold off
add(R,Figure)
```

Belgium

```
ch2 = Chapter();
ch2.Title = sprintf('Covariation Relaitionships for Belgium');
T=Text("                    ")
```

```
T =
  Text with properties:

              Content: '                    '
                 Bold: []
               Italic: []
                Color: []
      BackgroundColor: []
            Underline: []
           WhiteSpace: []
        FontFamilyName: []
             FontSize: []
               Strike: []
            StyleName: []
                Style: {1×0 cell}
      CustomAttributes: []
               Parent: []
             Children: [1×0 mlreportgen.dom.Node]
                  Tag: 'dom.Text:100295'
                   Id: '100295'
```

```
tableCov=array2table(covBelgium)
```

```
tableCov = 2×2 table
```

	covBelgium1	covBelgium2
1	3.1546e+06	1.4190e+05
2	1.4190e+05	6.9664e+03

```matlab
tbl = Table(tableCovBelgium);

tbl.Style = {...
    RowSep('solid','black','1px'),...
    ColSep('solid','black','1px'),};
tbl.Border = 'double';
tbl.TableEntriesStyle = {HAlign('center')};

add(ch2,tbl);
add(R,ch2);



Figure
```
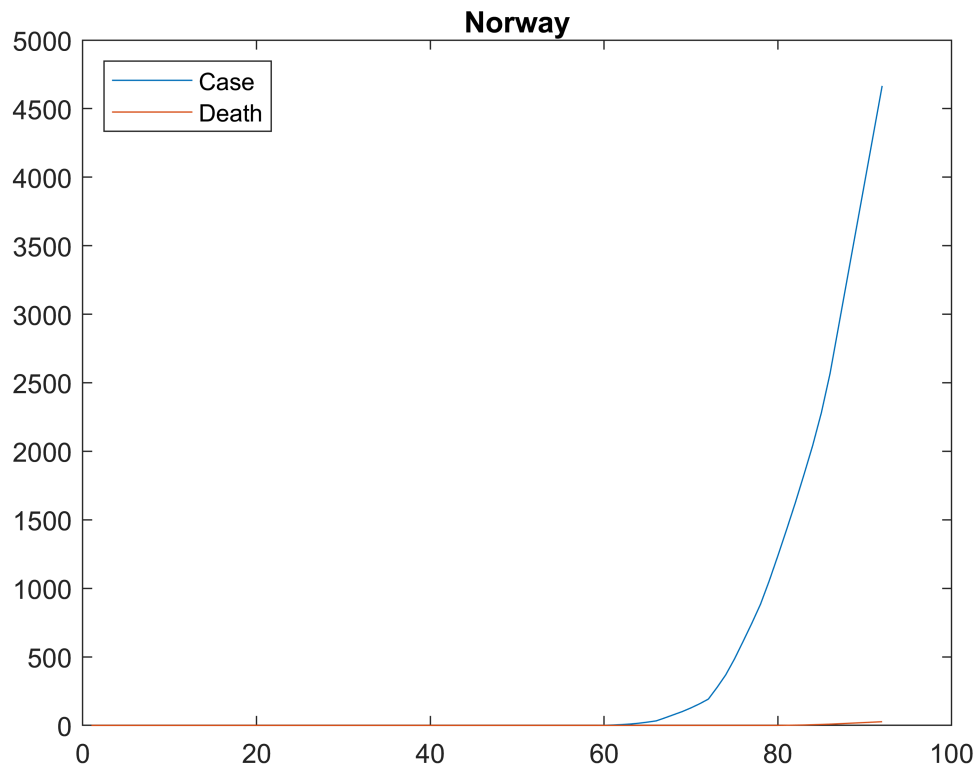
```
ans =
  Figure with properties:

            SnapshotFormat: "svg"
                    Source: []
                  Snapshot: [1×1 mlreportgen.report.FormalImage]
                   Scaling: "auto"
                    Height: "6in"
                     Width: "6.5in"
    PreserveBackgroundColor: 0
               TemplateSrc: []
              TemplateName: "Figure"
                 LinkTarget: []
```

```matlab
plot(ProcessedNorwayCase)
hold on
plot(ProcessedNorwayDeath)
legend('Case','Death',"Location","northwest")
title('Norway')
hold off
add(R,Figure)
```

Norway

```
ch2 = Chapter();
ch2.Title = sprintf('Covariation Relaitionships for Norway');
T=Text("                    ")
```

```
T =
  Text with properties:

            Content: '                  '
               Bold: []
             Italic: []
              Color: []
    BackgroundColor: []
          Underline: []
         WhiteSpace: []
     FontFamilyName: []
           FontSize: []
             Strike: []
          StyleName: []
              Style: {1×0 cell}
   CustomAttributes: []
             Parent: []
           Children: [1×0 mlreportgen.dom.Node]
                Tag: 'dom.Text:100494'
                 Id: '100494'
```

```
tableCov=array2table(covNorway)
```

```
tableCov = 2×2 table
```

	covNorway1	covNorway2
1	1.0878e+06	5.0241e+03
2	5.0241e+03	26.1825

```matlab
tbl = Table(tableCovNorway);

tbl.Style = {...
    RowSep('solid','black','1px'),...
    ColSep('solid','black','1px'),};
tbl.Border = 'double';
tbl.TableEntriesStyle = {HAlign('center')};

add(ch2,tbl);
add(R,ch2);



Figure
```
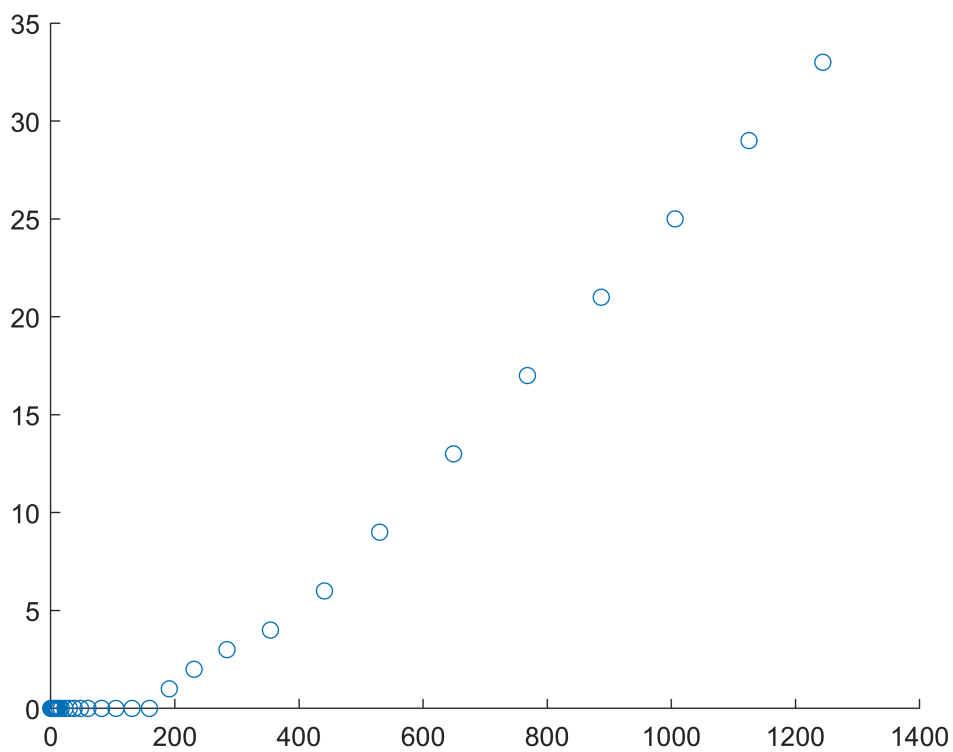
```
ans =
  Figure with properties:

           SnapshotFormat: "svg"
                   Source: []
                 Snapshot: [1×1 mlreportgen.report.FormalImage]
                  Scaling: "auto"
                   Height: "6in"
                    Width: "6.5in"
    PreserveBackgroundColor: 0
              TemplateSrc: []
             TemplateName: "Figure"
               LinkTarget: []
```

```matlab
scatter(ProcessedIndiaCase,ProcessedIndiaDeath)
add(R,Figure);
```

Figure

```
ans =
  Figure with properties:

             SnapshotFormat: "svg"
                     Source: []
                   Snapshot: [1×1 mlreportgen.report.FormalImage]
                    Scaling: "auto"
                     Height: "6in"
                      Width: "6.5in"
    PreserveBackgroundColor: 0
                TemplateSrc: []
               TemplateName: "Figure"
                 LinkTarget: []
```
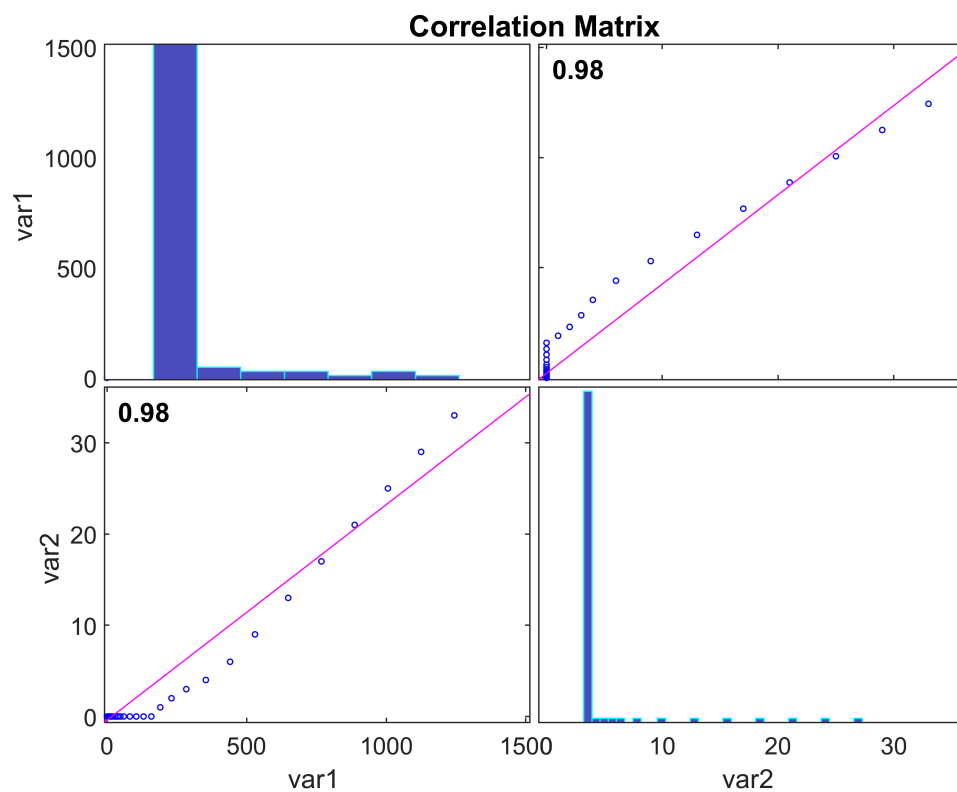
```
corrplot([ProcessedIndiaCase' ProcessedIndiaDeath']);
add(R,Figure);
```
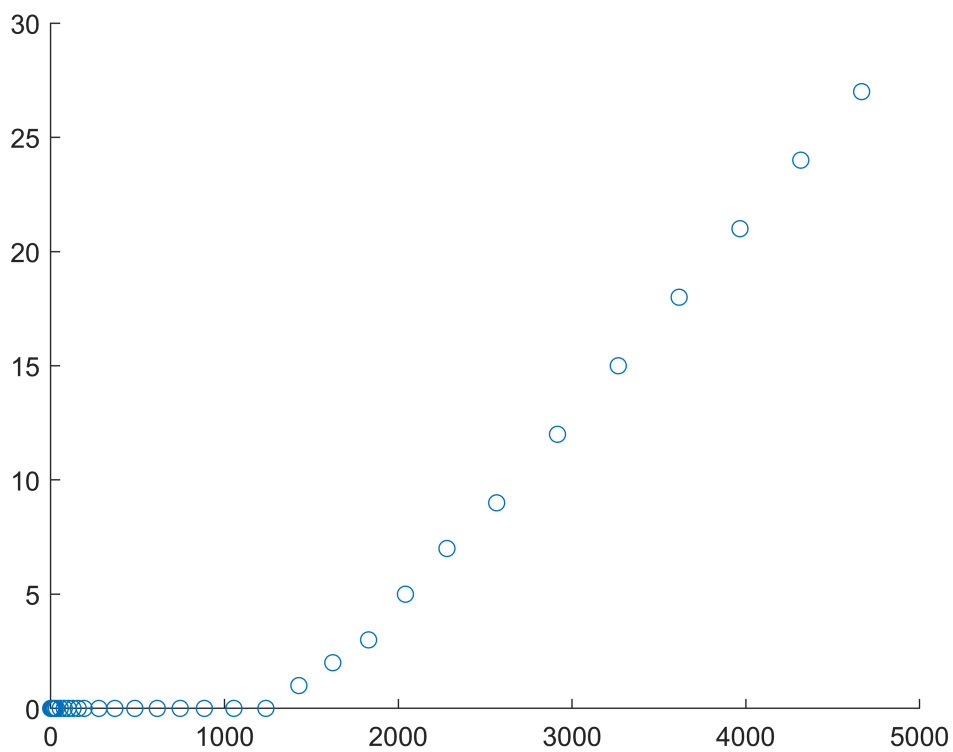
Correlation Matrix

```
Figure
```

```
ans =
  Figure with properties:

            SnapshotFormat: "svg"
                    Source: []
                  Snapshot: [1×1 mlreportgen.report.FormalImage]
                   Scaling: "auto"
                    Height: "6in"
                     Width: "6.5in"
    PreserveBackgroundColor: 0
               TemplateSrc: []
              TemplateName: "Figure"
                LinkTarget: []
```
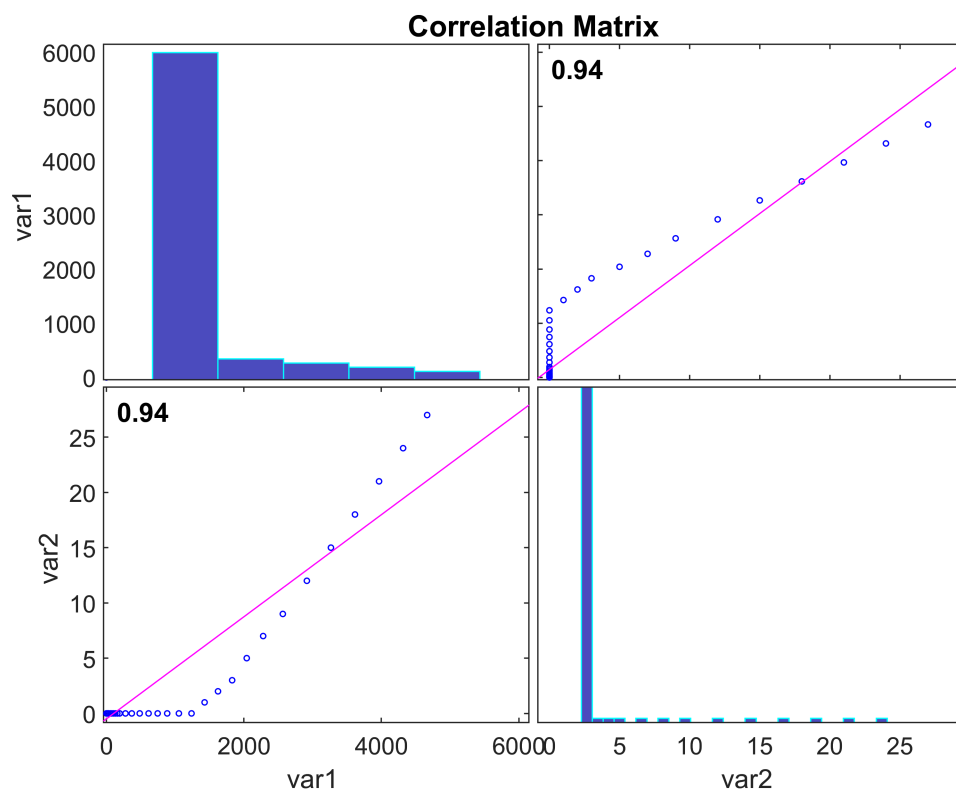
```
scatter(ProcessedNorwayCase,ProcessedNorwayDeath)
add(R,Figure);
```

Figure

```
ans =
  Figure with properties:

             SnapshotFormat: "svg"
                     Source: []
                   Snapshot: [1×1 mlreportgen.report.FormalImage]
                    Scaling: "auto"
                     Height: "6in"
                      Width: "6.5in"
    PreserveBackgroundColor: 0
                TemplateSrc: []
               TemplateName: "Figure"
                 LinkTarget: []
```

```
corrplot([ProcessedNorwayCase' ProcessedNorwayDeath']);
add(R,Figure);
```
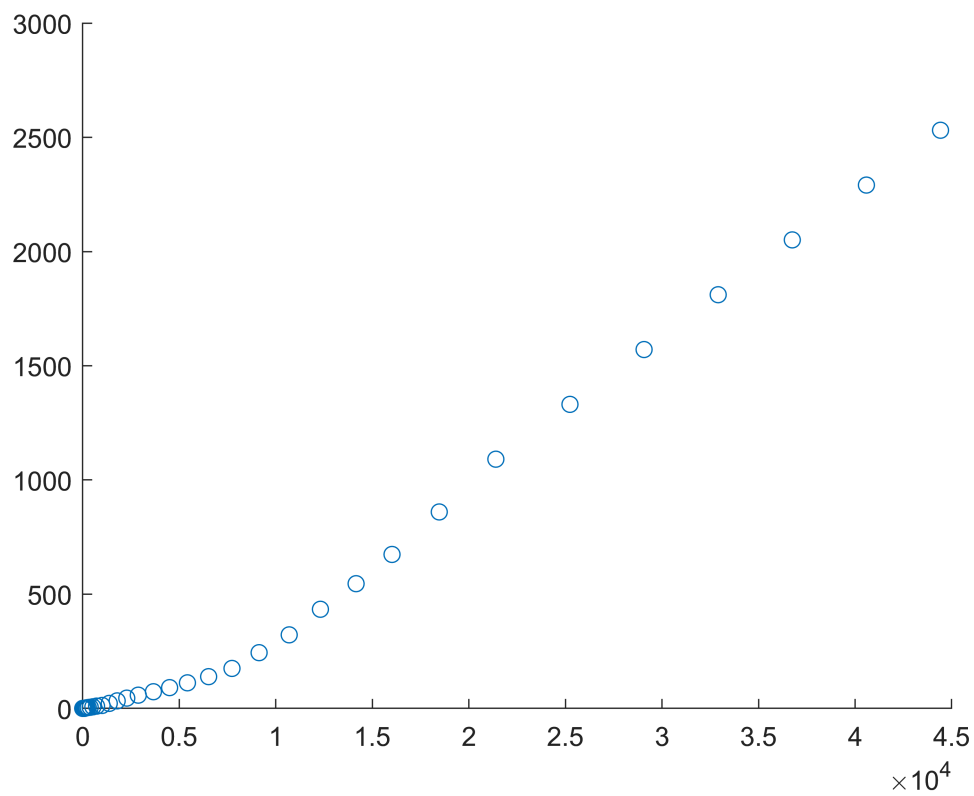
Correlation Matrix


```
Figure
```

```
ans =
  Figure with properties:

            SnapshotFormat: "svg"
                    Source: []
                  Snapshot: [1×1 mlreportgen.report.FormalImage]
                   Scaling: "auto"
                    Height: "6in"
                     Width: "6.5in"
    PreserveBackgroundColor: 0
               TemplateSrc: []
              TemplateName: "Figure"
                 LinkTarget: []
```

```
scatter(ProcessedFranceCase,ProcessedFranceDeath)
add(R,Figure);
```

```
ans =
  Figure with properties:

             SnapshotFormat: "svg"
                     Source: []
                   Snapshot: [1×1 mlreportgen.report.FormalImage]
                    Scaling: "auto"
                     Height: "6in"
                      Width: "6.5in"
     PreserveBackgroundColor: 0
                TemplateSrc: []
               TemplateName: "Figure"
                 LinkTarget: []
```
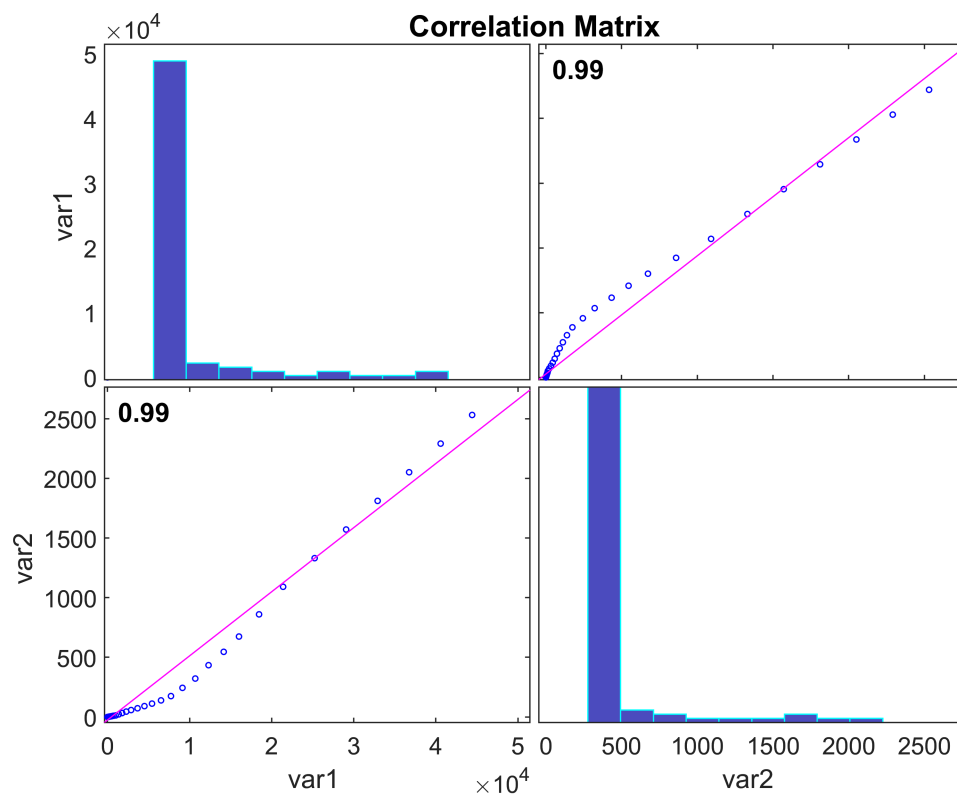
```
corrplot([ProcessedFranceCase' ProcessedFranceDeath']);
add(R,Figure);
```

Correlation Matrix

Figure

```
ans =
  Figure with properties:

            SnapshotFormat: "svg"
                    Source: []
                  Snapshot: [1×1 mlreportgen.report.FormalImage]
                   Scaling: "auto"
                    Height: "6in"
                     Width: "6.5in"
    PreserveBackgroundColor: 0
               TemplateSrc: []
              TemplateName: "Figure"
                LinkTarget: []
```

```
scatter(ProcessedBelgiumCase,ProcessedBelgiumDeath)
add(R,Figure);
```

Figure

```
ans =
  Figure with properties:

            SnapshotFormat: "svg"
```
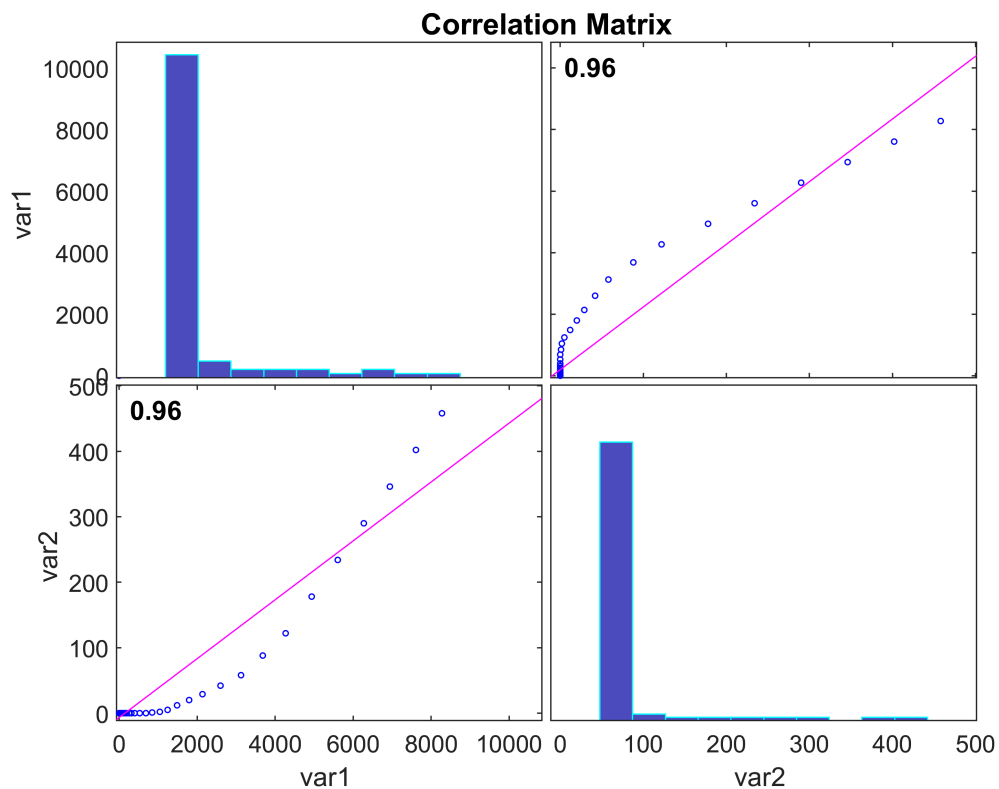
```
          Source: []
        Snapshot: [1×1 mlreportgen.report.FormalImage]
         Scaling: "auto"
          Height: "6in"
           Width: "6.5in"
PreserveBackgroundColor: 0
     TemplateSrc: []
    TemplateName: "Figure"
      LinkTarget: []
```

```
corrplot([ProcessedBelgiumCase' ProcessedBelgiumDeath']);
add(R,Figure);
```



```
p10 = Paragraph([ ...
'Differrent countries growth rates are '...
'Italy cases grew by 5,322 equalling a growth of 15%' ...
'Spain cases grew by 4,053 equalling a growth of 29%' ...
'Germany cases grew by 2,993 equalling a growth of 24%' ...
'France cases grew by 1,828 equalling a growth of 20%'...
'Switzerland cases grew by 1,047 equalling a growth of 35%'...
'Iran cases grew by 1,046 equalling a growth of 6%'...
'Netherlands cases grew by 409 equalling a growth of 20%'...
```

```
'Austria cases grew by 367 equalling a growth of 22%'...
'Portugal cases grew by 337 equalling a growth of 75%'...
'Belgium cases grew by 309 equalling a growth of 21%'...
'Ireland cases grew by 265 equalling a growth of 91%'...
'Brazil cases grew by 249 equalling a growth of 67%'...
'Israel cases grew by 244 equalling a growth of 56%'...
'Czechia cases grew by 230 equalling a growth of 50%'...
'Norway cases grew by 196 equalling a growth of 13%'...
'Sweden cases grew by 160 equalling a growth of 13%'...
'Pakistan cases grew by 155 equalling a growth of 52%'...
'South Korea cases grew by 152 equalling a growth of 2%'...
'Canada cases grew by 143 equalling a growth of 22%'...
'Luxembourg cases grew by 132 equalling a growth of 65%'...
'Australia cases grew by 113 equalling a growth of 20%'...
'Malaysia cases grew by 110 equalling a growth of 14%'...
'Poland cases grew by 104 equalling a growth of 41%'...
'Saudi Arabia cases grew by 103 equalling a growth of 60%'...
'Turkey cases grew by 94 equalling a growth of 96%'...
'Denmark cases grew by 94 equalling a growth of 9%'...
'Peru cases grew by 89 equalling a growth of 61%'...
'Ecuador cases grew by 88 equalling a growth of 79%'...
'Indonesia cases grew by 84 equalling a growth of 37%'...
'Iceland cases grew by 80 equalling a growth of 32%'...
'Finland cases grew by 64 equalling a growth of 19%'...
'United Kingdom cases grew by 63 equalling a growth of 2%'...
'Egypt cases grew by 60 equalling a growth of 31%'...
'Thailand cases grew by 60 equalling a growth of 28%'...
'China cases grew by 54 equalling a growth of 0%'...
'Russia cases grew by 52 equalling a growth of 35%'...
'India cases grew by 38 equalling a growth of 24%'...
'Japan cases grew by 35 equalling a growth of 4%'...
'South Africa cases grew by 34 equalling a growth of 29%'...
'Singapore cases grew by 32 equalling a growth of 10%'...
'Armenia cases grew by 31 equalling a growth of 37%'...
'Iraq cases grew by 28 equalling a growth of 17%'...
'United Arab Emirates cases grew by 27 equalling a growth of 24%'...
'Mexico cases grew by 25 equalling a growth of 27%'...
'Croatia cases grew by 24 equalling a growth of 30%'...
'Lebanon cases grew by 24 equalling a growth of 18%'...
'Panama cases grew by 23 equalling a growth of 27%'...
'Bahrain cases grew by 22 equalling a growth of 9%'...
'Serbia cases grew by 20 equalling a growth of 24%']);
add(R,p10)
add(R,TableOfContents);
close(R);
rptview(R);
```