1) MAINFILE.m

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descriptive.m | fit_curve1.m | MAINFILE.m | predict.m | visualize.m

```
1   data=readtable("owid-covid-data.csv");
2   disp('Data loaded sucessfully.')
3   data_1=data(1:2500,:);
4   choice=0;
5   while choice ~=5
6   disp('---COVID-19 DATA---');
7   disp('1.View Descriptive Statistics');
8   disp('2.Predict Data');
9   disp('3.Visualize Data');
10  disp('4.Fit a curve');
11  disp('5.Exit');
12  choice=input('Enter your selection: ');
13  if choice==1
14     descriptive(data)
15  elseif choice==2
16      predict(data);
17  elseif choice==3
18          visualize(data);
19  elseif choice==4
20      fit_curve1(data)
21  elseif choice==5
22      disp('Exiting');
23  else
24      disp('Invalid input. Try Again.')
25  end
26  end
```

2) Discriptive.m

descriptive.m | fit_curve1.m | MAINFILE.m | predict.m | visualize.m

```
function descriptive(data)
cases=data.new_cases(1:min(length(data.new_cases),2500));
total=0;
max_cases=-Inf;
min_cases=Inf;
val_count=0;
for i= 1:length(cases)
    if ~isnan(cases(i)) && cases(i) ~=0
    total=total+cases(i);
    val_count= val_count+1;
    if cases(i)>max_cases
        max_cases=cases(i);
    end
    if cases(i)<min_cases
        min_cases=cases(i);
    end
    end
end
if val_count>0
meancases=total./val_count;
else
    meancases = NaN ;
end
if val_count > 0
    range_cases = max_cases- min_cases;
else
```

```
    meancases = NaN ;
end
if val_count > 0
    range_cases = max_cases- min_cases;
else
    range_cases = NaN
end
disp('---Descriptive Statistics---')
fprintf('Total New Cases: %0.2f\n',total)
fprintf('Mean New Cases: %0.2f\n', meancases)
fprintf('Max New Cases: %0.2f\n', max_cases)
fprintf('Min New Cases: %0.2f\n', min_cases)
fprintf('Range of New Cases: %0.2f\n', range_cases);
end
```

3) Predict.m

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descriptive.m | fit_curve1.m | MAINFILE.m | predict.m | visualize.m

```
function predict(data)
cases=data.new_cases(1:2500);
deaths=data.new_deaths(1:2500);
totalcase=0;
totaldeath=0;
validdays=0;
day=1;
while day <=2500
    if ~isnan(cases(day))&& ~isnan(deaths(day))
        totalcase=totalcase+cases(day);
        totaldeath=totaldeath+deaths(day);
        validdays=validdays+1;
    end
    day=day+1;
  if validdays >0
      avg_cases=totalcase/validdays;
      avg_deaths=totaldeath/validdays;
  else
         avg_cases=NaN;
      avg_deaths=NaN;
  end
end
disp('---Trend Prediction---')
fprintf('Average New Cases (Overall): %0.2f\n', avg_cases)
fprintf('Predicted New Cases (Next Day): %0.2f\n', avg_cases)
fprintf('Average New Deaths (Overall): %0.2f\n', avg_deaths)
```

```
disp('---Trend Prediction---')
fprintf('Average New Cases (Overall): %0.2f\n', avg_cases)
fprintf('Predicted New Cases (Next Day): %0.2f\n', avg_cases)
fprintf('Average New Deaths (Overall): %0.2f\n', avg_deaths)
fprintf('Average New Deaths (Next Day): %0.2f\n', avg_deaths)
```

4) Visualize.m

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descriptive.m | fit_curve1.m | MAINFILE.m | predict.m | visualize.m

```
function visualize(data)
cases=data.new_cases(1:2500);
deaths=data.new_deaths(1:2500);
days=1:2500;
%2D
figure;
plot(days,cases,'r-','LineWidth',1.5);
title('New COVID-19 Cases Over Time')
xlabel('Days')
ylabel('New Cases');
grid on
%bar
figure;
bar(days,deaths,'Facecolor','r')
title('New COVID-19 Deaths Over Time')
xlabel('Days');
ylabel('New Deaths');
grid on;
%3D
figure;
scatter3(cases,deaths,days,'filled');
title('3D Scattar Plot: Cases vs Deaths');
xlabel('New Cases');
ylabel('New Deaths');
zlabel('Days');
grid on;
```

```
ylabel('New Deaths');
zlabel('Days');
grid on;
end
```

5) Fit_curve.m

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descriptive.m | fit_curve1.m | MAINFILE.m | predict.m | visualize.m

```
function fit_curve1(data)
cases=data.new_cases (1:2500);
days=1:2500;
p=polyfit(days, cases,1);
yfit=polyval(p,days);
figure;
plot(days,cases,'b-','LineWidth',1.5);
hold on
plot(days,yfit,'r--','LineWidth',2);
title('COVID-19 Cases with Linear Fit');
xlabel('Days')
ylabel('New Cases');
legend('Actual Data', 'Linear Fit')
grid on
axis tight
ylim([min(cases)-10, max(cases)]);
end
```