

1) main.m

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Editor - C:\Users\ho9306\Downloads\MATLAB_Regression_Project_BE1500\MATLAB_Regression_Project
main.m x +
1 data=readtable("covid_dataset.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_stats(data)
15    elseif choice==2
16        predict_model(data);
17    elseif choice==3
18        visualize_results(data);
19    elseif choice==4
20        fit_regression_curve(data)
21    elseif choice==5
22        disp('Exiting');
23    else
24        disp('Invalid input. Try Again.')
25    end
26 end
```

2) descriptive_stats.m

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main.m x descriptive_stats.m x +
1 function descriptive_stats(data)
2 cases=data.new_cases(1:min(length(data.new_cases),2500));
3 total=0;
4 max_cases=-Inf;
5 min_cases=Inf;
6 val_count=0;
7 for i= 1:length(cases)
8     if ~isnan(cases(i)) && cases(i) ~=0
9         total=total+cases(i);
10        val_count= val_count+1;
11        if cases(i)>max_cases
12            max_cases=cases(i);
13        end
14        if cases(i)<min_cases
15            min_cases=cases(i);
16        end
17    end
18 end
19 if val_count>0
20     meancases=total./val_count;
21 else
22     meancases = NaN ;
23 end
24 if val_count > 0
25     range_cases = max_cases- min_cases;
26 else
27     range_cases = NaN
28 end
29 disp('---Descriptive Statistics---')
30 fprintf('Total New Cases: %0.2f\n',total)
31 fprintf('Mean New Cases: %0.2f\n', meancases)
32 fprintf('Max New Cases: %0.2f\n', max_cases)
33 fprintf('Min New Cases: %0.2f\n', min_cases)
34 fprintf('Range of New Cases: %0.2f\n', range_cases);
35 end
```

3) predict_model.m

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main.m x descriptive_stats.m x predict_model.m x +
1 function predict_model(data)
2     cases=data.new_cases(1:2500);
3     deaths=data.new_deaths(1:2500);
4     totalcase=0;
5     totaldeath=0;
6     validdays=0;
7     day=1;
8     while day <=2500
9         if ~isnan(cases(day))&& ~isnan(deaths(day))
10             totalcase=totalcase+cases(day);
11             totaldeath=totaldeath+deaths(day);
12             validdays=validdays+1;
13         end
14         day=day+1;
15         if validdays >0
16             avg_cases=totalcase/validdays;
17             avg_deaths=totaldeath/validdays;
18         else
19             avg_cases=NaN;
20             avg_deaths=NaN;
21         end
22     end
23     disp('---Trend Prediction---')
24     fprintf('Average New Cases (Overall): %0.2f\n', avg_cases)
25     fprintf('Predicted New Cases (Next Day): %0.2f\n', avg_cases)
26     fprintf('Average New Deaths (Overall): %0.2f\n', avg_deaths)
27     fprintf('Average New Deaths (Next Day): %0.2f\n', avg_deaths)
```

4) visualize_results.m

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main.m x descriptive_stats.m x predict_model.m x visualize_results.m x +
1 function visualize_results(data)
2     cases=data.new_cases(1:2500);
3     deaths=data.new_deaths(1:2500);
4     days=1:2500;
5     %2D
6     figure;
7     plot(days,cases,'r-','LineWidth',1.5);
8     title('New COVID-19 Cases Over Time')
9     xlabel('Days')
10    ylabel('New Cases');
11    grid on
12    %bar
13    figure;
14    bar(days,deaths,'Facecolor','r')
15    title('New COVID-19 Deaths Over Time')
16    xlabel('Days');
17    ylabel('New Deaths');
18    grid on;
19    %3D
20    figure;
21    scatter3(cases,deaths,days,'filled');
22    title('3D Scattar Plot: Cases vs Deaths');
23    xlabel('New Cases');
24    ylabel('New Deaths');
25    zlabel('Days');
26    grid on;
27 end
```

5) fit_regression_curve.m

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main.m x descriptive_stats.m x fit_regression_curve.m x predict_model.m x visualize_resul

1 function fit_regression_curve(data)
2 cases=data.new_cases (1:2500);
3 days=1:2500;
4 p=polyfit(days, cases,1);
5 yfit=polyval(p,days);
6 figure;
7 plot(days,cases,'b-','LineWidth',1.5);
8 hold on
9 plot(days,yfit,'r--','LineWidth',2);
10 title('COVID-19 Cases with Linear Fit');
11 xlabel('Days')
12 ylabel('New Cases');
13 legend('Actual Data', 'Linear Fit')
14 grid on
15 axis tight
16 ylim([min(cases)-10, max(cases)]);
17 end
18
```