

```

>> appdesigner
>> classdef Final < matlab.apps.AppBase

    % Properties that correspond to app components
    properties (Access = public)
        UIFigure                matlab.ui.Figure
        AirCleansessSliderLabel  matlab.ui.control.Label
        AirCleansessSlider       matlab.ui.control.Slider
        GoButton                 matlab.ui.control.Button
        PopularityLabel          matlab.ui.control.Label
        RecommendedCountryChoicesLabel matlab.ui.control.Label
        YearDropDownLabel        matlab.ui.control.Label
        YearDropDown             matlab.ui.control.DropDown
        Label                    matlab.ui.control.Label
        Label2                   matlab.ui.control.Label
        Label3                   matlab.ui.control.Label
        Label4                   matlab.ui.control.Label
        Label5                   matlab.ui.control.Label
        Label6                   matlab.ui.control.Label
        Label7                   matlab.ui.control.Label
        Label8                   matlab.ui.control.Label
        Label9                   matlab.ui.control.Label
        Label10                  matlab.ui.control.Label
        UIAxes                   matlab.ui.control.UIAxes
        AirCleansessButton       matlab.ui.control.Button
        PopularityButton         matlab.ui.control.Button
        Label11                  matlab.ui.control.Label
    end

    methods (Access = private)
        function s = pm25want(app)
            p=readtable('PM25.csv');
            pm=table2struct(p);
            %Find the mean population exposure in specific year
            s(1)=struct('name',' ','value',1);
            k=1;
            for i=1:13943
                if str2num(pm(i).Year)==str2num(app.YearDropDown.Value)
                    if strcmp(string(pm(i).Variable),"Mean population exposure to PM2.5")==1
                        s(k).name=pm(i).Country;
                        s(k).value=pm(i).Value;
                        k=k+1;
                    end
                end
            end
        end

        function s = tourwant(app)
            t=readtable('tourism.csv');
            tor=table2struct(t);
            %Find the overnight vistors(tourists) in specific year
            s(1)=struct('name',' ','value',1);
            k=1;
            for i=1:1676
                if str2num(tor(i).Year)==str2num(app.YearDropDown.Value)
                    if strcmp(string(tor(i).Variable),"Overnight visitors (tourists)")==1

```

```

        s(k).name=tor(i).Country;
        s(k).value=tor(i).Value;
        k=k+1;
    end
end

end

%Sort the countries by amount of PM2.5
function out=pm25sort(app,s)
for i=1:190
    indlow=i;
    for j=(i+1):191
        if s(j).value<s(indlow).value
            indlow=j;
        end
    end
    temp=s(i);
    s(i)=s(indlow);
    s(indlow)=temp;
end
out=s;
for k=1:191
    out(k).value=k;
end

end

%Sort the countries by number of overnight visitors
function out=toursort(app,t)
for i=1:(length(t)-1)
    indlow=i;
    for j=(i+1):length(t)
        if t(j).value>t(indlow).value
            indlow=j;
        end
    end
    temp=t(i);
    t(i)=t(indlow);
    t(indlow)=temp;
end
out=t;
for k=1:length(t)
    out(k).value=k;
end

end

%Sort the countries by the weight added by the slider
function out = finsort(app,s2,t2)
    n=1;
    r(1)=struct('name',' ','value',1);
    qpop=app.AirCleansessSlider.Value/100;
    qpm=1-qpap;
    for i=1:191
        for j=1:length(t2)
            if string(s2(i).name)==string(t2(j).name)
                r(n).name=s2(i).name;
                r(n).value=qpap*t2(j).value+qpm*s2(i).value;
                n=n+1;
            end
        end
    end
end

```

```

        end
    end
    for k=1:length(r)-1
        indlow=k;
        for l=(k+1):length(r)
            if r(l).value<r(indlow).value
                indlow=l;
            end
        end
        temp=r(k);
        r(k)=r(indlow);
        r(indlow)=temp;
    end
    out=r;
end

end

methods (Access = private)

    % Callback function
    function YearDropDownValueChanged(app, event)

    end

    % Button pushed function: GoButton
    function GoButtonPushed(app, event)
%Calculate the Top 10 Countries
        s=pm25want(app);
        t=tourwant(app);
        s2=pm25sort(app,s);
        t2=toursort(app,t);
        r=finsort(app,s2,t2);
%List the Top 10 Countries
        app.Label.Text=strcat('1.',r(1).name);
        app.Label2.Text=strcat('2.',r(2).name);
        app.Label3.Text=strcat('3.',r(3).name);
        app.Label4.Text=strcat('4.',r(4).name);
        app.Label5.Text=strcat('5.',r(5).name);
        app.Label6.Text=strcat('6.',r(6).name);
        app.Label7.Text=strcat('7.',r(7).name);
        app.Label8.Text=strcat('8.',r(8).name);
        app.Label9.Text=strcat('9.',r(9).name);
        app.Label10.Text=strcat('10.',r(10).name);
%Write to a file containing the Top 10 Countries
        fid=fopen('Top10.m','w');
        for i=1:10
            fprintf(fid,'%d.%f\n',i,r(i).name);
        end
        fclose(fid);
    end

    % Button pushed function: AirCleansnessButton
    function AirCleansnessButtonPushed(app, event)
        s=pm25want(app);
        t=tourwant(app);
        s2=pm25sort(app,s);
        t2=toursort(app,t);

```

```

        r=finsort(app,s2,t2);
        c=zeros(5);
    %Plot the chart of amount of PM2.5 of Top 5 Countries
    for i=1:5
        for j=1:191
            if string(s(j).name)==string(r(i).name)
                c(i)=s(j).value;
            end
        end
    end
    bar(app.UIAxes,1:5,c);
    app.Label11.Text='mg*m^(-3)';
end

% Button pushed function: PopularityButton
function PopularityButtonPushed(app, event)
    s=pm25want(app);
    t=tourwant(app);
    s2=pm25sort(app,s);
    t2=toursort(app,t);
    r=finsort(app,s2,t2);
    c=zeros(5);
    %Plot the chart of number of visitors of Top 5 Countries
    for i=1:5
        for j=1:length(t)
            if string(t(j).name)==string(r(i).name)
                c(i)=t(j).value;
            end
        end
    end
    bar(app.UIAxes,1:5,c);
    app.Label11.Text='Number';
end
end

% App initialization and construction
methods (Access = private)

    % Create UIFigure and components
    function createComponents(app)

        % Create UIFigure
        app.UIFigure = uifigure;
        app.UIFigure.Position = [100 100 640 480];
        app.UIFigure.Name = 'UI Figure';

        % Create AirCleanessSliderLabel
        app.AirCleanessSliderLabel = uilabel(app.UIFigure);
        app.AirCleanessSliderLabel.HorizontalAlignment = 'right';
        app.AirCleanessSliderLabel.Position = [75 100 73 22];
        app.AirCleanessSliderLabel.Text = 'Air Cleaness';

        % Create AirCleanessSlider
        app.AirCleanessSlider = uisliderr(app.UIFigure);
        app.AirCleanessSlider.MajorTicks = [];
        app.AirCleanessSlider.MajorTickLabels = {};
        app.AirCleanessSlider.MinorTicks = [];
        app.AirCleanessSlider.Position = [169 109 325 3];
    end
end

```

```
app.AirCleansessSlider.Value = 50;

% Create GoButton
app.GoButton = uibutton(app.UIFigure, 'push');
app.GoButton.ButtonPushedFcn = createCallbackFcn(app, @GoButtonPushed, true);
app.GoButton.Position = [282 41 100 22];
app.GoButton.Text = 'Go';

% Create PopularityLabel
app.PopularityLabel = uilabel(app.UIFigure);
app.PopularityLabel.HorizontalAlignment = 'right';
app.PopularityLabel.Position = [508 100 59 22];
app.PopularityLabel.Text = 'Popularity';

% Create RecommendedCountryChoicesLabel
app.RecommendedCountryChoicesLabel = uilabel(app.UIFigure);
app.RecommendedCountryChoicesLabel.FontSize = 20;
app.RecommendedCountryChoicesLabel.Position = [176 410 302 26];
app.RecommendedCountryChoicesLabel.Text = 'Recommended Country Choices';

% Create YearDropDownLabel
app.YearDropDownLabel = uilabel(app.UIFigure);
app.YearDropDownLabel.HorizontalAlignment = 'right';
app.YearDropDownLabel.Position = [260 166 29 22];
app.YearDropDownLabel.Text = 'Year';

% Create YearDropDown
app.YearDropDown = uidropdown(app.UIFigure);
app.YearDropDown.Items = {'2010', '2011', '2012', '2013', '2014', '2015',
'2016'};
app.YearDropDown.Editable = 'on';
app.YearDropDown.BackgroundColor = [1 1 1];
app.YearDropDown.Position = [304 166 100 22];
app.YearDropDown.Value = '2016';

% Create Label
app.Label = uilabel(app.UIFigure);
app.Label.Position = [322 367 141 22];
app.Label.Text = '1.Canada';

% Create Label2
app.Label2 = uilabel(app.UIFigure);
app.Label2.Position = [493 367 148 22];
app.Label2.Text = '2.Finland';

% Create Label3
app.Label3 = uilabel(app.UIFigure);
app.Label3.Position = [322 325 141 22];
app.Label3.Text = '3.Spain';

% Create Label4
app.Label4 = uilabel(app.UIFigure);
app.Label4.Position = [493 325 148 22];
app.Label4.Text = '4.Australia';

% Create Label5
app.Label5 = uilabel(app.UIFigure);
app.Label5.Position = [322 282 141 22];
```

```

    app.Label5.Text = '5.Japan';

    % Create Label6
    app.Label6 = uilabel(app.UIFigure);
    app.Label6.Position = [493 282 148 22];
    app.Label6.Text = '6.Norway';

    % Create Label7
    app.Label7 = uilabel(app.UIFigure);
    app.Label7.Position = [322 242 141 22];
    app.Label7.Text = '7.France';

    % Create Label8
    app.Label8 = uilabel(app.UIFigure);
    app.Label8.Position = [493 242 148 22];
    app.Label8.Text = '8.Ireland';

    % Create Label9
    app.Label9 = uilabel(app.UIFigure);
    app.Label9.Position = [322 202 141 22];
    app.Label9.Text = '9.Denmark';

    % Create Label10
    app.Label10 = uilabel(app.UIFigure);
    app.Label10.Position = [493 202 148 22];
    app.Label10.Text = '10.Portugal';

    % Create UIAxes
    app.UIAxes = uiaxes(app.UIFigure);
    xlabel(app.UIAxes, 'Top5')
    app.UIAxes.Position = [35 202 279 209];

    % Create AirCleanessButton
    app.AirCleanessButton = uibutton(app.UIFigure, 'push');
    app.AirCleanessButton.ButtonPushedFcn = createCallbackFcn(app, ↵
@AirCleanessButtonPushed, true);
    app.AirCleanessButton.Position = [62 100 100 22];
    app.AirCleanessButton.Text = 'Air Cleaness';

    % Create PopularityButton
    app.PopularityButton = uibutton(app.UIFigure, 'push');
    app.PopularityButton.ButtonPushedFcn = createCallbackFcn(app, ↵
@PopularityButtonPushed, true);
    app.PopularityButton.Position = [499 99 100 22];
    app.PopularityButton.Text = 'Popularity';

    % Create Label11
    app.Label11 = uilabel(app.UIFigure);
    app.Label11.VerticalAlignment = 'bottom';
    app.Label11.FontSize = 10;
    app.Label11.Position = [14 409 117 29];
    app.Label11.Text = '';
end
end

methods (Access = public)

    % Construct app

```

```
function app = Final

    % Create and configure components
    createComponents(app)

    % Register the app with App Designer
    registerApp(app, app.UIFigure)

    if nargin == 0
        clear app
    end
end

% Code that executes before app deletion
function delete(app)

    % Delete UIFigure when app is deleted
    delete(app.UIFigure)
end
end
end
```