```
classdef NASA_Test_1_exported < matlab.apps.AppBase

    % Properties that correspond to app components
    properties (Access = public)
        UIFigure                        matlab.ui.Figure
        GridLayout                      matlab.ui.container.GridLayout
        LeftPanel                       matlab.ui.container.Panel
        SetupPanel                      matlab.ui.container.Panel
        GridLayout2                     matlab.ui.container.GridLayout
        BasicChecksPanel                matlab.ui.container.Panel
        GridLayout3                     matlab.ui.container.GridLayout
        CheckButton                     matlab.ui.control.Button
        Lamp                            matlab.ui.control.Lamp
        EditField                       matlab.ui.control.EditField
        WiringCheckLabel                matlab.ui.control.Label
        TubingCheckLabel                matlab.ui.control.Label
        CheckButton_2                   matlab.ui.control.Button
        Lamp_2                          matlab.ui.control.Lamp
        ManualCheckLabel                matlab.ui.control.Label
        FlowSettingsPanel               matlab.ui.container.Panel
        GridLayout7                     matlab.ui.container.GridLayout
        O2Label                         matlab.ui.control.Label
        O2Spinner                       matlab.ui.control.Spinner
        N2SpinnerLabel                  matlab.ui.control.Label
        N2Spinner                       matlab.ui.control.Spinner
        WeightScaleResetPanel           matlab.ui.container.Panel
        GridLayout5                     matlab.ui.container.GridLayout
        ResetScaleButton                matlab.ui.control.Button
        InitialWeightLabel              matlab.ui.control.Label
        gEditFieldLabel                 matlab.ui.control.Label
        gEditField                      matlab.ui.control.NumericEditField
        ChamberBackfillPanel            matlab.ui.container.Panel
        GridLayout6                     matlab.ui.container.GridLayout
        EvacuateChamberButton           matlab.ui.control.Button
        kPaEditFieldLabel               matlab.ui.control.Label
        kPaEditField                    matlab.ui.control.NumericEditField
        PressureLabel                   matlab.ui.control.Label
        RefillChamberButton             matlab.ui.control.Button
        Lamp_3                          matlab.ui.control.Lamp
        Lamp_4                          matlab.ui.control.Lamp
        StartRunPanel                   matlab.ui.container.Panel
        GridLayout8                     matlab.ui.container.GridLayout
        IgnitionButton                  matlab.ui.control.Button
        Lamp_5                          matlab.ui.control.Lamp
        RetractIgniterButton            matlab.ui.control.Button
        Lamp_6                          matlab.ui.control.Lamp
        CenterPanel                     matlab.ui.container.Panel
        LivestreamPanel                 matlab.ui.container.Panel
        TabGroup                        matlab.ui.container.TabGroup
        LiveGraphsTab                   matlab.ui.container.Tab
        GridLayout14                    matlab.ui.container.GridLayout
```

```
TabGroup2                          matlab.ui.container.TabGroup
TemperatureTab                     matlab.ui.container.Tab
GridLayout15                       matlab.ui.container.GridLayout
UIAxes                             matlab.ui.control.UIAxes
RadiativeFluxTab                   matlab.ui.container.Tab
GridLayout15_2                     matlab.ui.container.GridLayout
UIAxes_2                           matlab.ui.control.UIAxes
ChangeinWeightTab                  matlab.ui.container.Tab
GridLayout15_3                     matlab.ui.container.GridLayout
UIAxes2                            matlab.ui.control.UIAxes
LiveTables                         matlab.ui.container.Tab
GridLayout16                       matlab.ui.container.GridLayout
UITable                            matlab.ui.control.Table
RightPanel                         matlab.ui.container.Panel
VitalsWarningsPanel                matlab.ui.container.Panel
GridLayout10                       matlab.ui.container.GridLayout
PressureSensorPanel                matlab.ui.container.Panel
GridLayout11                       matlab.ui.container.GridLayout
ChamberPressureEditFieldLabel      matlab.ui.control.Label
ChamberPressureEditField           matlab.ui.control.NumericEditField
kPaLabel                           matlab.ui.control.Label
Lamp_7                             matlab.ui.control.Lamp
SensorTemperatureEditFieldLabel    matlab.ui.control.Label
SensorTemperatureEditField         matlab.ui.control.NumericEditField
KLabel                             matlab.ui.control.Label
Lamp_8                             matlab.ui.control.Lamp
PaperIgnitedPanel                  matlab.ui.container.Panel
GridLayout12                       matlab.ui.container.GridLayout
PaperIgnitedCheckBox               matlab.ui.control.CheckBox
MassFlowControllersPanel           matlab.ui.container.Panel
GridLayout13                       matlab.ui.container.GridLayout
VolumetricFlowO2EditFieldLabel     matlab.ui.control.Label
VolumetricFlowO2EditField          matlab.ui.control.NumericEditField
ULabel                             matlab.ui.control.Label
VolumetricFlowN2EditFieldLabel     matlab.ui.control.Label
VolumetricFlowN2EditField          matlab.ui.control.NumericEditField
ULabel_2                           matlab.ui.control.Label
MassFlowO2EditFieldLabel           matlab.ui.control.Label
MassFlowO2EditField                matlab.ui.control.NumericEditField
MassFlowN2EditFieldLabel           matlab.ui.control.Label
MassFlowN2EditField                matlab.ui.control.NumericEditField
VolumetricFlowTotEditFieldLabel    matlab.ui.control.Label
VolumetricFlowTotEditField         matlab.ui.control.NumericEditField
MassFlowTotalEditFieldLabel        matlab.ui.control.Label
MassFlowTotalEditField             matlab.ui.control.NumericEditField
InletVelocityEditFieldLabel        matlab.ui.control.Label
InletVelocityEditField             matlab.ui.control.NumericEditField
ULabel_3                           matlab.ui.control.Label
ULabel_4                           matlab.ui.control.Label
ULabel_5                           matlab.ui.control.Label
ULabel_6                           matlab.ui.control.Label
```

```
        msLabel                         matlab.ui.control.Label
        DataTranscriptionPanel          matlab.ui.container.Panel
        GridLayout9                     matlab.ui.container.GridLayout
        ChooseFolderButton              matlab.ui.control.Button
        FolderSelectedEditFieldLabel    matlab.ui.control.Label
        FolderSelectedEditField         matlab.ui.control.EditField
        DocumentTitleEditFieldLabel     matlab.ui.control.Label
        DocumentTitleEditField          matlab.ui.control.EditField
        SendLiveButton                  matlab.ui.control.Button
    end

    % Properties that correspond to apps with auto-reflow
    properties (Access = private)
        onePanelWidth = 576;
        twoPanelWidth = 768;
    end


    properties (Access = public)
        f % Description
        ar %
        running %
        addrs%
        adc %
        WireReady
        TubeReady
        FlowReady
        ScaleReady
        Tab
        AllData
        Sensors
        Sensor_report
        Pressure_running
    end

    methods (Access = public)

        function Ready1(app)
            if (app.WireReady == 1) && (app.TubeReady == 1) && ...
                    (app.FlowReady == 1) && (app.ScaleReady == 1)
                set(app.ChamberBackfillPanel,'visible','on')
            end
        end

        function Ready2(app)
            if (app.ChamberReady == 1)
                set(app.StartRunPanel,'visible','on')
            end
        end
    end
```

```
    % Callbacks that handle component events
    methods (Access = private)

        % Code that executes after component creation
        function startupFcn(app)
            clear;clc;

            app.addrs = 1;
        end

        % Size changed function: ChamberBackfillPanel
        function ChamberBackfillPanelSizeChanged(app, event)
            position = app.ChamberBackfillPanel.Position;

        end

        % Callback function
        function ReadyButtonPushed(app, event)
            set(app.ChamberBackfillPanel,'visible','on')
            set(app.StartRunPanel,'visible','on')
        end

        % Button pushed function: ChooseFolderButton
        function ChooseFolderButtonPushed(app, event)
            selpath =  uigetdir;
            app.FolderSelectedEditField.Value = selpath;
        end

        % Button pushed function: IgnitionButton
        function IgnitionButtonPushed(app, event)
            app.running = 1;
            % Clock start
            t = seconds(0);

            %Initial Readings here
            v1 = readVoltage(app.adc,0);
            %T = app.Sensors.Thermocouple.readHotJunc();
            %F = app.Sensors.Radiometer.Read();
            %W = app.Sensors.Scale.Read();

            t_num = seconds(t);
            %Initiate Graphs/Tables=
            app.Tab = {t_num,v1};
            app.UITable.Data = [app.Tab];
            line = line(app.UIAxes,t,v1);
            %line1 = line(app.UIAxes,t,T);
            %line2 = line(app.UIAxes_2,t,F);
            %line3 = line(app.UIAxes_3,t,W);

            ylim(app.UIAxes,[3.41,3.43]);
```

```
            %Continuously runs, updates graphs/tables
            pause_len = .1;
            t(2) = t(1) + seconds(pause_len);
            i = 2;
            while (app.running)
                v1(i) = readVoltage(app.adc, 0);
                %T(i) = app.Sensors.Thermocouple.readHotJunc();
                %F(i) = app.Sensors.Radiometer.Read();
                %W(i) = app.Sensors.Scale.Read();
                pause(pause_len)

                t_num(i) = seconds(t(i));
                line.XData = [line.XData t(i)];
                line.YData = [line.YData v1(i)];

                %line1.XData = [line1.XData t(i)];
                %line2.XData = [line2.XData t(i)];
                %line3.XData = [line3.XData t(i)];

                %line1.YData = [line.YData T(i)];
                %line2.YData = [line.YData F(i)];
                %line3.YData = [line.YData W(i)];

                app.Tab = [app.Tab;{t_num(i),v1(i)}];
                app.UITable.Data = [app.Tab];

                if t<seconds(60)
                    xlim(app.UIAxes,[seconds(0),seconds(60)])
                else
                    xlim(app.UIAxes,[t(i)-seconds(60),t(i)])
                end


                i = i+1;
                t(i) = t(i-1) + seconds(pause_len);
            end

        end

        % Button pushed function: RetractIgniterButton
        function RetractIgniterButtonPushed(app, event)
            app.running = 0;
            app.Transducers.ArmMotor.Run(); %Play with the inputs later Duration,↙
DutyCycle
        end

        % Button pushed function: CheckButton
        function CheckButtonPushed(app, event)
            app.f = Func_Lib;
            app.ar = app.f.ConnectArduino();
```

```
        %[app.Sensors,app.Transducers] = app.f.Initialize(app.ar);
        %app.Sensor_report = app.f.SensorCheck();


        app.addrs = scanI2CBus(app.ar);
        app.adc = ads1115(app.ar, app.addrs{1});
        app.adc.VoltageScale = 4.096;

        app.FlowReady = 0;
        app.TubeReady = 0;
        app.ScaleReady = 0;
        app.WireReady = 1;

        app.Lamp.Color = 'green';



        Ready1(app);

        %Run livestream

    end

    % Button pushed function: CheckButton_2
    function CheckButton_2Pushed(app, event)
        app.TubeReady = 1;
        app.Lamp_2.Color = 'green';
        Ready1(app);
    end

    % Value changed function: O2Spinner
    function O2SpinnerValueChanged(app, event)
        value = app.O2Spinner.Value;
        if (value<=100) && (value>=0)
            app.N2Spinner.Value = 100-value;
        end

        app.FlowReady = 1;
        Ready1(app);
    end

    % Button pushed function: ResetScaleButton
    function ResetScaleButtonPushed(app, event)
        app.ScaleReady = 1;
        Ready1(app);


    end

    % Button pushed function: SendLiveButton
    function SendLiveButtonPushed(app, event)
```

```
            if ~isempty(app.DocumentTitleEditField.Value)
                fullname = append(app.FolderSelectedEditField.Value, app.↙
DocumentTitleEditField.Value);

                xlswrite(fullname,app.AllData);
            end
        end

        % Button pushed function: EvacuateChamberButton
        function EvacuateChamberButtonPushed(app, event)
            app.Pressure_running = 1;
            while app.Pressure_running
                %{
                [P,T_P] = app.Sensors.Pressure.Read();

                if P < -Insert Vacuum Pressure-
                    app.Lamp_3.Color = 'green';
                end

                if P > -Insert Max Chamber Pressure Here-
                    app.Lamp_7.Color = 'red';
                end

                if T_P > -Insert Max Chamber Temp Here- Help prevent damage to sensors-
                    app.Lamp_8.Color = 'red';
                end

                app.ChamberPressureEditField.Value = P;
                app.SensorTemperatureEditField.Value = T_P;

                pause(.1)
                %}
            end


        end

        % Value changed function: PaperIgnitedCheckBox
        function PaperIgnitedCheckBoxValueChanged(app, event)
            value = app.PaperIgnitedCheckBox.Value;

        end

        % Changes arrangement of the app based on UIFigure width
        function updateAppLayout(app, event)
            currentFigureWidth = app.UIFigure.Position(3);
            if(currentFigureWidth <= app.onePanelWidth)
                % Change to a 3x1 grid
                app.GridLayout.RowHeight = {886, 886, 886};
                app.GridLayout.ColumnWidth = {'1x'};
                app.CenterPanel.Layout.Row = 1;
```

```
                app.CenterPanel.Layout.Column = 1;
                app.LeftPanel.Layout.Row = 2;
                app.LeftPanel.Layout.Column = 1;
                app.RightPanel.Layout.Row = 3;
                app.RightPanel.Layout.Column = 1;
            elseif (currentFigureWidth > app.onePanelWidth && currentFigureWidth <= app.↙
twoPanelWidth)
                % Change to a 2x2 grid
                app.GridLayout.RowHeight = {886, 886};
                app.GridLayout.ColumnWidth = {'1x', '1x'};
                app.CenterPanel.Layout.Row = 1;
                app.CenterPanel.Layout.Column = [1,2];
                app.LeftPanel.Layout.Row = 2;
                app.LeftPanel.Layout.Column = 1;
                app.RightPanel.Layout.Row = 2;
                app.RightPanel.Layout.Column = 2;
            else
                % Change to a 1x3 grid
                app.GridLayout.RowHeight = {'1x'};
                app.GridLayout.ColumnWidth = {295, '1x', 297};
                app.LeftPanel.Layout.Row = 1;
                app.LeftPanel.Layout.Column = 1;
                app.CenterPanel.Layout.Row = 1;
                app.CenterPanel.Layout.Column = 2;
                app.RightPanel.Layout.Row = 1;
                app.RightPanel.Layout.Column = 3;
            end
        end
    end

    % Component initialization
    methods (Access = private)

        % Create UIFigure and components
        function createComponents(app)

            % Create UIFigure and hide until all components are created
            app.UIFigure = uifigure('Visible', 'off');
            app.UIFigure.AutoResizeChildren = 'off';
            app.UIFigure.Position = [100 100 1474 886];
            app.UIFigure.Name = 'UI Figure';
            app.UIFigure.SizeChangedFcn = createCallbackFcn(app, @updateAppLayout, true);

            % Create GridLayout
            app.GridLayout = uigridlayout(app.UIFigure);
            app.GridLayout.ColumnWidth = {295, '1x', 297};
            app.GridLayout.RowHeight = {'1x'};
            app.GridLayout.ColumnSpacing = 0;
            app.GridLayout.RowSpacing = 0;
            app.GridLayout.Padding = [0 0 0 0];
            app.GridLayout.Scrollable = 'on';
```

```
            % Create LeftPanel
            app.LeftPanel = uipanel(app.GridLayout);
            app.LeftPanel.Layout.Row = 1;
            app.LeftPanel.Layout.Column = 1;

            % Create SetupPanel
            app.SetupPanel = uipanel(app.LeftPanel);
            app.SetupPanel.TitlePosition = 'centertop';
            app.SetupPanel.Title = 'Setup';
            app.SetupPanel.FontWeight = 'bold';
            app.SetupPanel.Position = [11 177 270 698];

            % Create GridLayout2
            app.GridLayout2 = uigridlayout(app.SetupPanel);
            app.GridLayout2.RowHeight = {'fit', 'fit', 'fit', 'fit', 'fit'};

            % Create BasicChecksPanel
            app.BasicChecksPanel = uipanel(app.GridLayout2);
            app.BasicChecksPanel.TitlePosition = 'centertop';
            app.BasicChecksPanel.Title = 'Basic Checks';
            app.BasicChecksPanel.Layout.Row = 1;
            app.BasicChecksPanel.Layout.Column = [1 2];
            app.BasicChecksPanel.FontWeight = 'bold';

            % Create GridLayout3
            app.GridLayout3 = uigridlayout(app.BasicChecksPanel);
            app.GridLayout3.ColumnWidth = {'3x', 'fit'};
            app.GridLayout3.RowHeight = {'fit', '1x', '1x', 'fit', '1x', 'fit'};

            % Create CheckButton
            app.CheckButton = uibutton(app.GridLayout3, 'push');
            app.CheckButton.ButtonPushedFcn = createCallbackFcn(app, @CheckButtonPushed,↙
true);
            app.CheckButton.Layout.Row = 2;
            app.CheckButton.Layout.Column = 1;
            app.CheckButton.Text = 'Check';

            % Create Lamp
            app.Lamp = uilamp(app.GridLayout3);
            app.Lamp.Layout.Row = 2;
            app.Lamp.Layout.Column = 2;
            app.Lamp.Color = [1 0.4118 0.1608];

            % Create EditField
            app.EditField = uieditfield(app.GridLayout3, 'text');
            app.EditField.BackgroundColor = [0 1 1];
            app.EditField.Layout.Row = 3;
            app.EditField.Layout.Column = [1 2];
            app.EditField.Value = 'Not Run';
```

```
            % Create WiringCheckLabel
            app.WiringCheckLabel = uilabel(app.GridLayout3);
            app.WiringCheckLabel.HorizontalAlignment = 'center';
            app.WiringCheckLabel.FontWeight = 'bold';
            app.WiringCheckLabel.Layout.Row = 1;
            app.WiringCheckLabel.Layout.Column = [1 2];
            app.WiringCheckLabel.Text = 'Wiring Check';

            % Create TubingCheckLabel
            app.TubingCheckLabel = uilabel(app.GridLayout3);
            app.TubingCheckLabel.HorizontalAlignment = 'center';
            app.TubingCheckLabel.FontWeight = 'bold';
            app.TubingCheckLabel.Layout.Row = 4;
            app.TubingCheckLabel.Layout.Column = [1 2];
            app.TubingCheckLabel.Text = 'Tubing Check';

            % Create CheckButton_2
            app.CheckButton_2 = uibutton(app.GridLayout3, 'push');
            app.CheckButton_2.ButtonPushedFcn = createCallbackFcn(app,↙
@CheckButton_2Pushed, true);
            app.CheckButton_2.VerticalAlignment = 'top';
            app.CheckButton_2.Layout.Row = 5;
            app.CheckButton_2.Layout.Column = 1;
            app.CheckButton_2.Text = 'Check';

            % Create Lamp_2
            app.Lamp_2 = uilamp(app.GridLayout3);
            app.Lamp_2.Layout.Row = 5;
            app.Lamp_2.Layout.Column = 2;
            app.Lamp_2.Color = [1 0.4118 0.1608];

            % Create ManualCheckLabel
            app.ManualCheckLabel = uilabel(app.GridLayout3);
            app.ManualCheckLabel.HorizontalAlignment = 'center';
            app.ManualCheckLabel.FontSize = 11;
            app.ManualCheckLabel.Layout.Row = 6;
            app.ManualCheckLabel.Layout.Column = [1 2];
            app.ManualCheckLabel.Text = 'Manual Check';

            % Create FlowSettingsPanel
            app.FlowSettingsPanel = uipanel(app.GridLayout2);
            app.FlowSettingsPanel.TitlePosition = 'centertop';
            app.FlowSettingsPanel.Title = 'Flow Settings';
            app.FlowSettingsPanel.Layout.Row = 2;
            app.FlowSettingsPanel.Layout.Column = [1 2];
            app.FlowSettingsPanel.FontWeight = 'bold';

            % Create GridLayout7
            app.GridLayout7 = uigridlayout(app.FlowSettingsPanel);
            app.GridLayout7.ColumnWidth = {'fit', '1x'};
```

```
            % Create O2Label
            app.O2Label = uilabel(app.GridLayout7);
            app.O2Label.HorizontalAlignment = 'right';
            app.O2Label.Layout.Row = 1;
            app.O2Label.Layout.Column = 1;
            app.O2Label.Text = 'O2 %';

            % Create O2Spinner
            app.O2Spinner = uispinner(app.GridLayout7);
            app.O2Spinner.ValueChangedFcn = createCallbackFcn(app,↙
@O2SpinnerValueChanged, true);
            app.O2Spinner.Layout.Row = 1;
            app.O2Spinner.Layout.Column = 2;

            % Create N2SpinnerLabel
            app.N2SpinnerLabel = uilabel(app.GridLayout7);
            app.N2SpinnerLabel.HorizontalAlignment = 'right';
            app.N2SpinnerLabel.Layout.Row = 2;
            app.N2SpinnerLabel.Layout.Column = 1;
            app.N2SpinnerLabel.Text = 'N2 %';

            % Create N2Spinner
            app.N2Spinner = uispinner(app.GridLayout7);
            app.N2Spinner.BackgroundColor = [0 1 1];
            app.N2Spinner.Layout.Row = 2;
            app.N2Spinner.Layout.Column = 2;

            % Create WeightScaleResetPanel
            app.WeightScaleResetPanel = uipanel(app.GridLayout2);
            app.WeightScaleResetPanel.TitlePosition = 'centertop';
            app.WeightScaleResetPanel.Title = 'Weight Scale Reset';
            app.WeightScaleResetPanel.Layout.Row = 3;
            app.WeightScaleResetPanel.Layout.Column = [1 2];
            app.WeightScaleResetPanel.FontWeight = 'bold';

            % Create GridLayout5
            app.GridLayout5 = uigridlayout(app.WeightScaleResetPanel);
            app.GridLayout5.ColumnWidth = {'1x', '1x', 'fit'};

            % Create ResetScaleButton
            app.ResetScaleButton = uibutton(app.GridLayout5, 'push');
            app.ResetScaleButton.ButtonPushedFcn = createCallbackFcn(app,↙
@ResetScaleButtonPushed, true);
            app.ResetScaleButton.Layout.Row = 2;
            app.ResetScaleButton.Layout.Column = [1 2];
            app.ResetScaleButton.Text = 'Reset Scale';

            % Create InitialWeightLabel
            app.InitialWeightLabel = uilabel(app.GridLayout5);
            app.InitialWeightLabel.HorizontalAlignment = 'center';
            app.InitialWeightLabel.Layout.Row = 1;
```

```
            app.InitialWeightLabel.Layout.Column = 1;
            app.InitialWeightLabel.Text = 'Initial Weight';

            % Create gEditFieldLabel
            app.gEditFieldLabel = uilabel(app.GridLayout5);
            app.gEditFieldLabel.Layout.Row = 1;
            app.gEditFieldLabel.Layout.Column = 3;
            app.gEditFieldLabel.Text = 'g';

            % Create gEditField
            app.gEditField = uieditfield(app.GridLayout5, 'numeric');
            app.gEditField.Layout.Row = 1;
            app.gEditField.Layout.Column = 2;

            % Create ChamberBackfillPanel
            app.ChamberBackfillPanel = uipanel(app.GridLayout2);
            app.ChamberBackfillPanel.TitlePosition = 'centertop';
            app.ChamberBackfillPanel.Title = 'Chamber Backfill';
            app.ChamberBackfillPanel.SizeChangedFcn = createCallbackFcn(app,↙
@ChamberBackfillPanelSizeChanged, true);
            app.ChamberBackfillPanel.Layout.Row = 4;
            app.ChamberBackfillPanel.Layout.Column = [1 2];
            app.ChamberBackfillPanel.FontWeight = 'bold';

            % Create GridLayout6
            app.GridLayout6 = uigridlayout(app.ChamberBackfillPanel);
            app.GridLayout6.ColumnWidth = {'1x', '1x', 'fit'};
            app.GridLayout6.RowHeight = {'1x', '1x', '1x'};

            % Create EvacuateChamberButton
            app.EvacuateChamberButton = uibutton(app.GridLayout6, 'push');
            app.EvacuateChamberButton.ButtonPushedFcn = createCallbackFcn(app,↙
@EvacuateChamberButtonPushed, true);
            app.EvacuateChamberButton.Layout.Row = 1;
            app.EvacuateChamberButton.Layout.Column = [1 2];
            app.EvacuateChamberButton.Text = 'Evacuate Chamber';

            % Create kPaEditFieldLabel
            app.kPaEditFieldLabel = uilabel(app.GridLayout6);
            app.kPaEditFieldLabel.Layout.Row = 3;
            app.kPaEditFieldLabel.Layout.Column = 3;
            app.kPaEditFieldLabel.Text = 'kPa';

            % Create kPaEditField
            app.kPaEditField = uieditfield(app.GridLayout6, 'numeric');
            app.kPaEditField.BackgroundColor = [0 1 1];
            app.kPaEditField.Layout.Row = 3;
            app.kPaEditField.Layout.Column = 2;

            % Create PressureLabel
            app.PressureLabel = uilabel(app.GridLayout6);
```

```
            app.PressureLabel.HorizontalAlignment = 'center';
            app.PressureLabel.Layout.Row = 3;
            app.PressureLabel.Layout.Column = 1;
            app.PressureLabel.Text = 'Pressure:';

            % Create RefillChamberButton
            app.RefillChamberButton = uibutton(app.GridLayout6, 'push');
            app.RefillChamberButton.Layout.Row = 2;
            app.RefillChamberButton.Layout.Column = [1 2];
            app.RefillChamberButton.Text = 'Refill Chamber';

            % Create Lamp_3
            app.Lamp_3 = uilamp(app.GridLayout6);
            app.Lamp_3.Layout.Row = 1;
            app.Lamp_3.Layout.Column = 3;
            app.Lamp_3.Color = [1 0.4118 0.1608];

            % Create Lamp_4
            app.Lamp_4 = uilamp(app.GridLayout6);
            app.Lamp_4.Layout.Row = 2;
            app.Lamp_4.Layout.Column = 3;
            app.Lamp_4.Color = [1 0.4118 0.1608];

            % Create StartRunPanel
            app.StartRunPanel = uipanel(app.GridLayout2);
            app.StartRunPanel.TitlePosition = 'centertop';
            app.StartRunPanel.Title = 'Start Run';
            app.StartRunPanel.Layout.Row = 5;
            app.StartRunPanel.Layout.Column = [1 2];
            app.StartRunPanel.FontWeight = 'bold';

            % Create GridLayout8
            app.GridLayout8 = uigridlayout(app.StartRunPanel);
            app.GridLayout8.ColumnWidth = {'1x', '1x', 'fit'};

            % Create IgnitionButton
            app.IgnitionButton = uibutton(app.GridLayout8, 'push');
            app.IgnitionButton.ButtonPushedFcn = createCallbackFcn(app,↙
@IgnitionButtonPushed, true);
            app.IgnitionButton.Layout.Row = 1;
            app.IgnitionButton.Layout.Column = [1 2];
            app.IgnitionButton.Text = 'Ignition';

            % Create Lamp_5
            app.Lamp_5 = uilamp(app.GridLayout8);
            app.Lamp_5.Layout.Row = 1;
            app.Lamp_5.Layout.Column = 3;
            app.Lamp_5.Color = [1 0.4118 0.1608];

            % Create RetractIgniterButton
            app.RetractIgniterButton = uibutton(app.GridLayout8, 'push');
```

```
            app.RetractIgniterButton.ButtonPushedFcn = createCallbackFcn(app,↙
@RetractIgniterButtonPushed, true);
            app.RetractIgniterButton.Layout.Row = 2;
            app.RetractIgniterButton.Layout.Column = [1 2];
            app.RetractIgniterButton.Text = 'Retract Igniter';

            % Create Lamp_6
            app.Lamp_6 = uilamp(app.GridLayout8);
            app.Lamp_6.Layout.Row = 2;
            app.Lamp_6.Layout.Column = 3;
            app.Lamp_6.Color = [1 0.4118 0.1608];

            % Create CenterPanel
            app.CenterPanel = uipanel(app.GridLayout);
            app.CenterPanel.Layout.Row = 1;
            app.CenterPanel.Layout.Column = 2;

            % Create LivestreamPanel
            app.LivestreamPanel = uipanel(app.CenterPanel);
            app.LivestreamPanel.TitlePosition = 'centertop';
            app.LivestreamPanel.Title = 'Livestream';
            app.LivestreamPanel.FontWeight = 'bold';
            app.LivestreamPanel.Position = [161 525 560 330];

            % Create TabGroup
            app.TabGroup = uitabgroup(app.CenterPanel);
            app.TabGroup.Position = [31 34 810 441];

            % Create LiveGraphsTab
            app.LiveGraphsTab = uitab(app.TabGroup);
            app.LiveGraphsTab.Title = 'Live Graphs';

            % Create GridLayout14
            app.GridLayout14 = uigridlayout(app.LiveGraphsTab);
            app.GridLayout14.ColumnWidth = {'1x'};
            app.GridLayout14.RowHeight = {'1x'};

            % Create TabGroup2
            app.TabGroup2 = uitabgroup(app.GridLayout14);
            app.TabGroup2.Layout.Row = 1;
            app.TabGroup2.Layout.Column = 1;

            % Create TemperatureTab
            app.TemperatureTab = uitab(app.TabGroup2);
            app.TemperatureTab.Title = 'Temperature';

            % Create GridLayout15
            app.GridLayout15 = uigridlayout(app.TemperatureTab);
            app.GridLayout15.ColumnWidth = {'1x'};
            app.GridLayout15.RowHeight = {'1x'};
```

```
% Create UIAxes
app.UIAxes = uiaxes(app.GridLayout15);
title(app.UIAxes, 'Temperature vs Time')
xlabel(app.UIAxes, 't')
ylabel(app.UIAxes, 'T(C)')
app.UIAxes.PlotBoxAspectRatio = [2.44557823129252 1 1];
app.UIAxes.Layout.Row = 1;
app.UIAxes.Layout.Column = 1;

% Create RadiativeFluxTab
app.RadiativeFluxTab = uitab(app.TabGroup2);
app.RadiativeFluxTab.Title = 'Radiative Flux';

% Create GridLayout15_2
app.GridLayout15_2 = uigridlayout(app.RadiativeFluxTab);
app.GridLayout15_2.ColumnWidth = {'1x'};
app.GridLayout15_2.RowHeight = {'1x'};

% Create UIAxes_2
app.UIAxes_2 = uiaxes(app.GridLayout15_2);
title(app.UIAxes_2, 'Radiative Flux vs Time')
xlabel(app.UIAxes_2, 't')
ylabel(app.UIAxes_2, 'Radiaitive Flux(mW/cm^2)')
app.UIAxes_2.PlotBoxAspectRatio = [2.42372881355932 1 1];
app.UIAxes_2.Layout.Row = 1;
app.UIAxes_2.Layout.Column = 1;

% Create ChangeinWeightTab
app.ChangeinWeightTab = uitab(app.TabGroup2);
app.ChangeinWeightTab.Title = 'Change in Weight';

% Create GridLayout15_3
app.GridLayout15_3 = uigridlayout(app.ChangeinWeightTab);
app.GridLayout15_3.ColumnWidth = {'1x'};
app.GridLayout15_3.RowHeight = {'1x'};

% Create UIAxes2
app.UIAxes2 = uiaxes(app.GridLayout15_3);
title(app.UIAxes2, 'Change in Weight vs Time')
xlabel(app.UIAxes2, 't')
ylabel(app.UIAxes2, 'Change in Weight(g)')
app.UIAxes2.PlotBoxAspectRatio = [2.44557823129252 1 1];
app.UIAxes2.Layout.Row = 1;
app.UIAxes2.Layout.Column = 1;

% Create LiveTables
app.LiveTables = uitab(app.TabGroup);
app.LiveTables.Title = 'Live Tables';

% Create GridLayout16
app.GridLayout16 = uigridlayout(app.LiveTables);
```

```
            app.GridLayout16.ColumnWidth = {'1x'};
            app.GridLayout16.RowHeight = {'1x'};

            % Create UITable
            app.UITable = uitable(app.GridLayout16);
            app.UITable.ColumnName = {'Time'; 'Temperature'; 'Radiative Flux'; 'Change in↙
Weight'};
            app.UITable.RowName = {};
            app.UITable.Layout.Row = 1;
            app.UITable.Layout.Column = 1;

            % Create RightPanel
            app.RightPanel = uipanel(app.GridLayout);
            app.RightPanel.Layout.Row = 1;
            app.RightPanel.Layout.Column = 3;

            % Create VitalsWarningsPanel
            app.VitalsWarningsPanel = uipanel(app.RightPanel);
            app.VitalsWarningsPanel.TitlePosition = 'centertop';
            app.VitalsWarningsPanel.Title = 'Vitals??/Warnings';
            app.VitalsWarningsPanel.FontWeight = 'bold';
            app.VitalsWarningsPanel.Position = [11 405 270 470];

            % Create GridLayout10
            app.GridLayout10 = uigridlayout(app.VitalsWarningsPanel);
            app.GridLayout10.RowHeight = {'fit', 'fit', 'fit'};

            % Create PressureSensorPanel
            app.PressureSensorPanel = uipanel(app.GridLayout10);
            app.PressureSensorPanel.TitlePosition = 'centertop';
            app.PressureSensorPanel.Title = 'Pressure Sensor';
            app.PressureSensorPanel.Layout.Row = 2;
            app.PressureSensorPanel.Layout.Column = [1 2];
            app.PressureSensorPanel.FontWeight = 'bold';

            % Create GridLayout11
            app.GridLayout11 = uigridlayout(app.PressureSensorPanel);
            app.GridLayout11.ColumnWidth = {'fit', '1x', 'fit', 'fit'};

            % Create ChamberPressureEditFieldLabel
            app.ChamberPressureEditFieldLabel = uilabel(app.GridLayout11);
            app.ChamberPressureEditFieldLabel.HorizontalAlignment = 'right';
            app.ChamberPressureEditFieldLabel.Layout.Row = 1;
            app.ChamberPressureEditFieldLabel.Layout.Column = 1;
            app.ChamberPressureEditFieldLabel.Text = 'Chamber Pressure';

            % Create ChamberPressureEditField
            app.ChamberPressureEditField = uieditfield(app.GridLayout11, 'numeric');
            app.ChamberPressureEditField.BackgroundColor = [0 1 1];
            app.ChamberPressureEditField.Layout.Row = 1;
            app.ChamberPressureEditField.Layout.Column = 2;
```

```
% Create kPaLabel
app.kPaLabel = uilabel(app.GridLayout11);
app.kPaLabel.Layout.Row = 1;
app.kPaLabel.Layout.Column = 3;
app.kPaLabel.Text = 'kPa';

% Create Lamp_7
app.Lamp_7 = uilamp(app.GridLayout11);
app.Lamp_7.Layout.Row = 1;
app.Lamp_7.Layout.Column = 4;

% Create SensorTemperatureEditFieldLabel
app.SensorTemperatureEditFieldLabel = uilabel(app.GridLayout11);
app.SensorTemperatureEditFieldLabel.HorizontalAlignment = 'right';
app.SensorTemperatureEditFieldLabel.Layout.Row = 2;
app.SensorTemperatureEditFieldLabel.Layout.Column = 1;
app.SensorTemperatureEditFieldLabel.Text = 'Sensor Temperature';

% Create SensorTemperatureEditField
app.SensorTemperatureEditField = uieditfield(app.GridLayout11, 'numeric');
app.SensorTemperatureEditField.BackgroundColor = [0 1 1];
app.SensorTemperatureEditField.Layout.Row = 2;
app.SensorTemperatureEditField.Layout.Column = 2;

% Create KLabel
app.KLabel = uilabel(app.GridLayout11);
app.KLabel.Layout.Row = 2;
app.KLabel.Layout.Column = 3;
app.KLabel.Text = 'K';

% Create Lamp_8
app.Lamp_8 = uilamp(app.GridLayout11);
app.Lamp_8.Layout.Row = 2;
app.Lamp_8.Layout.Column = 4;

% Create PaperIgnitedPanel
app.PaperIgnitedPanel = uipanel(app.GridLayout10);
app.PaperIgnitedPanel.TitlePosition = 'centertop';
app.PaperIgnitedPanel.Title = 'Paper Ignited';
app.PaperIgnitedPanel.Layout.Row = 3;
app.PaperIgnitedPanel.Layout.Column = [1 2];
app.PaperIgnitedPanel.FontWeight = 'bold';

% Create GridLayout12
app.GridLayout12 = uigridlayout(app.PaperIgnitedPanel);
app.GridLayout12.ColumnWidth = {'1x'};
app.GridLayout12.RowHeight = {'fit'};

% Create PaperIgnitedCheckBox
app.PaperIgnitedCheckBox = uicheckbox(app.GridLayout12);
```

```
            app.PaperIgnitedCheckBox.ValueChangedFcn = createCallbackFcn(app,↙
@PaperIgnitedCheckBoxValueChanged, true);
            app.PaperIgnitedCheckBox.Text = 'Paper Ignited';
            app.PaperIgnitedCheckBox.Layout.Row = 1;
            app.PaperIgnitedCheckBox.Layout.Column = 1;

            % Create MassFlowControllersPanel
            app.MassFlowControllersPanel = uipanel(app.GridLayout10);
            app.MassFlowControllersPanel.TitlePosition = 'centertop';
            app.MassFlowControllersPanel.Title = 'Mass Flow Controllers';
            app.MassFlowControllersPanel.Layout.Row = 1;
            app.MassFlowControllersPanel.Layout.Column = [1 2];
            app.MassFlowControllersPanel.FontWeight = 'bold';

            % Create GridLayout13
            app.GridLayout13 = uigridlayout(app.MassFlowControllersPanel);
            app.GridLayout13.ColumnWidth = {'fit', '1x', 'fit'};
            app.GridLayout13.RowHeight = {'1x', '1x', '1x', '1x', '1x', '1x', '1x'};

            % Create VolumetricFlowO2EditFieldLabel
            app.VolumetricFlowO2EditFieldLabel = uilabel(app.GridLayout13);
            app.VolumetricFlowO2EditFieldLabel.HorizontalAlignment = 'right';
            app.VolumetricFlowO2EditFieldLabel.Layout.Row = 1;
            app.VolumetricFlowO2EditFieldLabel.Layout.Column = 1;
            app.VolumetricFlowO2EditFieldLabel.Text = 'Volumetric Flow O2';

            % Create VolumetricFlowO2EditField
            app.VolumetricFlowO2EditField = uieditfield(app.GridLayout13, 'numeric');
            app.VolumetricFlowO2EditField.BackgroundColor = [0 1 1];
            app.VolumetricFlowO2EditField.Layout.Row = 1;
            app.VolumetricFlowO2EditField.Layout.Column = 2;

            % Create ULabel
            app.ULabel = uilabel(app.GridLayout13);
            app.ULabel.BackgroundColor = [1 0 0];
            app.ULabel.Layout.Row = 1;
            app.ULabel.Layout.Column = 3;
            app.ULabel.Text = 'U';

            % Create VolumetricFlowN2EditFieldLabel
            app.VolumetricFlowN2EditFieldLabel = uilabel(app.GridLayout13);
            app.VolumetricFlowN2EditFieldLabel.HorizontalAlignment = 'right';
            app.VolumetricFlowN2EditFieldLabel.Layout.Row = 2;
            app.VolumetricFlowN2EditFieldLabel.Layout.Column = 1;
            app.VolumetricFlowN2EditFieldLabel.Text = 'Volumetric Flow N2';

            % Create VolumetricFlowN2EditField
            app.VolumetricFlowN2EditField = uieditfield(app.GridLayout13, 'numeric');
            app.VolumetricFlowN2EditField.BackgroundColor = [0 1 1];
            app.VolumetricFlowN2EditField.Layout.Row = 2;
            app.VolumetricFlowN2EditField.Layout.Column = 2;
```

```
% Create ULabel_2
app.ULabel_2 = uilabel(app.GridLayout13);
app.ULabel_2.BackgroundColor = [1 0 0];
app.ULabel_2.Layout.Row = 2;
app.ULabel_2.Layout.Column = 3;
app.ULabel_2.Text = 'U';

% Create MassFlowO2EditFieldLabel
app.MassFlowO2EditFieldLabel = uilabel(app.GridLayout13);
app.MassFlowO2EditFieldLabel.HorizontalAlignment = 'right';
app.MassFlowO2EditFieldLabel.Layout.Row = 4;
app.MassFlowO2EditFieldLabel.Layout.Column = 1;
app.MassFlowO2EditFieldLabel.Text = 'Mass Flow O2';

% Create MassFlowO2EditField
app.MassFlowO2EditField = uieditfield(app.GridLayout13, 'numeric');
app.MassFlowO2EditField.BackgroundColor = [0 1 1];
app.MassFlowO2EditField.Layout.Row = 4;
app.MassFlowO2EditField.Layout.Column = 2;

% Create MassFlowN2EditFieldLabel
app.MassFlowN2EditFieldLabel = uilabel(app.GridLayout13);
app.MassFlowN2EditFieldLabel.HorizontalAlignment = 'right';
app.MassFlowN2EditFieldLabel.Layout.Row = 5;
app.MassFlowN2EditFieldLabel.Layout.Column = 1;
app.MassFlowN2EditFieldLabel.Text = 'Mass Flow N2';

% Create MassFlowN2EditField
app.MassFlowN2EditField = uieditfield(app.GridLayout13, 'numeric');
app.MassFlowN2EditField.BackgroundColor = [0 1 1];
app.MassFlowN2EditField.Layout.Row = 5;
app.MassFlowN2EditField.Layout.Column = 2;

% Create VolumetricFlowTotEditFieldLabel
app.VolumetricFlowTotEditFieldLabel = uilabel(app.GridLayout13);
app.VolumetricFlowTotEditFieldLabel.HorizontalAlignment = 'right';
app.VolumetricFlowTotEditFieldLabel.Layout.Row = 3;
app.VolumetricFlowTotEditFieldLabel.Layout.Column = 1;
app.VolumetricFlowTotEditFieldLabel.Text = 'Volumetric Flow Tot.';

% Create VolumetricFlowTotEditField
app.VolumetricFlowTotEditField = uieditfield(app.GridLayout13, 'numeric');
app.VolumetricFlowTotEditField.BackgroundColor = [0 1 1];
app.VolumetricFlowTotEditField.Layout.Row = 3;
app.VolumetricFlowTotEditField.Layout.Column = 2;

% Create MassFlowTotalEditFieldLabel
app.MassFlowTotalEditFieldLabel = uilabel(app.GridLayout13);
app.MassFlowTotalEditFieldLabel.HorizontalAlignment = 'right';
app.MassFlowTotalEditFieldLabel.Layout.Row = 6;
```

```
app.MassFlowTotalEditFieldLabel.Layout.Column = 1;
app.MassFlowTotalEditFieldLabel.Text = 'Mass Flow Total';

% Create MassFlowTotalEditField
app.MassFlowTotalEditField = uieditfield(app.GridLayout13, 'numeric');
app.MassFlowTotalEditField.BackgroundColor = [0 1 1];
app.MassFlowTotalEditField.Layout.Row = 6;
app.MassFlowTotalEditField.Layout.Column = 2;

% Create InletVelocityEditFieldLabel
app.InletVelocityEditFieldLabel = uilabel(app.GridLayout13);
app.InletVelocityEditFieldLabel.HorizontalAlignment = 'right';
app.InletVelocityEditFieldLabel.Layout.Row = 7;
app.InletVelocityEditFieldLabel.Layout.Column = 1;
app.InletVelocityEditFieldLabel.Text = 'Inlet Velocity';

% Create InletVelocityEditField
app.InletVelocityEditField = uieditfield(app.GridLayout13, 'numeric');
app.InletVelocityEditField.BackgroundColor = [0 1 1];
app.InletVelocityEditField.Layout.Row = 7;
app.InletVelocityEditField.Layout.Column = 2;

% Create ULabel_3
app.ULabel_3 = uilabel(app.GridLayout13);
app.ULabel_3.BackgroundColor = [1 0 0];
app.ULabel_3.Layout.Row = 3;
app.ULabel_3.Layout.Column = 3;
app.ULabel_3.Text = 'U';

% Create ULabel_4
app.ULabel_4 = uilabel(app.GridLayout13);
app.ULabel_4.BackgroundColor = [1 0 0];
app.ULabel_4.Layout.Row = 4;
app.ULabel_4.Layout.Column = 3;
app.ULabel_4.Text = 'U';

% Create ULabel_5
app.ULabel_5 = uilabel(app.GridLayout13);
app.ULabel_5.BackgroundColor = [1 0 0];
app.ULabel_5.Layout.Row = 5;
app.ULabel_5.Layout.Column = 3;
app.ULabel_5.Text = 'U';

% Create ULabel_6
app.ULabel_6 = uilabel(app.GridLayout13);
app.ULabel_6.BackgroundColor = [1 0 0];
app.ULabel_6.Layout.Row = 6;
app.ULabel_6.Layout.Column = 3;
app.ULabel_6.Text = 'U';

% Create msLabel
```

```
            app.msLabel = uilabel(app.GridLayout13);
            app.msLabel.Layout.Row = 7;
            app.msLabel.Layout.Column = 3;
            app.msLabel.Text = 'm/s';

            % Create DataTranscriptionPanel
            app.DataTranscriptionPanel = uipanel(app.RightPanel);
            app.DataTranscriptionPanel.TitlePosition = 'centertop';
            app.DataTranscriptionPanel.Title = 'Data Transcription';
            app.DataTranscriptionPanel.FontWeight = 'bold';
            app.DataTranscriptionPanel.Position = [11 232 270 163];

            % Create GridLayout9
            app.GridLayout9 = uigridlayout(app.DataTranscriptionPanel);
            app.GridLayout9.ColumnWidth = {'fit', '1x'};
            app.GridLayout9.RowHeight = {'fit', 'fit', 'fit', 'fit'};

            % Create ChooseFolderButton
            app.ChooseFolderButton = uibutton(app.GridLayout9, 'push');
            app.ChooseFolderButton.ButtonPushedFcn = createCallbackFcn(app,↙
@ChooseFolderButtonPushed, true);
            app.ChooseFolderButton.Layout.Row = 1;
            app.ChooseFolderButton.Layout.Column = [1 2];
            app.ChooseFolderButton.Text = 'Choose Folder';

            % Create FolderSelectedEditFieldLabel
            app.FolderSelectedEditFieldLabel = uilabel(app.GridLayout9);
            app.FolderSelectedEditFieldLabel.HorizontalAlignment = 'right';
            app.FolderSelectedEditFieldLabel.Layout.Row = 2;
            app.FolderSelectedEditFieldLabel.Layout.Column = 1;
            app.FolderSelectedEditFieldLabel.Text = 'Folder Selected:';

            % Create FolderSelectedEditField
            app.FolderSelectedEditField = uieditfield(app.GridLayout9, 'text');
            app.FolderSelectedEditField.BackgroundColor = [0 1 1];
            app.FolderSelectedEditField.Layout.Row = 2;
            app.FolderSelectedEditField.Layout.Column = 2;

            % Create DocumentTitleEditFieldLabel
            app.DocumentTitleEditFieldLabel = uilabel(app.GridLayout9);
            app.DocumentTitleEditFieldLabel.HorizontalAlignment = 'right';
            app.DocumentTitleEditFieldLabel.Layout.Row = 3;
            app.DocumentTitleEditFieldLabel.Layout.Column = 1;
            app.DocumentTitleEditFieldLabel.Text = 'Document Title:';

            % Create DocumentTitleEditField
            app.DocumentTitleEditField = uieditfield(app.GridLayout9, 'text');
            app.DocumentTitleEditField.Layout.Row = 3;
            app.DocumentTitleEditField.Layout.Column = 2;

            % Create SendLiveButton
```

```
            app.SendLiveButton = uibutton(app.GridLayout9, 'push');
            app.SendLiveButton.ButtonPushedFcn = createCallbackFcn(app,↙
@SendLiveButtonPushed, true);
            app.SendLiveButton.Layout.Row = 4;
            app.SendLiveButton.Layout.Column = [1 2];
            app.SendLiveButton.Text = 'Send Live';

            % Show the figure after all components are created
            app.UIFigure.Visible = 'on';
        end
    end

    % App creation and deletion
    methods (Access = public)

        % Construct app
        function app = NASA_Test_1_exported

            % Create UIFigure and components
            createComponents(app)

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

            % Execute the startup function
            runStartupFcn(app, @startupFcn)

            if nargout == 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
```