```matlab
classdef MedidorArmonicos < matlab.apps.AppBase
    % Properties that correspond to app components
    properties (Access = public)
        ProgramacinAvanzadaDiegoVillegasGoveaUIFigure  matlab.ui.Figure
        MedidordeArmnicosLabel        matlab.ui.control.Label
        Label                         matlab.ui.control.Label
        Panel                         matlab.ui.container.Panel
        InyeccindeArmnicosPanel       matlab.ui.container.Panel
        TercerarmnicoCheckBox         matlab.ui.control.CheckBox
        QuintoarmnicoCheckBox         matlab.ui.control.CheckBox
        SptimoarmnicoCheckBox         matlab.ui.control.CheckBox
        OnceavoarmnicoCheckBox        matlab.ui.control.CheckBox
        FundamentalCheckBox           matlab.ui.control.CheckBox
        NdeCiclosSpinnerLabel         matlab.ui.control.Label
        NdeCiclosSpinner              matlab.ui.control.Spinner
        FundamentalPanel              matlab.ui.container.Panel
        AmplitudEditFieldLabel        matlab.ui.control.Label
        AmplitudEditField             matlab.ui.control.NumericEditField
        FrecuenciaEditFieldLabel      matlab.ui.control.Label
        FrecuenciaEditField           matlab.ui.control.NumericEditField
        VLabel_2                      matlab.ui.control.Label
        HzLabel_6                     matlab.ui.control.Label
        AmplituddelosArmnicosPanel    matlab.ui.container.Panel
        erarmnicoEditFieldLabel       matlab.ui.control.Label
        erarmnicoEditField            matlab.ui.control.NumericEditField
        toarmnicoEditFieldLabel       matlab.ui.control.Label
        toarmnicoEditField            matlab.ui.control.NumericEditField
        moarmnicoEditFieldLabel       matlab.ui.control.Label
        moarmnicoEditField            matlab.ui.control.NumericEditField
        voarmnicoEditFieldLabel       matlab.ui.control.Label
        voarmnicoEditField            matlab.ui.control.NumericEditField
        VLabel_3                      matlab.ui.control.Label
        VLabel_4                      matlab.ui.control.Label
        VLabel_5                      matlab.ui.control.Label
        VLabel_6                      matlab.ui.control.Label
        THDPanel                      matlab.ui.container.Panel
        EditField                     matlab.ui.control.NumericEditField
        Label_3                       matlab.ui.control.Label
        CONTROLESButtonGroup          matlab.ui.container.ButtonGroup
        CalcularButton                matlab.ui.control.Button
        LimpiarCamposSwitchLabel      matlab.ui.control.Label
        LimpiarCamposSwitch           matlab.ui.control.Switch
        FundamentalLampLabel          matlab.ui.control.Label
        FundamentalLamp               matlab.ui.control.Lamp
        moLampLabel                   matlab.ui.control.Label
        moLamp                        matlab.ui.control.Lamp
        voLampLabel                   matlab.ui.control.Label
        voLamp                        matlab.ui.control.Lamp
        toLampLabel                   matlab.ui.control.Label
        toLamp                        matlab.ui.control.Lamp
        roLampLabel                   matlab.ui.control.Label
        roLamp                        matlab.ui.control.Lamp
        UIAxes3                       matlab.ui.control.UIAxes
        UIAxes4                       matlab.ui.control.UIAxes
        ResultanteLampLabel           matlab.ui.control.Label
        ResultanteLamp                matlab.ui.control.Lamp
    end
    methods (Access = private)
        % Callback function
        function FundamentalCheckBoxValueChanged(app, event)

        end
        % Callback function
        function TercerarmnicoCheckBoxValueChanged(app, event)

        end
        % Callback function
        function QuintoarmnicoCheckBoxValueChanged(app, event)

        end
        % Callback function
        function SptimoarmnicoCheckBoxValueChanged(app, event)
```

```matlab
        end
        % Callback function
        function OnceavoarmnicoCheckBoxValueChanged(app, event)

        end
        % Callback function: CalcularButton, FundamentalCheckBox,
        % NdeCiclosSpinner, OnceavoarmnicoCheckBox,
        % QuintoarmnicoCheckBox, SptimoarmnicoCheckBox,
        % TercerarmnicoCheckBox
        function CalcularButtonPushed(app, event)
            valueF = app.FundamentalCheckBox.Value;
            if valueF
                app.FundamentalLamp.Color = [1 0 0] ;

            else
                app.FundamentalLamp.Color = [0.94 0.94 0.94] ;
            end

            value3 = app.TercerarmnicoCheckBox.Value;
            if value3
                app.roLamp.Color = [0 1 0] ;
                app.erarmnicoEditField.Enable='on';
            else
                app.roLamp.Color = [0.94 0.94 0.94] ;
                app.erarmnicoEditField.Enable='off';
            end

            value5 = app.QuintoarmnicoCheckBox.Value;
            if value5
                app.toLamp.Color = [0 0 1] ;
                app.toarmnicoEditField.Enable='on';
            else
                app.toLamp.Color = [0.94 0.94 0.94] ;
                app.toarmnicoEditField.Enable='off';
            end

            value7 = app.SptimoarmnicoCheckBox.Value;
            if value7
                app.moLamp.Color = [1 0 1] ;
                app.moarmnicoEditField.Enable='on';
            else
                app.moLamp.Color = [0.94 0.94 0.94] ;
                app.moarmnicoEditField.Enable='off';
            end

            value11 = app.OnceavoarmnicoCheckBox.Value;
            if value11
                app.voLamp.Color = [0 1 1] ;
                app.voarmnicoEditField.Enable='on';
            else
                app.voLamp.Color = [0.94 0.94 0.94] ;
                app.voarmnicoEditField.Enable='off';
            end

            Vm=app.AmplitudEditField.Value;
            f=app.FrecuenciaEditField.Value;

            if (Vm==0 ||f==0)
                message = sprintf('Revise que los campos de amplitud y frecuencia no sean
0.');

uialert(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure,message,'Alerta','Icon','warning');
            else
                Vm3=app.erarmnicoEditField.Value;
                Vm5=app.toarmnicoEditField.Value;
                Vm7=app.moarmnicoEditField.Value;
                Vm11=app.voarmnicoEditField.Value;

                N=app.NdeCiclosSpinner.Value;

                t=linspace(0,(1/60)*N,200);
```

```matlab
            Fm=Vm*sin(2*pi*f*t);
            Fm3=Vm3*sin(2*pi*(f*3)*t);
            Fm5=Vm5*sin(2*pi*(f*5)*t);
            Fm7=Vm7*sin(2*pi*(f*7)*t);
            Fm11=Vm11*sin(2*pi*(f*11)*t);

            Ft=Fm+Fm3+Fm5+Fm7+Fm11;

            thd_t=(sqrt((Vm3^2)+(Vm5^2)+(Vm7^2)+(Vm11^2))/(Vm))*100;

            app.EditField.Value=thd_t;

            x1=[1 3 5 7 11];
            y1=[(Vm/Vm)*100 (Vm3/Vm)*100 (Vm5/Vm)*100 (Vm7/Vm)*100 (Vm11/Vm)*100];

            bar(app.UIAxes4,x1,y1,'FaceColor',[0 .6 .6],'EdgeColor',[0 0.8
0.8],'LineWidth',1.0);

            Once = app.OnceavoarmnicoCheckBox.Value;
            Siete = app.SptimoarmnicoCheckBox.Value;
            Quinto = app.QuintoarmnicoCheckBox.Value;
            Tercer = app.TercerarmnicoCheckBox.Value;
            Fundamental = app.FundamentalCheckBox.Value;

            %app.UIAxes3.LineWidth=1.5;
            %app.UIAxes4.LineWidth=1.5;
            plot(app.UIAxes3,t,Ft,'-y','LineWidth',1.5);

            y=Ft;
            y(2,:)=Fm;
            y(3,:)=Fm3;
            y(4,:)=Fm5;
            y(5,:)=Fm7;
            y(6,:)=Fm11;

            x=plot(app.UIAxes3,t,y,'LineWidth',1.5);

            x(1,:).Color=[1 1 0];


            if Fundamental
                x(2,:).Color=[1 0 0];
            else
                x(2,:).Color=[1 0 0];
                y(2,:)=0;
                x=plot(app.UIAxes3,t,y,'LineWidth',1.5);
                x(1,:).Color=[1 1 0];

                if Fundamental
                    x(2,:).Color=[1 0 0];
                end

                if Tercer
                    x(3,:).Color=[0 1 0];
                end

                if Quinto
                    x(4,:).Color=[0 0 1];
                end

                if Siete
                    x(5,:).Color=[1 0 1];
                end

                if Once
                    x(6,:).Color=[0 1 1];
                end
            end

            if Tercer
                x(3,:).Color=[0 1 0];
```

```matlab
else
    x(3,:).Color=[0 1 0];
    y(3,:)=0;
    x=plot(app.UIAxes3,t,y,'LineWidth',1.5);
    x(1,:).Color=[1 1 0];

    if Fundamental
        x(2,:).Color=[1 0 0];
    end

    if Tercer
        x(3,:).Color=[0 1 0];
    end

    if Quinto
        x(4,:).Color=[0 0 1];
    end

    if Siete
        x(5,:).Color=[1 0 1];
    end

    if Once
        x(6,:).Color=[0 1 1];
    end
end

if Quinto
    x(4,:).Color=[0 0 1];
else
    x(4,:).Color=[0 0 1];
    y(4,:)=0;
    x=plot(app.UIAxes3,t,y,'LineWidth',1.5);
    x(1,:).Color=[1 1 0];

    if Fundamental
        x(2,:).Color=[1 0 0];
    end

    if Tercer
        x(3,:).Color=[0 1 0];
    end

    if Quinto
        x(4,:).Color=[0 0 1];
    end

    if Siete
        x(5,:).Color=[1 0 1];
    end

    if Once
        x(6,:).Color=[0 1 1];
    end
end

if Siete
    x(5,:).Color=[1 0 1];
else
    x(5,:).Color=[1 0 1];
    y(5,:)=0;
    x=plot(app.UIAxes3,t,y,'LineWidth',1.5);
    x(1,:).Color=[1 1 0];

    if Fundamental
        x(2,:).Color=[1 0 0];
    end

    if Tercer
        x(3,:).Color=[0 1 0];
    end
```

```matlab
                    if Quinto
                        x(4,:).Color=[0 0 1];
                    end

                    if Siete
                        x(5,:).Color=[1 0 1];
                    end

                    if Once
                        x(6,:).Color=[0 1 1];
                    end
                end

                if Once
                    x(6,:).Color=[0 1 1];
                else
                    x(6,:).Color=[0 1 1];
                    y(6,:)=0;
                    x=plot(app.UIAxes3,t,y,'LineWidth',1.5);
                    x(1,:).Color=[1 1 0];

                    if Fundamental
                        x(2,:).Color=[1 0 0];
                    end

                    if Tercer
                        x(3,:).Color=[0 1 0];
                    end

                    if Quinto
                        x(4,:).Color=[0 0 1];
                    end

                    if Siete
                        x(5,:).Color=[1 0 1];
                    end

                    if Once
                        x(6,:).Color=[0 1 1];
                    end
                end
%               if(Fundamental==true && Tercer~=true && Quinto~=true && Siete~=true &&
Once~=true)
%                    plot(app.UIAxes3,t,Ft,'-y',t,Fm,'-r','LineWidth',1.5);
%               elseif (Fundamental==true && Tercer==true && Quinto~=true && Siete~=true &&
Once~=true)
%                    plot(app.UIAxes3,t,Ft,'-y',t,Fm,'-r',t,Fm3,'-g','LineWidth',1.5);
%               elseif (Fundamental==true && Tercer==true && Quinto==true && Siete~=true &&
Once~=true)
%                    plot(app.UIAxes3,t,Ft,'-y',t,Fm,'-r',t,Fm3,'-g',t,Fm5,'-
b','LineWidth',1.5);
%               elseif (Fundamental==true && Tercer==true && Quinto==true && Siete==true &&
Once~=true)
%                    plot(app.UIAxes3,t,Ft,'-y',t,Fm,'-r',t,Fm3,'-g',t,Fm5,'-b',t,Fm7,'-
m','LineWidth',1.5);
%               elseif (Fundamental==true && Tercer==true && Quinto==true && Siete==true &&
Once==true)
%                    plot(app.UIAxes3,t,Ft,'-y',t,Fm,'-r',t,Fm3,'-g',t,Fm5,'-b',t,Fm7,'-
m',t,Fm11,'-c','LineWidth',1.5);
%               end

            end
        end
        % Value changed function: LimpiarCamposSwitch
        function LimpiarCamposSwitchValueChanged(app, event)
            value = app.LimpiarCamposSwitch.Value;
            switch value
                case 'On'
                    f = waitbar(0,'Espere un momento por favor...');
                    pause(.1)
                    app.AmplitudEditField.Value=0;
                    app.FrecuenciaEditField.Value=0;
```

```matlab
                        waitbar(.2,f,'Limpiando campos');
                        pause(0.1)
                        app.TercerarmnicoCheckBox.Value=false;
                        app.QuintoarmnicoCheckBox.Value=false;
                        app.SptimoarmnicoCheckBox.Value=false;
                        app.OnceavoarmnicoCheckBox.Value=false;
                        app.FundamentalCheckBox.Value=false;
                        app.NdeCiclosSpinner.Value=1;

                        waitbar(.4,f,'Limpiando campos');
                        pause(0.1)
                        app.erarmnicoEditField.Value=0;
                        app.toarmnicoEditField.Value=0;
                        app.moarmnicoEditField.Value=0;
                        app.voarmnicoEditField.Value=0;

                        waitbar(.6,f,'Limpiando campos');
                        pause(0.05)
                        app.EditField.Value=0;

                        waitbar(.8,f,'Finalizando');
                        pause(0.1)
                        cla(app.UIAxes3)
                        cla(app.UIAxes4)

                        waitbar(1,f,'Finalizando');
                        pause(.05)
                        app.moLamp.Color = [0.94 0.94 0.94] ;
                        app.voLamp.Color = [0.94 0.94 0.94] ;
                        app.toLamp.Color = [0.94 0.94 0.94] ;
                        app.roLamp.Color = [0.94 0.94 0.94] ;
                        app.FundamentalLamp.Color = [0.94 0.94 0.94] ;
                        close(f)

                        app.LimpiarCamposSwitch.Value = 'Off';

                end
            end
        % Close request function:
        % ProgramacinAvanzadaDiegoVillegasGoveaUIFigure
        function ProgramacinAvanzadaDiegoVillegasGoveaUIFigureCloseRequest(app, event)
                selection = uiconfirm(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure,'¿Deseas
cerrar la aplicación?','Confirmación de cerrar','Icon','question');

%uialert(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure,selection,'Alerta','Icon','warning
');

                if (strcmp(selection,'Cancel'))
                else
                    delete(app)
                end
            end
        end
    end
    % App initialization and construction
    methods (Access = private)
        % Create UIFigure and components
        function createComponents(app)
            % Create ProgramacinAvanzadaDiegoVillegasGoveaUIFigure
            app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure = uifigure;
            app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure.Color = [0.9412 0.9412 0.9412];
            app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure.Position = [50 50 1200 650];
            app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure.Name = 'Programación Avanzada -
Diego Villegas Govea';
            app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure.CloseRequestFcn =
createCallbackFcn(app, @ProgramacinAvanzadaDiegoVillegasGoveaUIFigureCloseRequest, true);
            % Create MedidordeArmnicosLabel
            app.MedidordeArmnicosLabel =
uilabel(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure);
            app.MedidordeArmnicosLabel.BackgroundColor = [0 0.451 0.7412];
            app.MedidordeArmnicosLabel.HorizontalAlignment = 'center';
```

```matlab
            app.MedidordeArmnicosLabel.VerticalAlignment = 'center';
            app.MedidordeArmnicosLabel.FontName = 'Berlin Sans FB';
            app.MedidordeArmnicosLabel.FontSize = 24;
            app.MedidordeArmnicosLabel.FontColor = [0.9412 0.9412 0.9412];
            app.MedidordeArmnicosLabel.Position = [1 614 1200 37];
            app.MedidordeArmnicosLabel.Text = 'Medidor de Armónicos';
            % Create Label
            app.Label = uilabel(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure);
            app.Label.BackgroundColor = [0 0.451 0.7412];
            app.Label.HorizontalAlignment = 'center';
            app.Label.VerticalAlignment = 'center';
            app.Label.FontName = 'Berlin Sans FB';
            app.Label.FontSize = 10;
            app.Label.FontColor = [0.9412 0.9412 0.9412];
            app.Label.Position = [1 246 1200 10];
            app.Label.Text = '';
            % Create Panel
            app.Panel = uipanel(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure);
            app.Panel.BackgroundColor = [1 1 1];
            app.Panel.Position = [1 1 1200 246];
            % Create InyeccindeArmnicosPanel
            app.InyeccindeArmnicosPanel = uipanel(app.Panel);
            app.InyeccindeArmnicosPanel.ForegroundColor = [0 0.451 0.7412];
            app.InyeccindeArmnicosPanel.TitlePosition = 'centertop';
            app.InyeccindeArmnicosPanel.Title = 'Inyección de Armónicos';
            app.InyeccindeArmnicosPanel.BackgroundColor = [0.9608 0.9608 0.9804];
            app.InyeccindeArmnicosPanel.FontName = 'Berlin Sans FB';
            app.InyeccindeArmnicosPanel.FontSize = 18;
            app.InyeccindeArmnicosPanel.Position = [296 15 186 221];
            % Create TercerarmnicoCheckBox
            app.TercerarmnicoCheckBox = uicheckbox(app.InyeccindeArmnicosPanel);
            app.TercerarmnicoCheckBox.ValueChangedFcn = createCallbackFcn(app,
@CalcularButtonPushed, true);
            app.TercerarmnicoCheckBox.Text = 'Tercer armónico.';
            app.TercerarmnicoCheckBox.FontName = 'Berlin Sans FB';
            app.TercerarmnicoCheckBox.FontSize = 14;
            app.TercerarmnicoCheckBox.FontColor = [0.149 0.149 0.149];
            app.TercerarmnicoCheckBox.Position = [21 134 119 18];
            app.TercerarmnicoCheckBox.Value = true;
            % Create QuintoarmnicoCheckBox
            app.QuintoarmnicoCheckBox = uicheckbox(app.InyeccindeArmnicosPanel);
            app.QuintoarmnicoCheckBox.ValueChangedFcn = createCallbackFcn(app,
@CalcularButtonPushed, true);
            app.QuintoarmnicoCheckBox.Text = 'Quinto armónico.';
            app.QuintoarmnicoCheckBox.FontName = 'Berlin Sans FB';
            app.QuintoarmnicoCheckBox.FontSize = 14;
            app.QuintoarmnicoCheckBox.FontColor = [0.149 0.149 0.149];
            app.QuintoarmnicoCheckBox.Position = [21 105 123 18];
            app.QuintoarmnicoCheckBox.Value = true;
            % Create SptimoarmnicoCheckBox
            app.SptimoarmnicoCheckBox = uicheckbox(app.InyeccindeArmnicosPanel);
            app.SptimoarmnicoCheckBox.ValueChangedFcn = createCallbackFcn(app,
@CalcularButtonPushed, true);
            app.SptimoarmnicoCheckBox.Text = 'Séptimo armónico.';
            app.SptimoarmnicoCheckBox.FontName = 'Berlin Sans FB';
            app.SptimoarmnicoCheckBox.FontSize = 14;
            app.SptimoarmnicoCheckBox.FontColor = [0.149 0.149 0.149];
            app.SptimoarmnicoCheckBox.Position = [21 76 131 18];
            app.SptimoarmnicoCheckBox.Value = true;
            % Create OnceavoarmnicoCheckBox
            app.OnceavoarmnicoCheckBox = uicheckbox(app.InyeccindeArmnicosPanel);
            app.OnceavoarmnicoCheckBox.ValueChangedFcn = createCallbackFcn(app,
@CalcularButtonPushed, true);
            app.OnceavoarmnicoCheckBox.Text = 'Onceavo armónico.';
            app.OnceavoarmnicoCheckBox.FontName = 'Berlin Sans FB';
            app.OnceavoarmnicoCheckBox.FontSize = 14;
            app.OnceavoarmnicoCheckBox.FontColor = [0.149 0.149 0.149];
            app.OnceavoarmnicoCheckBox.Position = [21 48 135 18];
            app.OnceavoarmnicoCheckBox.Value = true;
            % Create FundamentalCheckBox
            app.FundamentalCheckBox = uicheckbox(app.InyeccindeArmnicosPanel);
```

```matlab
            app.FundamentalCheckBox.ValueChangedFcn = createCallbackFcn(app,
@CalcularButtonPushed, true);
            app.FundamentalCheckBox.Text = 'Fundamental';
            app.FundamentalCheckBox.FontName = 'Berlin Sans FB';
            app.FundamentalCheckBox.FontSize = 14;
            app.FundamentalCheckBox.FontColor = [0.149 0.149 0.149];
            app.FundamentalCheckBox.Position = [21 166 132 18];
            app.FundamentalCheckBox.Value = true;
            % Create NdeCiclosSpinnerLabel
            app.NdeCiclosSpinnerLabel = uilabel(app.InyeccindeArmnicosPanel);
            app.NdeCiclosSpinnerLabel.HorizontalAlignment = 'right';
            app.NdeCiclosSpinnerLabel.FontName = 'Berlin Sans FB';
            app.NdeCiclosSpinnerLabel.FontSize = 14;
            app.NdeCiclosSpinnerLabel.Position = [10 16 74 18];
            app.NdeCiclosSpinnerLabel.Text = 'Nº de Ciclos';
            % Create NdeCiclosSpinner
            app.NdeCiclosSpinner = uispinner(app.InyeccindeArmnicosPanel);
            app.NdeCiclosSpinner.Limits = [1 Inf];
            app.NdeCiclosSpinner.RoundFractionalValues = 'on';
            app.NdeCiclosSpinner.ValueChangedFcn = createCallbackFcn(app,
@CalcularButtonPushed, true);
            app.NdeCiclosSpinner.HorizontalAlignment = 'center';
            app.NdeCiclosSpinner.FontName = 'Berlin Sans FB';
            app.NdeCiclosSpinner.FontSize = 14;
            app.NdeCiclosSpinner.Position = [87 14 80 22];
            app.NdeCiclosSpinner.Value = 1;
            % Create FundamentalPanel
            app.FundamentalPanel = uipanel(app.Panel);
            app.FundamentalPanel.ForegroundColor = [0 0.451 0.7412];
            app.FundamentalPanel.TitlePosition = 'centertop';
            app.FundamentalPanel.Title = 'Fundamental';
            app.FundamentalPanel.BackgroundColor = [0.9608 0.9608 0.9804];
            app.FundamentalPanel.FontName = 'Berlin Sans FB';
            app.FundamentalPanel.FontSize = 18;
            app.FundamentalPanel.Position = [45 62 233 122];
            % Create AmplitudEditFieldLabel
            app.AmplitudEditFieldLabel = uilabel(app.FundamentalPanel);
            app.AmplitudEditFieldLabel.HorizontalAlignment = 'right';
            app.AmplitudEditFieldLabel.FontName = 'Berlin Sans FB';
            app.AmplitudEditFieldLabel.FontSize = 14;
            app.AmplitudEditFieldLabel.Position = [24 62 61 18];
            app.AmplitudEditFieldLabel.Text = 'Amplitud';
            % Create AmplitudEditField
            app.AmplitudEditField = uieditfield(app.FundamentalPanel, 'numeric');
            app.AmplitudEditField.HorizontalAlignment = 'center';
            app.AmplitudEditField.FontName = 'Berlin Sans FB';
            app.AmplitudEditField.FontSize = 14;
            app.AmplitudEditField.Position = [100 61 100 22];
            % Create FrecuenciaEditFieldLabel
            app.FrecuenciaEditFieldLabel = uilabel(app.FundamentalPanel);
            app.FrecuenciaEditFieldLabel.HorizontalAlignment = 'right';
            app.FrecuenciaEditFieldLabel.FontName = 'Berlin Sans FB';
            app.FrecuenciaEditFieldLabel.FontSize = 14;
            app.FrecuenciaEditFieldLabel.Position = [17 26 68 18];
            app.FrecuenciaEditFieldLabel.Text = 'Frecuencia';
            % Create FrecuenciaEditField
            app.FrecuenciaEditField = uieditfield(app.FundamentalPanel, 'numeric');
            app.FrecuenciaEditField.HorizontalAlignment = 'center';
            app.FrecuenciaEditField.FontName = 'Berlin Sans FB';
            app.FrecuenciaEditField.FontSize = 14;
            app.FrecuenciaEditField.Position = [100 25 100 22];
            % Create VLabel_2
            app.VLabel_2 = uilabel(app.FundamentalPanel);
            app.VLabel_2.HorizontalAlignment = 'center';
            app.VLabel_2.FontName = 'Berlin Sans FB';
            app.VLabel_2.FontWeight = 'bold';
            app.VLabel_2.Position = [201 65 25 15];
            app.VLabel_2.Text = 'V';
            % Create HzLabel_6
            app.HzLabel_6 = uilabel(app.FundamentalPanel);
            app.HzLabel_6.HorizontalAlignment = 'center';
            app.HzLabel_6.FontName = 'Berlin Sans FB';
```

```matlab
app.HzLabel_6.FontWeight = 'bold';
app.HzLabel_6.Position = [201 29 25 15];
app.HzLabel_6.Text = 'Hz';
% Create AmplituddelosArmnicosPanel
app.AmplituddelosArmnicosPanel = uipanel(app.Panel);
app.AmplituddelosArmnicosPanel.ForegroundColor = [0 0.451 0.7412];
app.AmplituddelosArmnicosPanel.TitlePosition = 'centertop';
app.AmplituddelosArmnicosPanel.Title = 'Amplitud de los Armónicos';
app.AmplituddelosArmnicosPanel.BackgroundColor = [0.9608 0.9608 0.9804];
app.AmplituddelosArmnicosPanel.FontName = 'Berlin Sans FB';
app.AmplituddelosArmnicosPanel.FontSize = 18;
app.AmplituddelosArmnicosPanel.Position = [501 29 299 170];
% Create erarmnicoEditFieldLabel
app.erarmnicoEditFieldLabel = uilabel(app.AmplituddelosArmnicosPanel);
app.erarmnicoEditFieldLabel.HorizontalAlignment = 'right';
app.erarmnicoEditFieldLabel.FontName = 'Berlin Sans FB';
app.erarmnicoEditFieldLabel.FontSize = 14;
app.erarmnicoEditFieldLabel.Position = [15 109 82 18];
app.erarmnicoEditFieldLabel.Text = '3er armónico';
% Create erarmnicoEditField
app.erarmnicoEditField = uieditfield(app.AmplituddelosArmnicosPanel, 'numeric');
app.erarmnicoEditField.HorizontalAlignment = 'center';
app.erarmnicoEditField.FontName = 'Berlin Sans FB';
app.erarmnicoEditField.FontSize = 14;
app.erarmnicoEditField.Position = [112 108 150 22];
% Create toarmnicoEditFieldLabel
app.toarmnicoEditFieldLabel = uilabel(app.AmplituddelosArmnicosPanel);
app.toarmnicoEditFieldLabel.HorizontalAlignment = 'right';
app.toarmnicoEditFieldLabel.FontName = 'Berlin Sans FB';
app.toarmnicoEditFieldLabel.FontSize = 14;
app.toarmnicoEditFieldLabel.Position = [15 76 82 18];
app.toarmnicoEditFieldLabel.Text = '5to armónico';
% Create toarmnicoEditField
app.toarmnicoEditField = uieditfield(app.AmplituddelosArmnicosPanel, 'numeric');
app.toarmnicoEditField.HorizontalAlignment = 'center';
app.toarmnicoEditField.FontName = 'Berlin Sans FB';
app.toarmnicoEditField.FontSize = 14;
app.toarmnicoEditField.Position = [112 75 150 22];
% Create moarmnicoEditFieldLabel
app.moarmnicoEditFieldLabel = uilabel(app.AmplituddelosArmnicosPanel);
app.moarmnicoEditFieldLabel.HorizontalAlignment = 'right';
app.moarmnicoEditFieldLabel.FontName = 'Berlin Sans FB';
app.moarmnicoEditFieldLabel.FontSize = 14;
app.moarmnicoEditFieldLabel.Position = [8 46 89 18];
app.moarmnicoEditFieldLabel.Text = '7mo armónico';
% Create moarmnicoEditField
app.moarmnicoEditField = uieditfield(app.AmplituddelosArmnicosPanel, 'numeric');
app.moarmnicoEditField.HorizontalAlignment = 'center';
app.moarmnicoEditField.FontName = 'Berlin Sans FB';
app.moarmnicoEditField.FontSize = 14;
app.moarmnicoEditField.Position = [112 45 150 22];
% Create voarmnicoEditFieldLabel
app.voarmnicoEditFieldLabel = uilabel(app.AmplituddelosArmnicosPanel);
app.voarmnicoEditFieldLabel.HorizontalAlignment = 'right';
app.voarmnicoEditFieldLabel.FontName = 'Berlin Sans FB';
app.voarmnicoEditFieldLabel.FontSize = 14;
app.voarmnicoEditFieldLabel.Position = [11 14 86 18];
app.voarmnicoEditFieldLabel.Text = '11vo armónico';
% Create voarmnicoEditField
app.voarmnicoEditField = uieditfield(app.AmplituddelosArmnicosPanel, 'numeric');
app.voarmnicoEditField.HorizontalAlignment = 'center';
app.voarmnicoEditField.FontName = 'Berlin Sans FB';
app.voarmnicoEditField.FontSize = 14;
app.voarmnicoEditField.Position = [112 13 150 22];
% Create VLabel_3
app.VLabel_3 = uilabel(app.AmplituddelosArmnicosPanel);
app.VLabel_3.HorizontalAlignment = 'center';
app.VLabel_3.FontName = 'Berlin Sans FB';
app.VLabel_3.FontWeight = 'bold';
app.VLabel_3.Position = [261 111 25 15];
app.VLabel_3.Text = 'V';
% Create VLabel_4
```

```matlab
            app.VLabel_4 = uilabel(app.AmplituddelosArmnicosPanel);
            app.VLabel_4.HorizontalAlignment = 'center';
            app.VLabel_4.FontName = 'Berlin Sans FB';
            app.VLabel_4.FontWeight = 'bold';
            app.VLabel_4.Position = [261 78 25 15];
            app.VLabel_4.Text = 'V';
            % Create VLabel_5
            app.VLabel_5 = uilabel(app.AmplituddelosArmnicosPanel);
            app.VLabel_5.HorizontalAlignment = 'center';
            app.VLabel_5.FontName = 'Berlin Sans FB';
            app.VLabel_5.FontWeight = 'bold';
            app.VLabel_5.Position = [261 49 25 15];
            app.VLabel_5.Text = 'V';
            % Create VLabel_6
            app.VLabel_6 = uilabel(app.AmplituddelosArmnicosPanel);
            app.VLabel_6.HorizontalAlignment = 'center';
            app.VLabel_6.FontName = 'Berlin Sans FB';
            app.VLabel_6.FontWeight = 'bold';
            app.VLabel_6.Position = [261 16 25 15];
            app.VLabel_6.Text = 'V';
            % Create THDPanel
            app.THDPanel = uipanel(app.Panel);
            app.THDPanel.ForegroundColor = [0 0.451 0.7412];
            app.THDPanel.TitlePosition = 'centertop';
            app.THDPanel.Title = 'THD';
            app.THDPanel.BackgroundColor = [0.9608 0.9608 0.9804];
            app.THDPanel.FontName = 'Berlin Sans FB';
            app.THDPanel.FontSize = 18;
            app.THDPanel.Position = [819 84 199 83];
            % Create EditField
            app.EditField = uieditfield(app.THDPanel, 'numeric');
            app.EditField.Editable = 'off';
            app.EditField.HorizontalAlignment = 'center';
            app.EditField.FontName = 'Berlin Sans FB';
            app.EditField.FontSize = 14;
            app.EditField.Position = [38 19 123 22];
            % Create Label_3
            app.Label_3 = uilabel(app.THDPanel);
            app.Label_3.HorizontalAlignment = 'center';
            app.Label_3.FontName = 'Berlin Sans FB';
            app.Label_3.FontSize = 16;
            app.Label_3.Position = [160 20 25 21];
            app.Label_3.Text = '%';
            % Create CONTROLESButtonGroup
            app.CONTROLESButtonGroup = uibuttongroup(app.Panel);
            app.CONTROLESButtonGroup.ForegroundColor = [1 0.102 0.102];
            app.CONTROLESButtonGroup.TitlePosition = 'centertop';
            app.CONTROLESButtonGroup.Title = 'CONTROLES';
            app.CONTROLESButtonGroup.FontWeight = 'bold';
            app.CONTROLESButtonGroup.FontSize = 14;
            app.CONTROLESButtonGroup.Position = [1041 36 138 175];
            % Create CalcularButton
            app.CalcularButton = uibutton(app.CONTROLESButtonGroup, 'push');
            app.CalcularButton.ButtonPushedFcn = createCallbackFcn(app,
@CalcularButtonPushed, true);
            app.CalcularButton.FontName = 'Century Gothic';
            app.CalcularButton.FontSize = 14;
            app.CalcularButton.FontWeight = 'bold';
            app.CalcularButton.Position = [19 94 100 26];
            app.CalcularButton.Text = 'Calcular';
            % Create LimpiarCamposSwitchLabel
            app.LimpiarCamposSwitchLabel = uilabel(app.CONTROLESButtonGroup);
            app.LimpiarCamposSwitchLabel.HorizontalAlignment = 'center';
            app.LimpiarCamposSwitchLabel.FontName = 'Century Gothic';
            app.LimpiarCamposSwitchLabel.FontWeight = 'bold';
            app.LimpiarCamposSwitchLabel.FontColor = [0.149 0.149 0.149];
            app.LimpiarCamposSwitchLabel.Position = [23 14 100 15];
            app.LimpiarCamposSwitchLabel.Text = 'Limpiar Campos';
            % Create LimpiarCamposSwitch
            app.LimpiarCamposSwitch = uiswitch(app.CONTROLESButtonGroup, 'slider');
            app.LimpiarCamposSwitch.ValueChangedFcn = createCallbackFcn(app,
@LimpiarCamposSwitchValueChanged, true);
```

```matlab
            app.LimpiarCamposSwitch.FontName = 'Century Gothic';
            app.LimpiarCamposSwitch.Position = [47 44 45 20];
            % Create FundamentalLampLabel
            app.FundamentalLampLabel =
uilabel(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure);
            app.FundamentalLampLabel.HorizontalAlignment = 'right';
            app.FundamentalLampLabel.FontName = 'Berlin Sans FB';
            app.FundamentalLampLabel.Position = [1113 357 74 15];
            app.FundamentalLampLabel.Text = 'Fundamental';
            % Create FundamentalLamp
            app.FundamentalLamp = uilamp(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure);
            app.FundamentalLamp.Position = [1097 354 20 20];
            app.FundamentalLamp.Color = [1 0 0];
            % Create moLampLabel
            app.moLampLabel = uilabel(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure);
            app.moLampLabel.FontName = 'Berlin Sans FB';
            app.moLampLabel.Position = [1127 448 60 15];
            app.moLampLabel.Text = '7mo';
            % Create moLamp
            app.moLamp = uilamp(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure);
            app.moLamp.Position = [1097 445 20 20];
            app.moLamp.Color = [1 0 1];
            % Create voLampLabel
            app.voLampLabel = uilabel(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure);
            app.voLampLabel.FontName = 'Berlin Sans FB';
            app.voLampLabel.Position = [1127 420 60 15];
            app.voLampLabel.Text = '11vo';
            % Create voLamp
            app.voLamp = uilamp(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure);
            app.voLamp.Position = [1097 417 20 20];
            app.voLamp.Color = [0 1 1];
            % Create toLampLabel
            app.toLampLabel = uilabel(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure);
            app.toLampLabel.FontName = 'Berlin Sans FB';
            app.toLampLabel.Position = [1124 513 60 15];
            app.toLampLabel.Text = '5to';
            % Create toLamp
            app.toLamp = uilamp(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure);
            app.toLamp.Position = [1094 510 20 20];
            app.toLamp.Color = [0 0.451 0.7412];
            % Create roLampLabel
            app.roLampLabel = uilabel(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure);
            app.roLampLabel.FontName = 'Berlin Sans FB';
            app.roLampLabel.Position = [1124 543 60 15];
            app.roLampLabel.Text = '3ro';
            % Create roLamp
            app.roLamp = uilamp(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure);
            app.roLamp.Position = [1094 540 20 20];
            % Create UIAxes3
            app.UIAxes3 = uiaxes(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure);
            title(app.UIAxes3, 'Composición de Armónicos')
            xlabel(app.UIAxes3, 'Tiempo (seg)')
            ylabel(app.UIAxes3, 'Amplitud (V)')
            app.UIAxes3.FontName = 'Berlin Sans FB';
            app.UIAxes3.FontSize = 14;
            app.UIAxes3.Box = 'on';
            app.UIAxes3.XGrid = 'on';
            app.UIAxes3.YGrid = 'on';
            app.UIAxes3.Position = [576 261 514 348];
            % Create UIAxes4
            app.UIAxes4 = uiaxes(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure);
            title(app.UIAxes4, 'Distorsión Armonica Total')
            xlabel(app.UIAxes4, 'Orden del Armónico')
            ylabel(app.UIAxes4, 'Magnitud en % de la Fundamental')
            app.UIAxes4.FontName = 'Berlin Sans FB';
            app.UIAxes4.FontSize = 14;
            app.UIAxes4.YGrid = 'on';
            app.UIAxes4.Position = [46 261 500 348];
            % Create ResultanteLampLabel
            app.ResultanteLampLabel =
uilabel(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure);
            app.ResultanteLampLabel.FontName = 'Berlin Sans FB';
```

```matlab
            app.ResultanteLampLabel.Position = [1127 329 60 15];
            app.ResultanteLampLabel.Text = 'Resultante';
            % Create ResultanteLamp
            app.ResultanteLamp = uilamp(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure);
            app.ResultanteLamp.Position = [1097 326 20 20];
            app.ResultanteLamp.Color = [1 1 0];
        end
    end
    methods (Access = public)
        % Construct app
        function app = MedidorArmonicos
            % Create and configure components
            createComponents(app)
            % Register the app with App Designer
            registerApp(app, app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure)
            if nargout == 0
                clear app
            end
        end
        % Code that executes before app deletion
        function delete(app)
            % Delete UIFigure when app is deleted
            delete(app.ProgramacinAvanzadaDiegoVillegasGoveaUIFigure)
        end
    end
end
```