Lab #3: Web Application with Genie

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***Abstract* — Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do..**

I. Exercise

In this lab, We will create a basic web application using **Genie** framework in Julia. The application will allow us to control the behaviour of a sine wave, given some adjustble parameters. We are required to carry out this lab using the REPL as in Figure 1.

Figure 1: Julia REPL

Exo 1: Sine Wave Control

We provide the Julia and HTML codes to build and run a web app that allows us to control the amplitude and frequency of a sine wave. **Plotly** is used to plot the corresponding graph. We also added a slider to change the number of samples used to draw the figure. The latter setting permits to grasp the influence of sampling frequency on the look of our chart.

```
using GenieFramework
@genietools

@app begin

    @in N::Int32 = 1000
    @in amp::Float32 = 0.25
    @in freq::Int32 = 1
    @in Pha::Float32 = 1
    @in Ofs::Float32 = 1

    @out my_sine = PlotData()

    @onchange N, amp, freq, Pha, Ofs begin
        x = range(0, 1, length=N)
        y = amp*sin.(2*π*freq*x .+Pha) .+Ofs

        my_sine = PlotData(x=x,
                           y=y,

plot=StipplePlotly.Charts.PLOT_TYPE_LINE)
    end

end

@page("/", "app.jl.html")
```

```
<header class="st-header q-pa-sm">
    <h1 class="st-header__title text-h3" Sinewave
Dashboard </h1>
</header>

<div class="row">
    <div class="st-col col-12 col-sm st-module">
        <p><b># Samples</b></p>
        <q-slider v-model="N"
    :min="10" :max="1000"
    :step="10" :label="true">
  </q-slider>
    </div>

    <div class="st-col col-12 col-sm st-module">
        <p><b>Amplitude</b></p>
        <q-slider v-model="amp"
    :min="0" :max="3"
    :step=".5" :label="true">
  </q-slider>
    </div>

    <div class="st-col col-12 col-sm st-module">
        <p><b>Frequency</b></p>
  <q-slider v-model="freq"
    :min="0" :max="10"
```

```
    :step="1" :label="true">
  </q-slider>
    </div>

    <div class="st-col col-12 col-sm st-module">
        <p><b>Phase</b></p>
  <q-slider v-model="Pha"
    :min="-3.14" :max="3.14"
    :step="0.0314" :label="true">
  </q-slider>
    </div>

    <div class="st-col col-12 col-sm st-module">
        <p><b>Offset</b></p>
  <q-slider v-model="Ofs"
    :min="-0.5" :max="1"
    :step="0.1" :label="true">
  </q-slider>
    </div>
</div>

<div class="row">
    <div class="st-col col-12 col-sm st-module">
  <p><b>Sinewave</b></p>
        <plotly :data="my_sine"> </plotly>
    </div>
<div>
```

```
julia --project
```

```
julia> using GenieFramework
julia> Genie.loadapp() # Load app
julia> up() # Start server
```

We can now open the browser and navigate to the link localhost:8000. We will get the graphical interface as in .

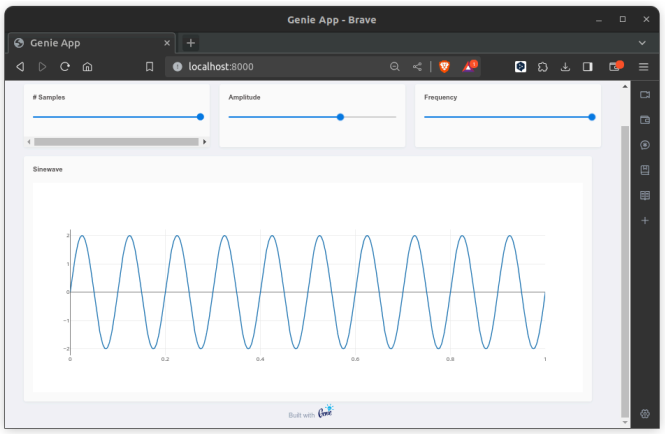

Figure 2: Genie -> Sine Wave

We add Phase and Offset in app.jl.HTML:

```
30      <div class="st-col col-12 col-sm st-module">
31          <p><b>Phase</b></p>
32      <q-slider v-model="pha"
33          :min="-3.14" :max="3.14"
34          :step="0.0314" :label="true">
35      </q-slider>
36      </div>
```

Figure 3: Adding Phase

```
38      <div class="st-col col-12 col-sm st-module">
39          <p><b>Offset</b></p>
40      <q-slider v-model="Ofs"
41          :min="-0.5" :max="1"
42          :step="0.1" :label="true">
43      </q-slider>
44      </div>
45  </div>
```

Figure 4: Adding Offset

Now We add phase and Offset in app.jl

```
4   @app begin
5
6       @in N::Int32 = 1000
7       @in amp::Float32 = 0.25
8       @in freq::Int32 = 1
9       @in pha::Float32 = 1
10      @in ofs::Float32 = 1
11
12      @out my_sine = PlotData()
13
14      @onchange N, amp, freq, pha begin
15          x = range(0, 1, length=N)
16          y = amp*sin.(2*π*freq*x .+pha) .+Ofs
```

Figure 5: app.jl

We can now open the browser and navigate to the link localhost:8000

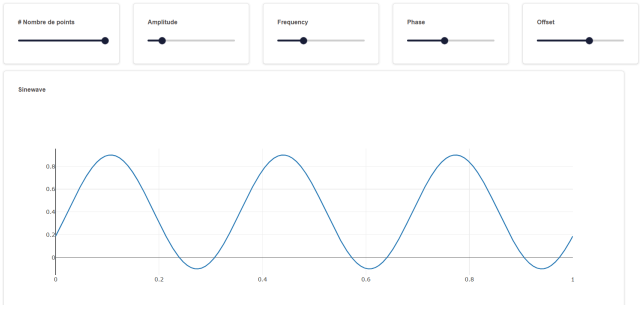

Figure 6: Genie -> Sine Wave