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B20CS033

Data Visualization

Lab 8: Interactive Visualization with Shiny

Problem Statement :

Create the following graphics for the attached data set.

1. Histograms of all the features (where ever possible)
2. Scatter plot of data points with each class output in different color
3. Violin or Box plot for separate class in a single plot

In this graphics add the following interactivity:

1. User can change the bin size of all the histogram separately
2. User can change colors of each histogram separately
3. User can choose the x-axis and y-axis for the scatter plot
4. User can change colors of different class in scatter plot
5. User can filter only certain class for the scatter plot
6. User can change the point size and shape for different classes in the scatter plot
7. (bonus points) Add Pan and Zoom to each diagram.
8. (bonus points) Add resizing of diagram

Data File : `./new-thyroid.data`

```
class,T3-resin uptake test,Total Serum thyroxin,Total serum triiodothyronine,Basal TSH,Maximal absolute difference of TSH value
1,107,10.1,2.2,0.9,2.7
1,113,9.9,3.1,2.0,5.9
1,127,12.9,2.4,1.4,0.6
1,109,5.3,1.6,1.4,1.5
1,105,7.3,1.5,1.5,-0.1
1,105,6.1,2.1,1.4,7.0
1,110,10.4,1.6,1.6,2.7
1,114,9.9,2.4,1.5,5.7
1,106,9.4,2.2,1.5,0.0
1,107,13.0,1.1,0.9,3.1
1,106,4.2,1.2,1.6,1.4
```

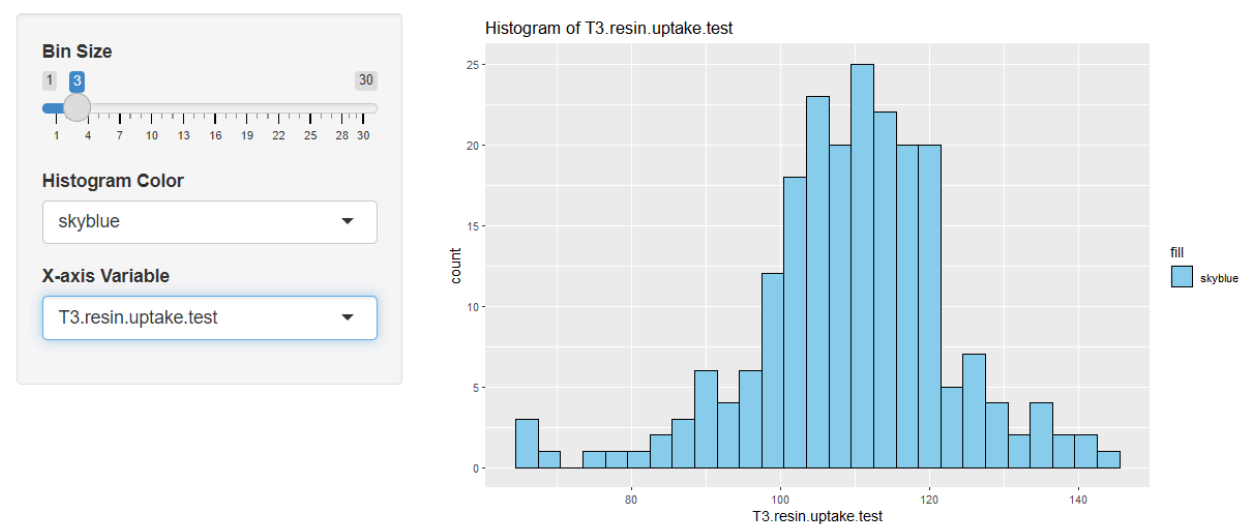
We will make 3 different files for the tasks aligned.

1. histogram.R :

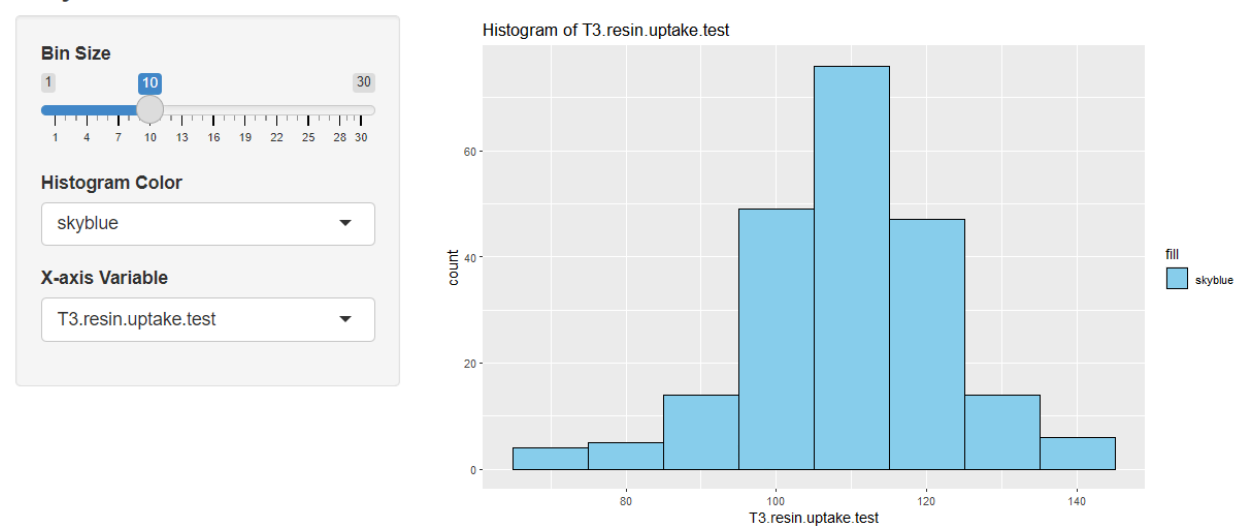
All histogram visualizations with interactivity :

- Bin size variation

Thyroid Data Visualization

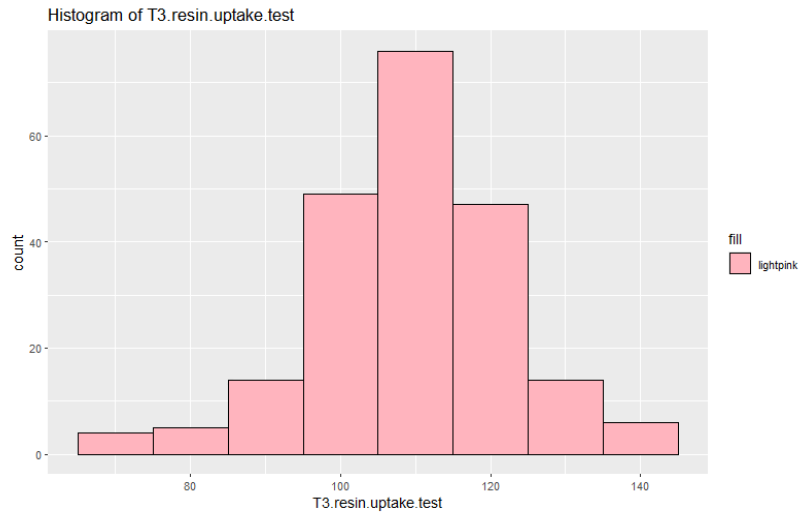
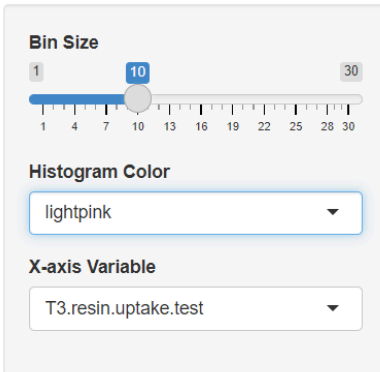


Thyroid Data Visualization

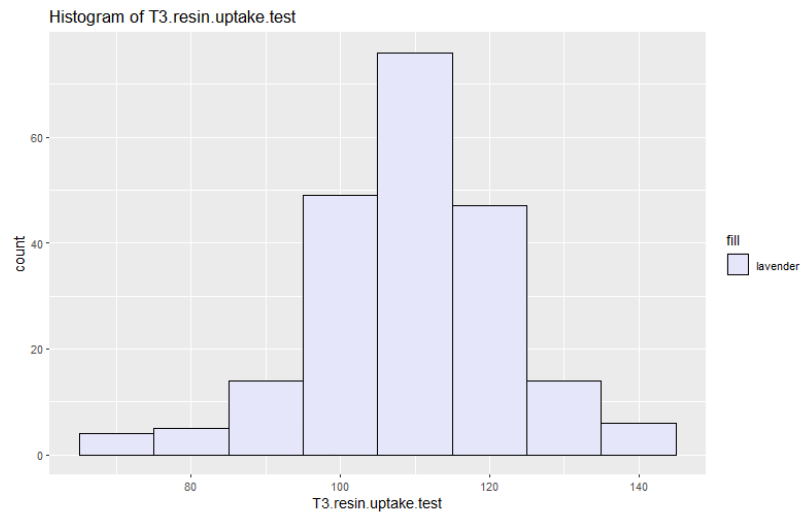
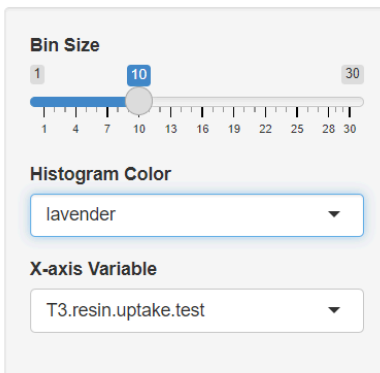


- Histogram color selection

Thyroid Data Visualization

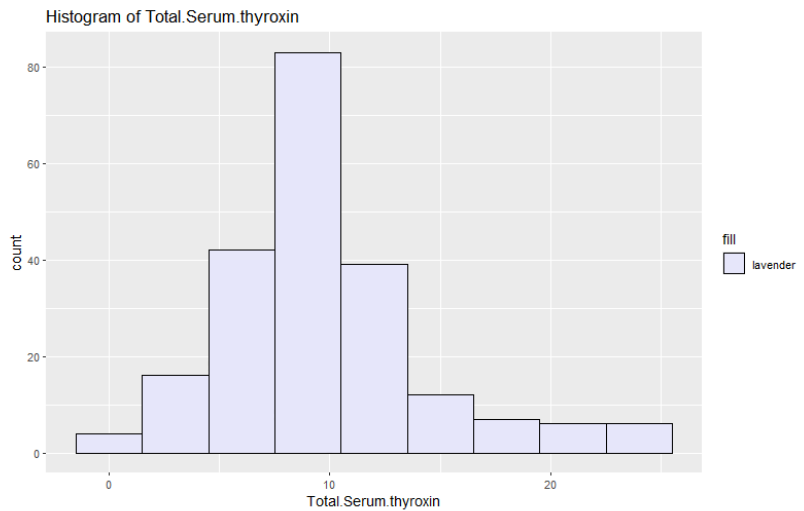
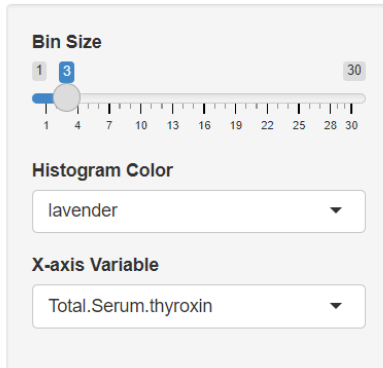


Thyroid Data Visualization

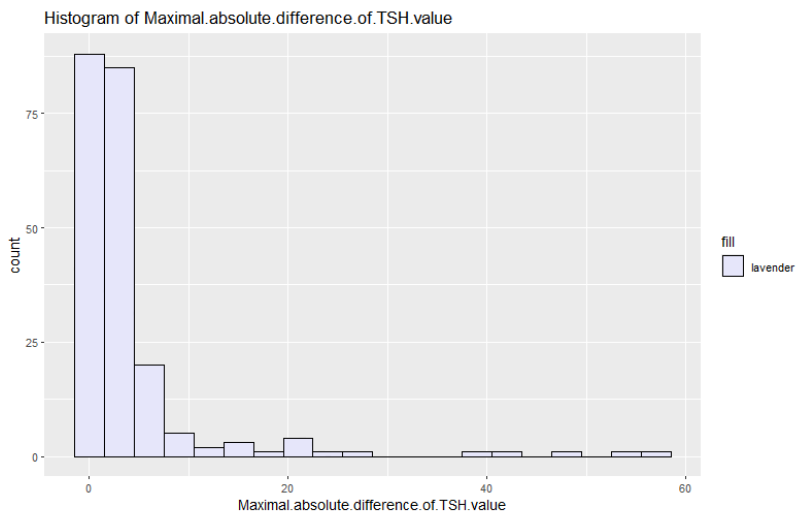
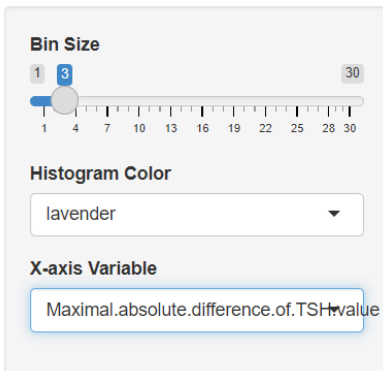


- X-axis feature selection

Thyroid Data Visualization



Thyroid Data Visualization



2. scatter.R : (with Pan and Zoom, resizing options)

All scatter plot visualizations with interactivity :

- User can choose the x-axis and y-axis for the scatter plot

X-axis attribute:

Total.Serum.thyroxin

T3.resin.uptake.test

Total.Serum.thyroxin

Total.serum.triiodothyronine

Basal.TSH

Maximal.absolute.difference.of.TSH.value

☒ Hyner

Y-axis attribute:

T3.resin.uptake.test

T3.resin.uptake.test

Total.Serum.thyroxin

Total.serum.triiodothyronine

Basal.TSH

Maximal.absolute.difference.of.TSH.value

Thyroid Data Visualization

X-axis attribute:
Total.Serum.thyroxin

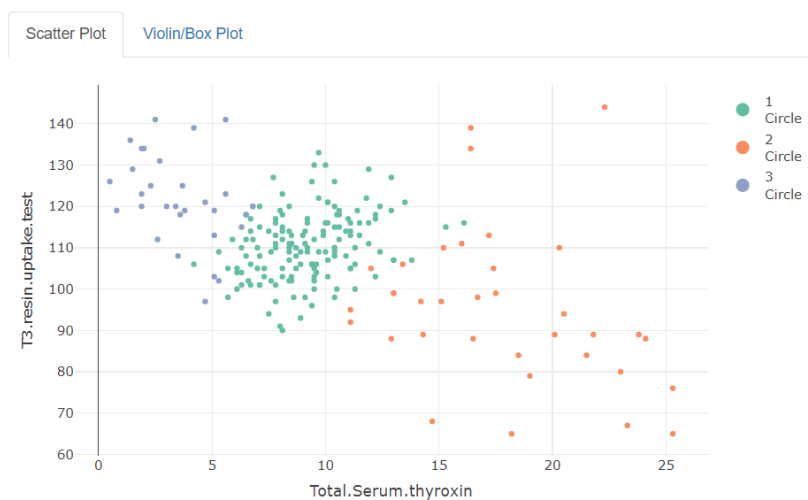
Y-axis attribute:
T3.resin.uptake.test

Select classes to show:
☒ Normal
☒ Hyper
☒ Hypo

Normal color:
Light Green

Hyper color:
Orange

Hypo color:
Grey



Thyroid Data Visualization

X-axis attribute:
T3.resin.uptake.test

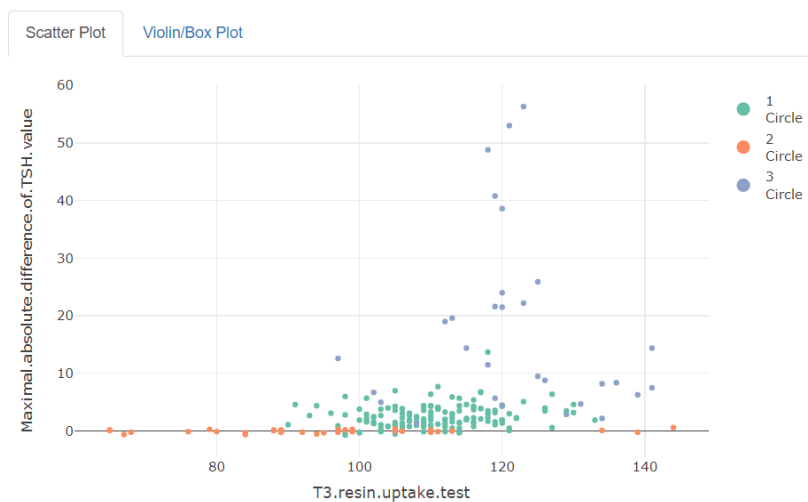
Y-axis attribute:
Maximal.absolute.difference.of.TSH.value

Select classes to show:
☒ Normal
☒ Hyper
☒ Hypo

Normal color:
Light Green

Hyper color:
Orange

Hypo color:
Grey



- User can change colors of different class in scatter plot

Normal color:

Purple ▼

Hyper color:

Green ▼

Hypo color:

Orange ▼

Normal color:

Purple ▲

Red

Blue

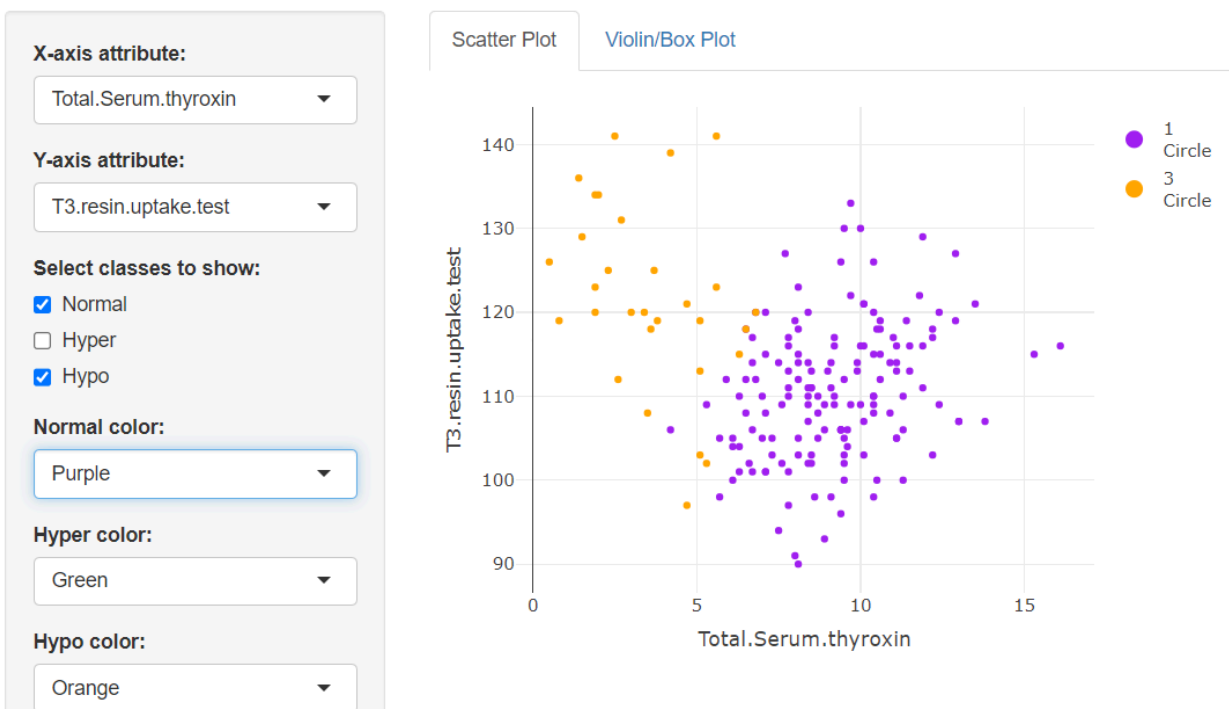
Green

Orange

Purple

Yellow

Thyroid Data Visualization



- User can filter only certain class for the scatter plot

Select classes to show:

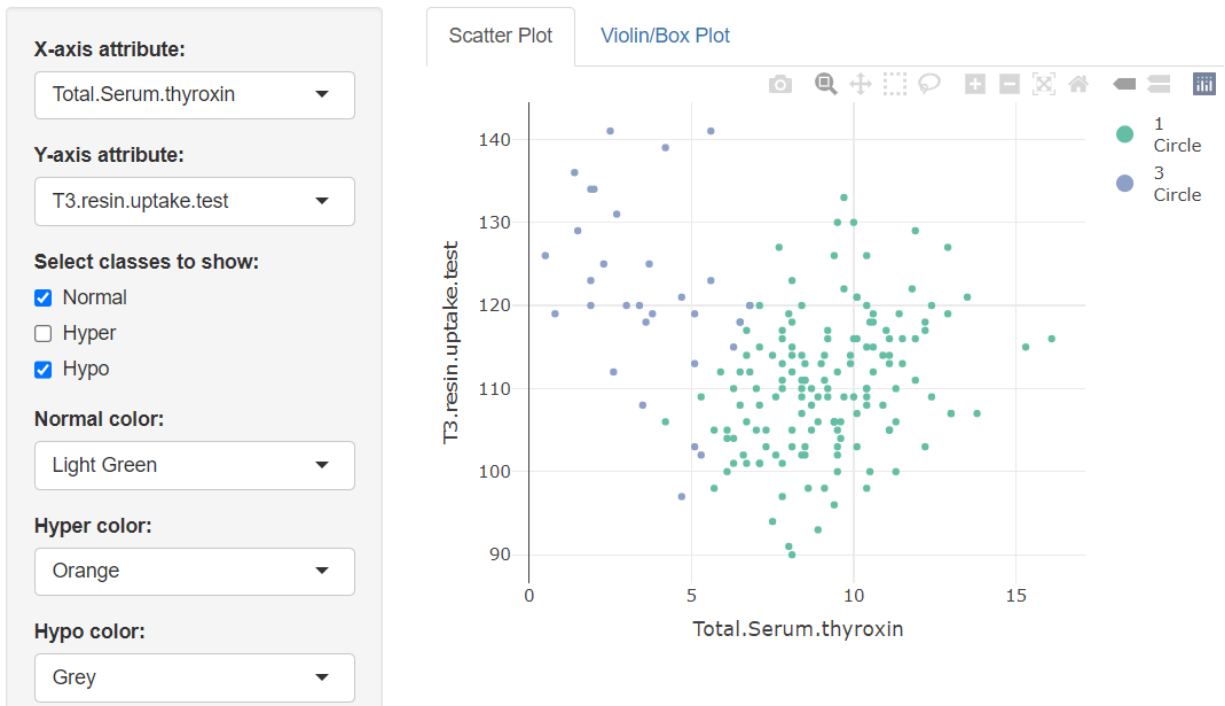
☒ Normal

☐ Hyper

☒ Hypo

Here only class Normal and Hypo are selected to visualize.

Thyroid Data Visualization



Thyroid Data Visualization

X-axis attribute:
Total.Serum.thyroxin

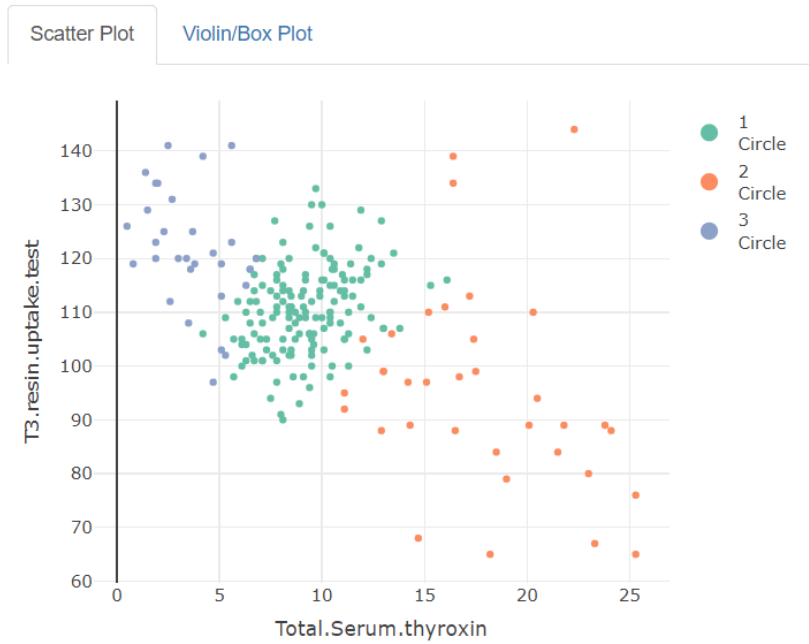
Y-axis attribute:
T3.resin.uptake.test

Select classes to show:
☒ Normal
☒ Hyper
☒ Hypo

Normal color:
Light Green

Hyper color:
Orange

Hypo color:
Grey



Thyroid Data Visualization

X-axis attribute:
Total.Serum.thyroxin

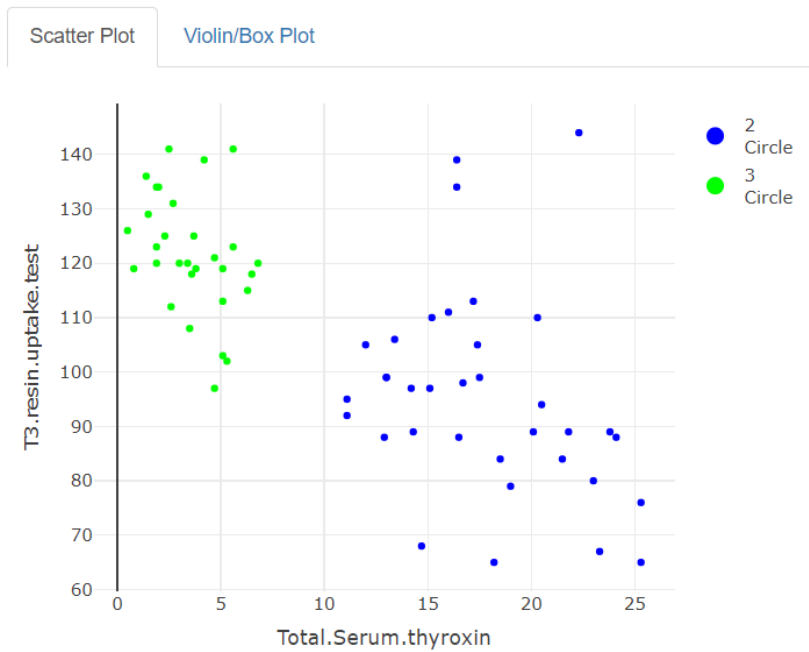
Y-axis attribute:
T3.resin.uptake.test

Select classes to show:
☐ Normal
☒ Hyper
☒ Hypo

Normal color:
Red

Hyper color:
Blue

Hypo color:
Green



- User can change the point size and shape for different classes in the scatter plot

Point size:

5 10 15

5 6 7 8 9 10 11 12 13 14 15

Point shape:

☒ Circle

☐ Square

☐ Diamond

Thyroid Data Visualization

X-axis attribute:

Total.Serum.thyroxin

Y-axis attribute:

Total.serum.triiodothyronine

Select classes to show:

☒ Normal

☒ Hyper

☒ Hypo

Normal color:

Light Green

Hyper color:

Orange

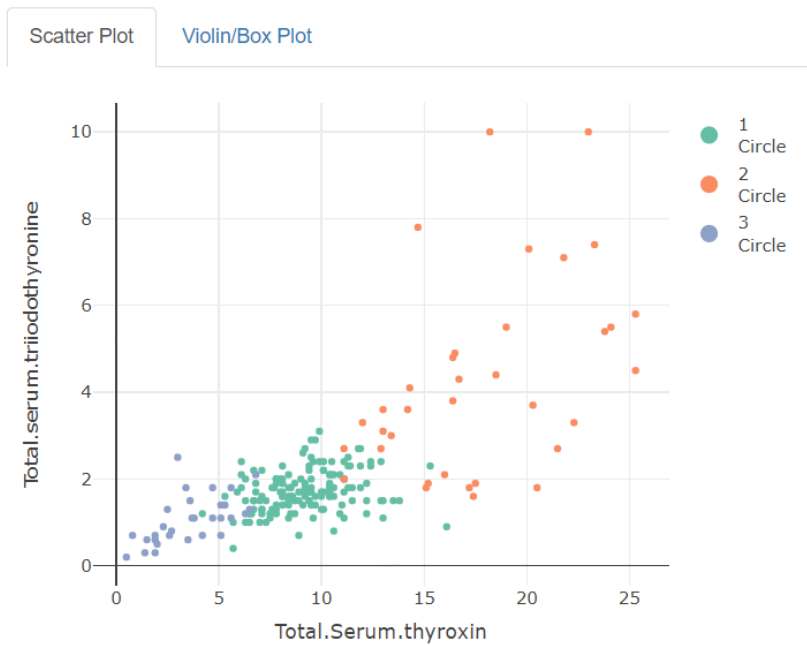
Hypo color:

Grey

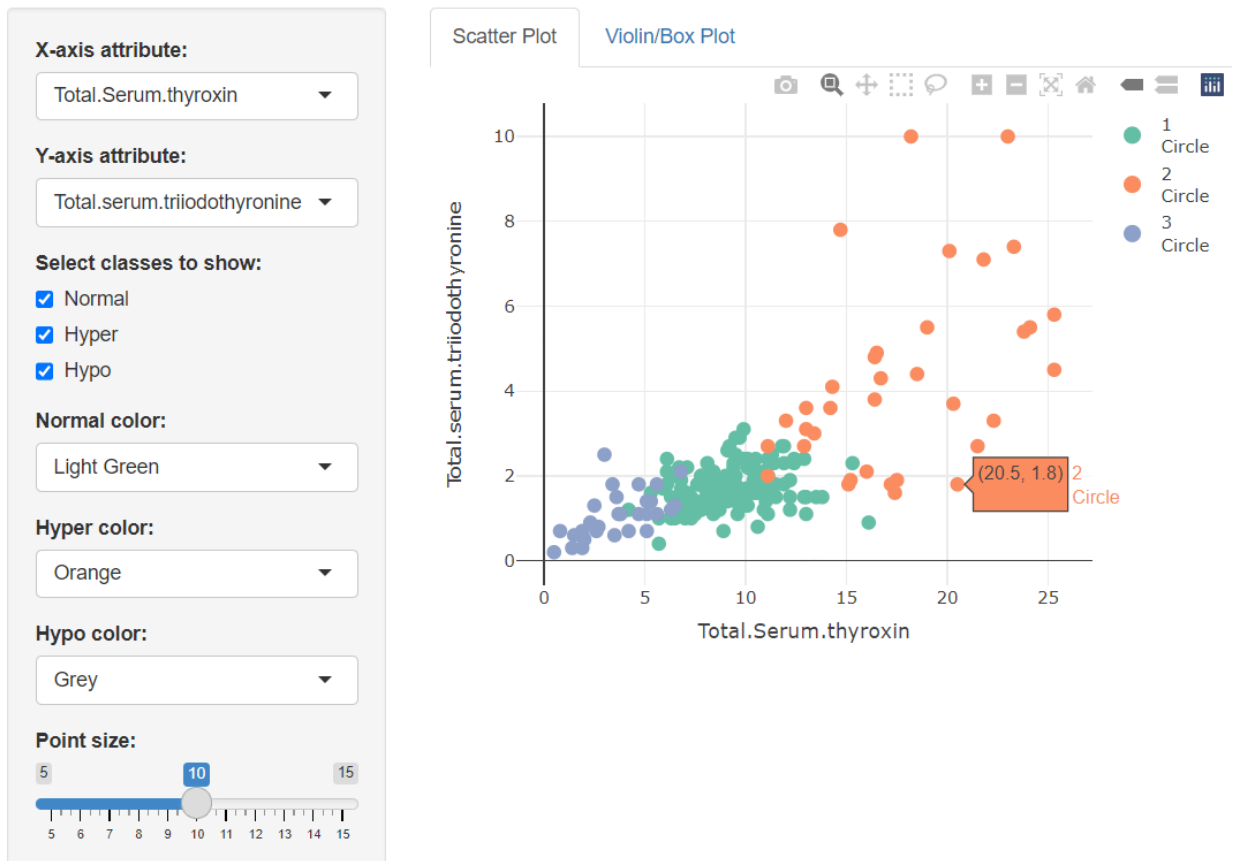
Point size:

5 15

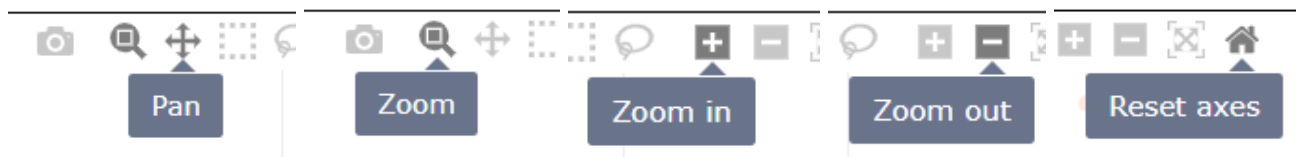
5 6 7 8 9 10 11 12 13 14 15

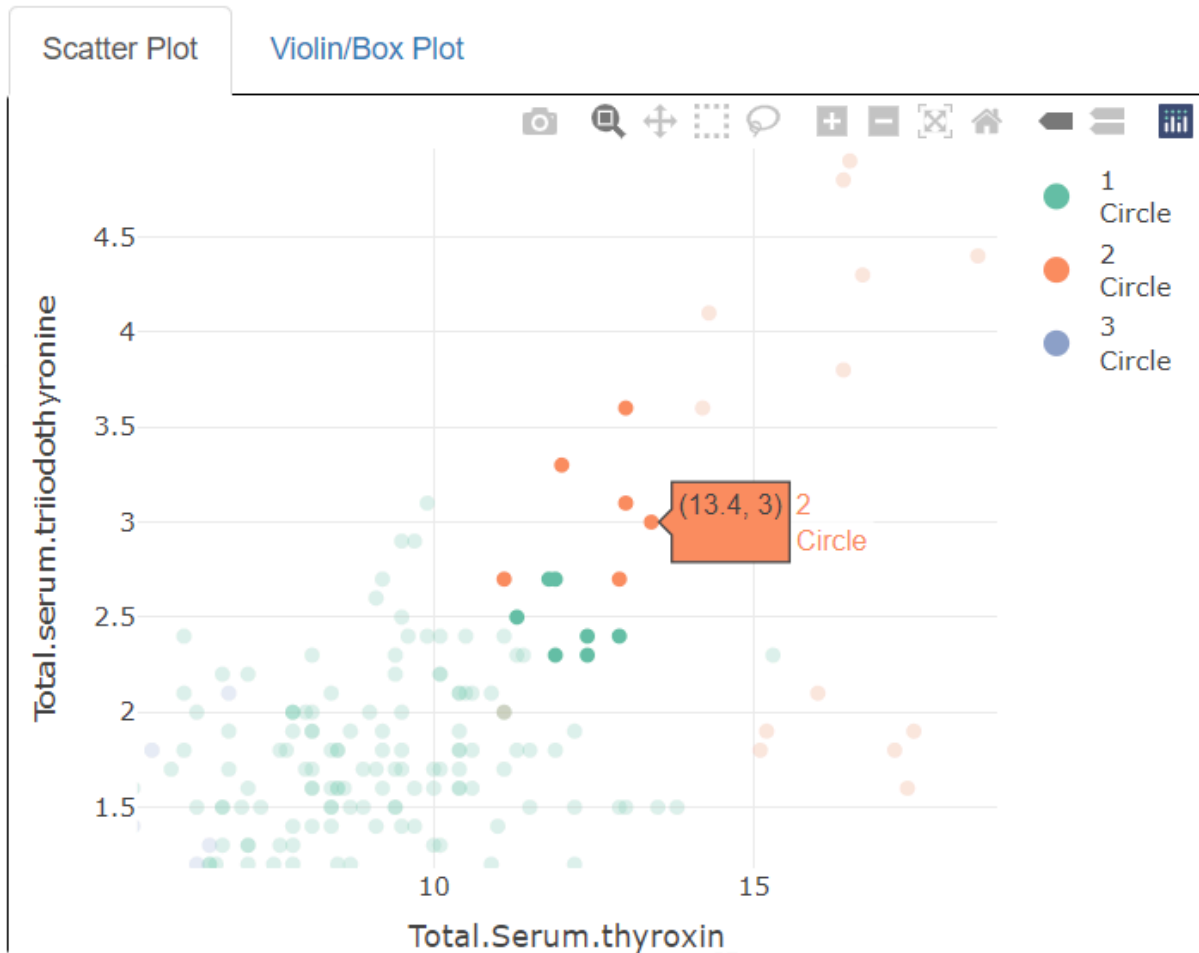


Thyroid Data Visualization



- Add Pan and Zoom to each diagram





A zoomed in view of selected points in the scatter plot.

3. violin.R :

All violin-box plot visualizations with interactivity :

- Y-axis feature selection

X-axis is for class hence its selection won't change the visualization. However user can change the Y-axis to see **box as well as violin** of the selected feature.

Thyroid Data Visualization

X-axis attribute:
T3.resin.uptake.test

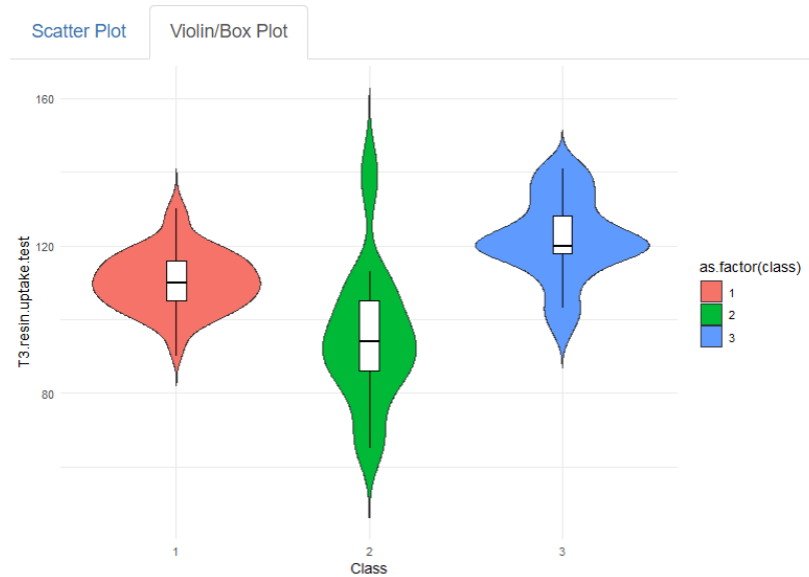
Y-axis attribute:
T3.resin.uptake.test

Select classes to show:
☒ Normal
☒ Hyper
☒ Hypo

Normal color:
Light Green

Hyper color:
Orange

Hypo color:
Grey



Thyroid Data Visualization

X-axis attribute:
T3.resin.uptake.test

Y-axis attribute:
Total.serum.triiodothyronine

Select classes to show:
☒ Normal
☒ Hyper
☒ Hypo

Normal color:
Light Green

Hyper color:
Orange

Hypo color:
Grey

