Leafs

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March 22nd 2018

Introduction

Data

Measurement Process

Data Creation

Type	Length	Width
Cherry	11.5	5.9
Cherry	16.7	9.1
Cherry	10.4	4.9
Cherry	18.1	8.4
Cherry	19.3	6.5
Cherry	12.2	8.0
Cherry	10.3	5.3
Cherry	9.9	4.3
Cherry	9.6	6.8
Cherry	19.2	10.4
Cherry	12.8	6.2
Cherry	12.1	8.3
Cherry	12.5	6.2
Cherry	8.3	4.3
Cherry	6.9	4.5
Cherry	9.2	5.5
Pear	5.3	3.1
Pear	6.9	6.2
Pear	9.2	8.9
Pear	8.5	7.5
Pear	8.2	4.1
Pear	5.7	4.0
Pear	5.8	5.1
Pear	16.8	9.9
Pear	6.1	5.9
Pear	8.9	4.1
Pear	6.4	4.4
Pear	18.8	15.2

Type	Length	Width
Cherry:16	Min. : 5.300	Min. : 3.100
Pear :12	1st Qu.: 7.875	1st Qu.: 4.475
NA	Median : 9.750	Median : 6.050

1

Type	Length	Width
NA	Mean :10.914	Mean : 6.536
NA	3rd Qu.:12.575	3rd Qu.: 8.075
NA	Max. :19.300	Max. :15.200

Classification Procedure

Training Data

New Data

Observation Space
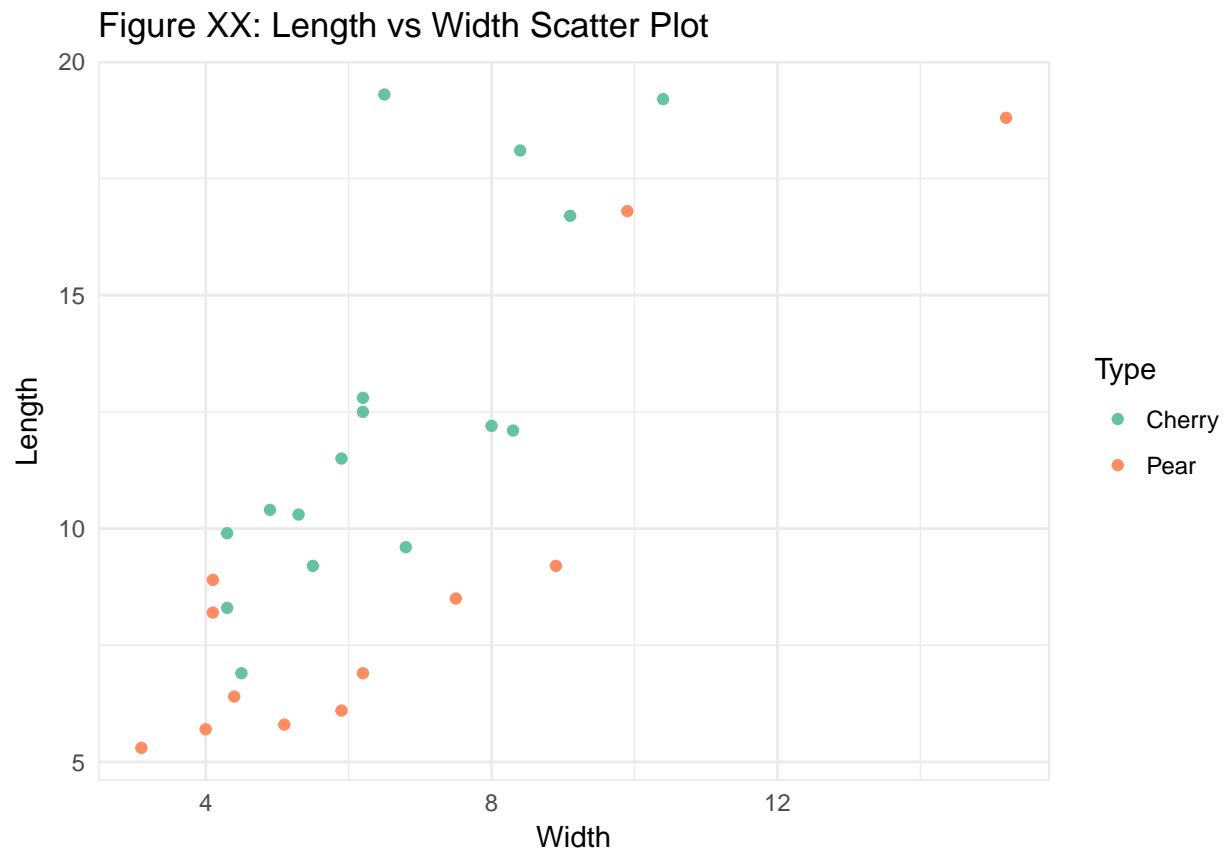
Figure XX: Length vs Width Scatter Plot

Figure XX: Length vs Width Scatter Plot
Overlayed with the Contour Plot

Figure XX: Length vs Width Scatter Plot
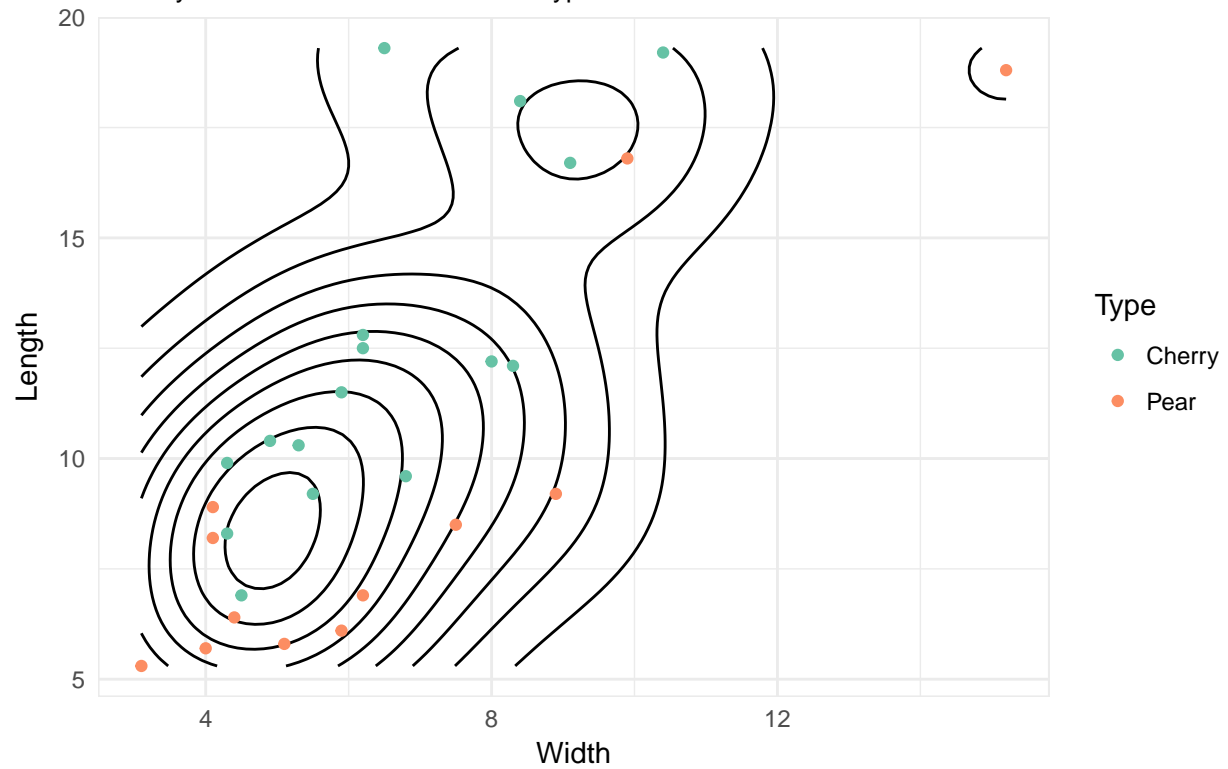Overlayed with a Contour Plot of that Type

Figure XX: Length vs Width Scatter Plot
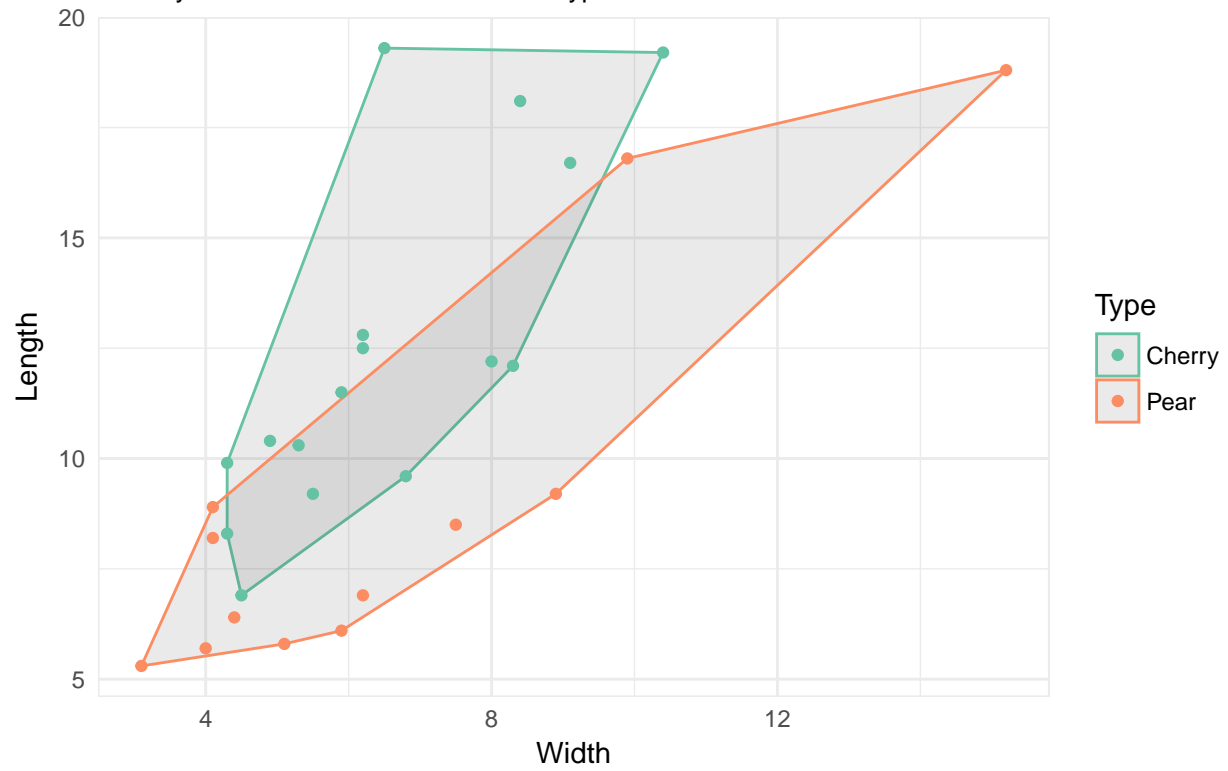
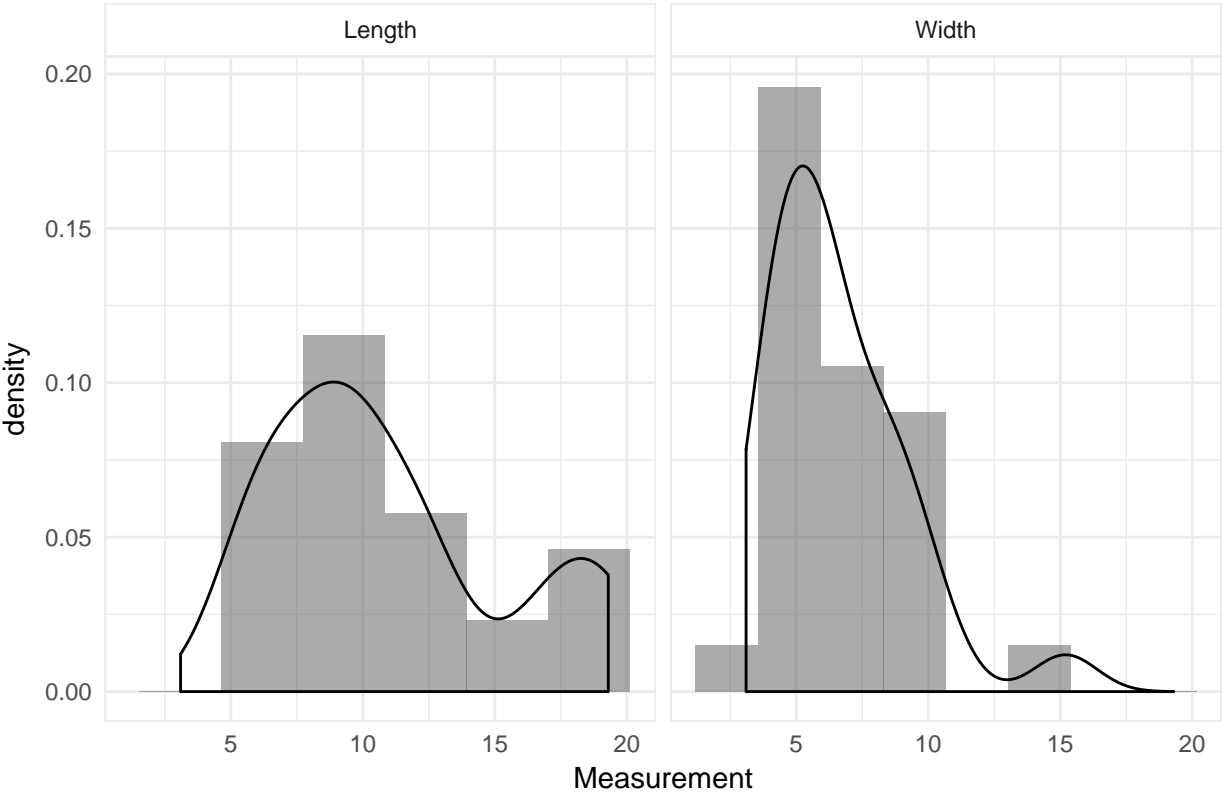Overlayed with the Convex Hull of that Type

Figure XX: Density Plot

Figure XX: Density Plot by Type
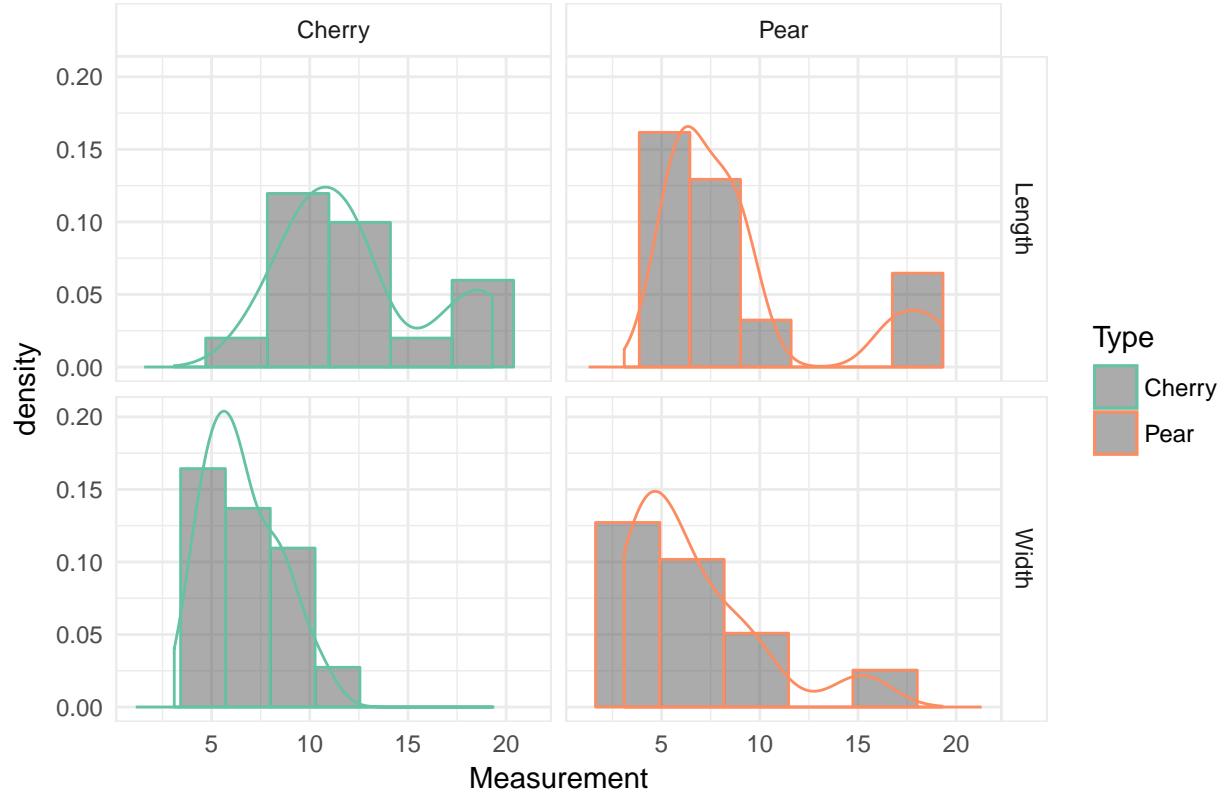
Covariance Matrix

Table 3: Shared Covariance Matrix

	Length	Width
Length	19.422011	8.476508
Width	8.476508	6.685344

Table 4: Cherry Covariance Matrix

	Length	Width
Length	15.047833	5.443833
Width	5.443833	3.357167

Table 5: Pear Covariance Matrix

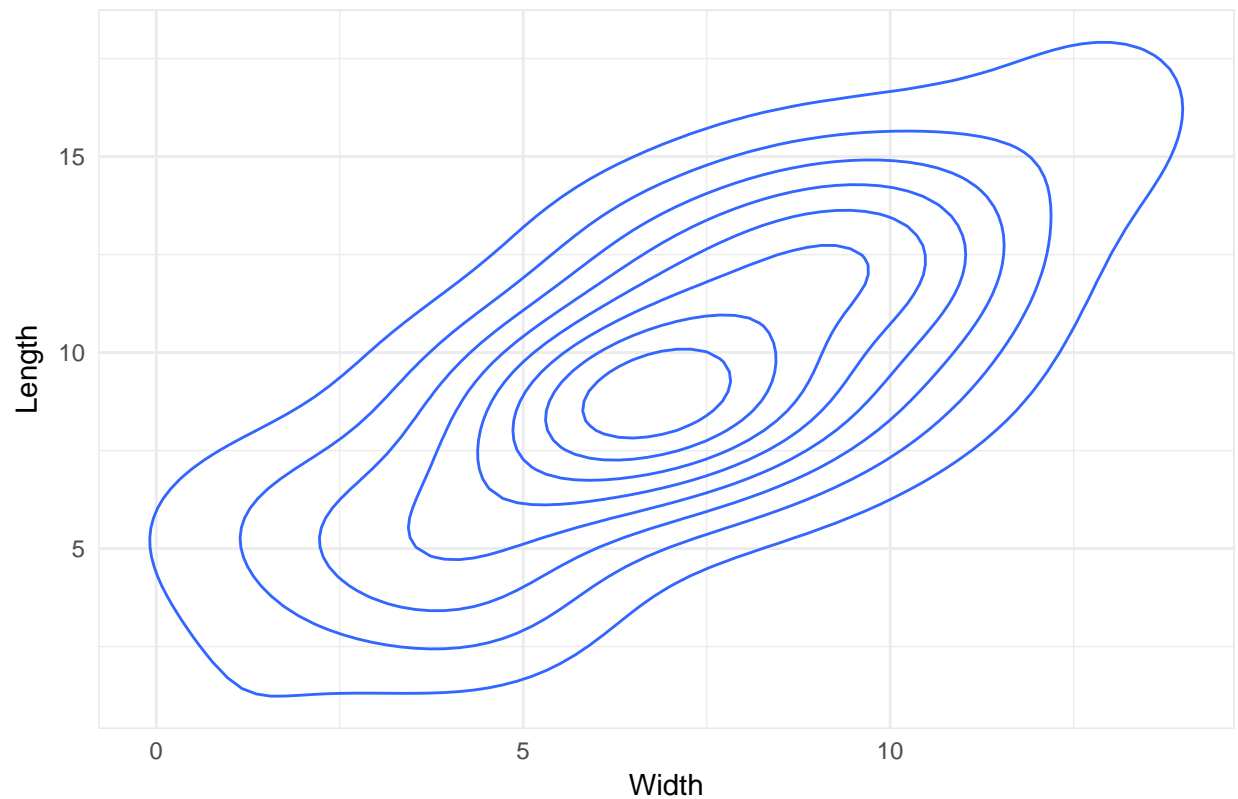|	Length	Width
Length	19.27788	13.37333
Width	13.37333	11.83152

Simulated Data (All)
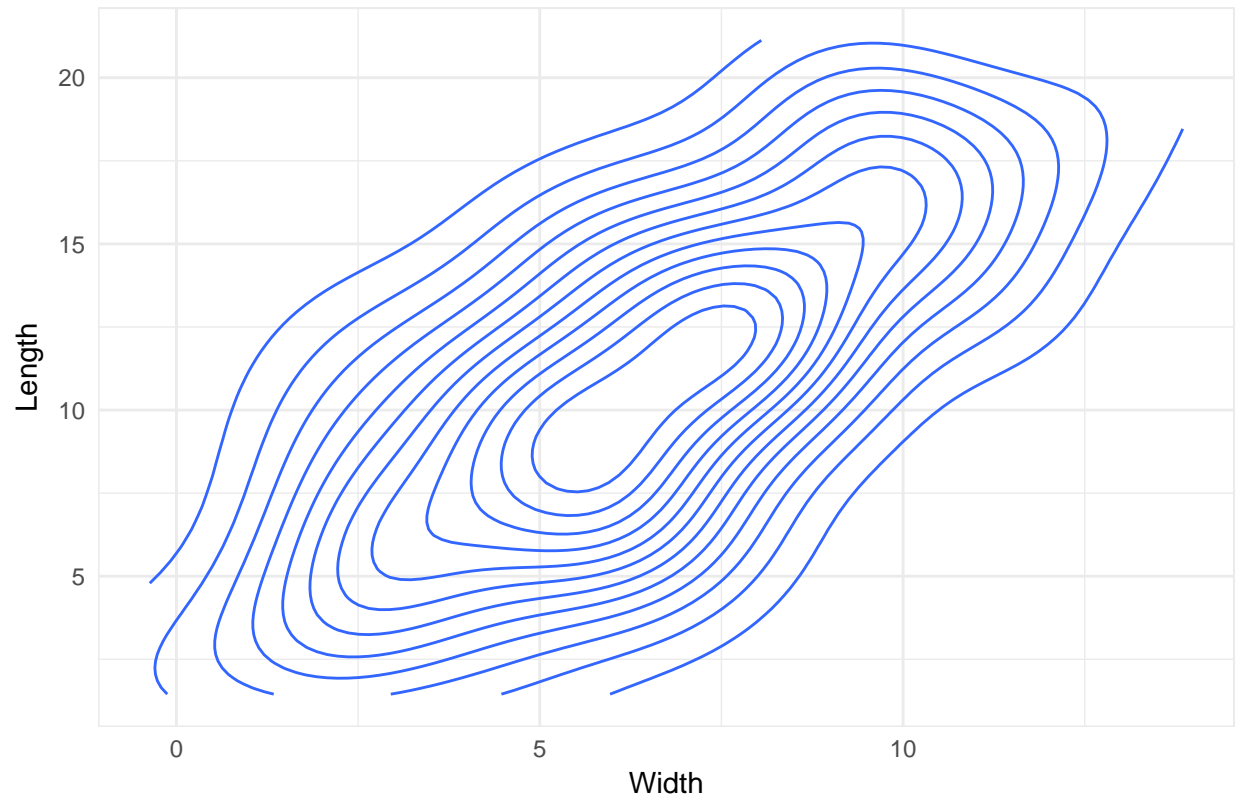
Simulated Data (Cherry)
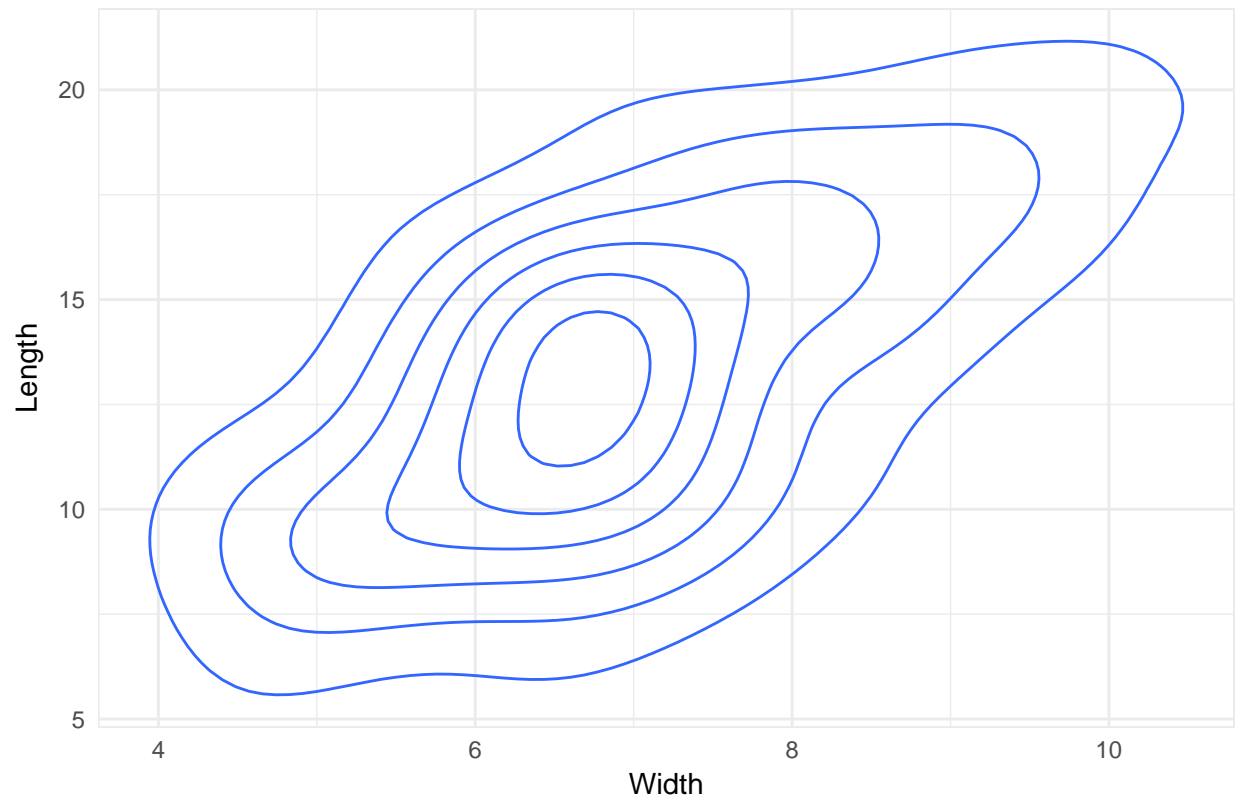
Simulated Data (Pear)


```
## $Length
## [1]  5.300000  7.633333  9.966667 12.300000 14.633333 16.966667 19.300000
##
## $Width
## [1]  3.100000  5.116667  7.133333  9.150000 11.166667 13.183333 15.200000
##
## $Density
##                                 3.1 5.11666666666667 7.13333333333333
## 5.3              8.447458e-03        0.012017959        0.005149716
## 7.63333333333333 1.124607e-02        0.018558765        0.010136059
## 9.96666666666667 8.369715e-03        0.017477410        0.012579266
## 12.3             3.111530e-03        0.010275365        0.010725536
## 14.6333333333333 5.401377e-04        0.003131359        0.004983311
## 16.9666666666667 9.644419e-05        0.001089739        0.003687849
## 19.3             1.168969e-04        0.001447540        0.003669233
##                                9.15 11.1666666666667 13.1833333333333
## 5.3              0.000930451        9.637295e-05        2.737286e-06
## 7.63333333333333 0.003445585        5.207249e-04        1.580038e-05
## 9.96666666666667 0.005470224        8.414374e-04        2.383664e-05
## 12.3             0.005113882        7.579625e-04        2.683754e-05
## 14.6333333333333 0.004375421        1.510035e-03        1.826390e-04
## 16.9666666666667 0.006526390        3.339904e-03        8.045625e-04
## 19.3             0.004909057        2.998742e-03        1.108098e-03
##                                15.2
## 5.3              1.190966e-08
## 7.63333333333333 6.917012e-08
```

```
## 9.96666666666667 1.475094e-07
## 12.3           6.609198e-06
## 14.6333333333333 1.969106e-04
## 16.9666666666667 1.339082e-03
## 19.3           2.051062e-03
```

Conclusion