

Section 4: Plots for continuous variables

Review of important functions covered in this section:

Functions

| | |
|--------------------------------------|---|
| stem | Stem-and-leaf display |
| stem.leaf | Stem-and-leaf display (aplpack package) |
| hist | Histogram |
| density | Density estimate |
| polygon | Polygon plot |
| curve | Draws curve based on provided function |
| rug | Adds rug to the current plot |
| Arguments of boxplot function | |
| boxwex | A scale that applies to all boxes |
| notch | A notch applied in each side if set as TRUE |
| outpch | Outlier symbol specification |
| varwidth | Width proportional to function of observation number if set as TRUE |
| boxcol | Box outline line color |
| boxlwd | Box outline line width |
| medcol | Median line col |
| whiskcol | Whisker color |
| whisklwd | Whisker line width |
| staplecol | staple color |
| staplelwd | staple line width |
| outcol | Outlier col |
| outlwd | Outlier line width |
| axes | Whether axes will be drawn |
| main | Title |
| sub | Sub-title |
| xlab | Horizontal axis title |
| ylab | Vertical axis title |

Exercise

We'll work with `warpbreaks` dataset (The Number of Breaks in Yarn during Weaving).

- Find the breaks for those with A and B type of wool and save them separately as R object `bA` and `bB`.

```
bA = warpbreaks$breaks[warpbreaks$wool == "A"]  
bB = warpbreaks$breaks[warpbreaks$wool == "B"]
```

- b. Draw stem and leaf display for bA and bB separately.

stem(bA)

The decimal point is 1 digit(s) to the right of the |

| | | |
|---|--|-----------|
| 1 | | 0257888 |
| 2 | | 114566689 |
| 3 | | 00566 |
| 4 | | 3 |
| 5 | | 124 |
| 6 | | 7 |
| 7 | | 0 |

stem(bB)

The decimal point is 1 digit(s) to the right of the |

| | | |
|---|--|---------|
| 1 | | 34 |
| 1 | | 5566799 |
| 2 | | 00114 |
| 2 | | 6788999 |
| 3 | | 1 |
| 3 | | 99 |
| 4 | | 124 |

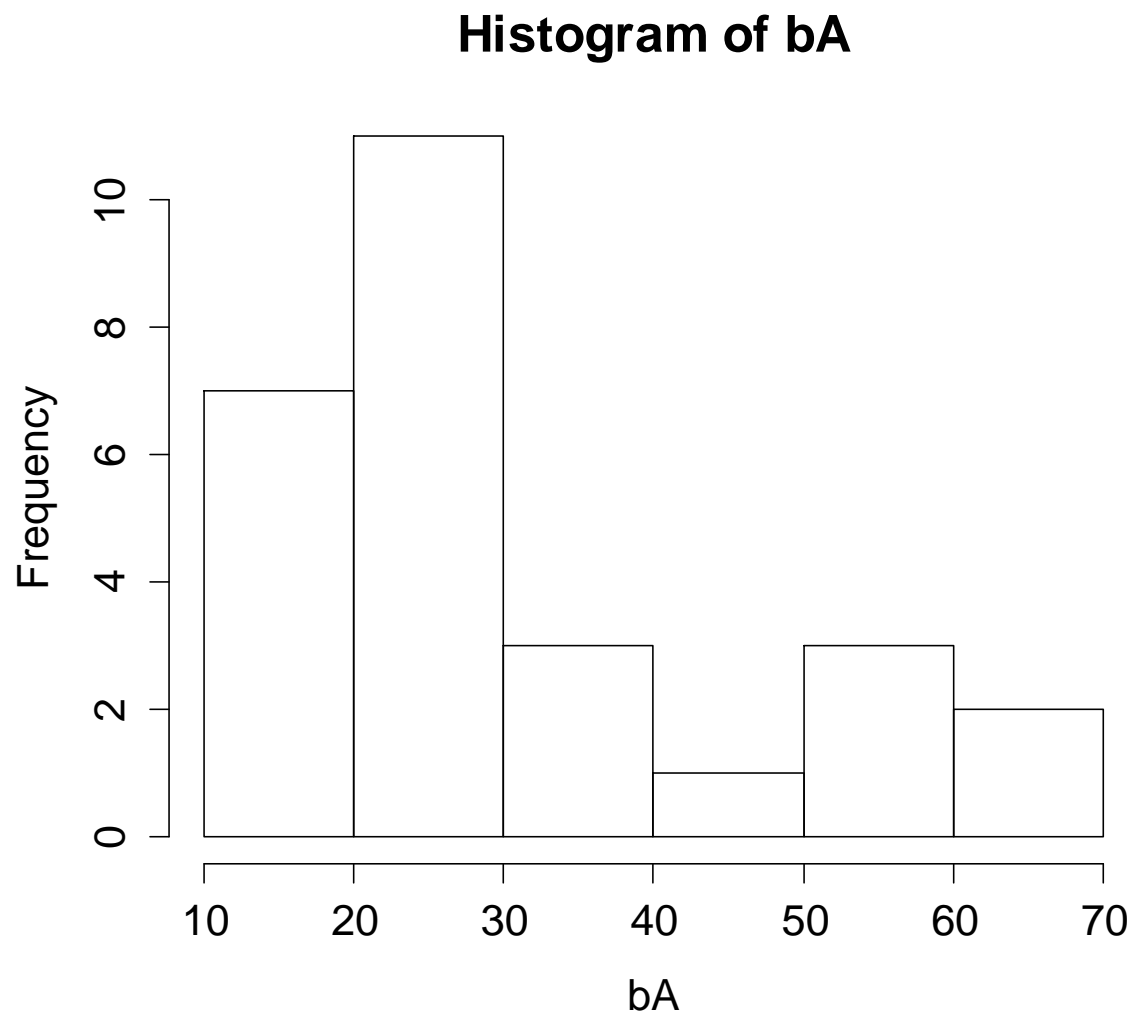
- c. Draw a back-to-back stem and leaf display for bA and bB. (Hint: use aplpack package)

stem.leaf.backback(bA, bB)

| 1 2: represents | | 12, leaf unit: 1 | |
|-------------------|--------|------------------|---------|
| bA | | bB | |
| 2 | 20 | 1* | 34 |
| 7 | 88875 | 1. | 5566799 |
| 10 | 411 | 2* | 00114 |
| (6) | 986665 | 2. | 6788999 |
| 11 | 00 | 3* | 1 |
| 9 | 665 | 3. | 99 |
| 6 | 3 | 4* | 124 |
| | | 4. | |
| 5 | 421 | 5* | |
| | | 5. | |
| | | 6* | |
| HI: 67 70 | | | |
| n: 27 | | 27 | |

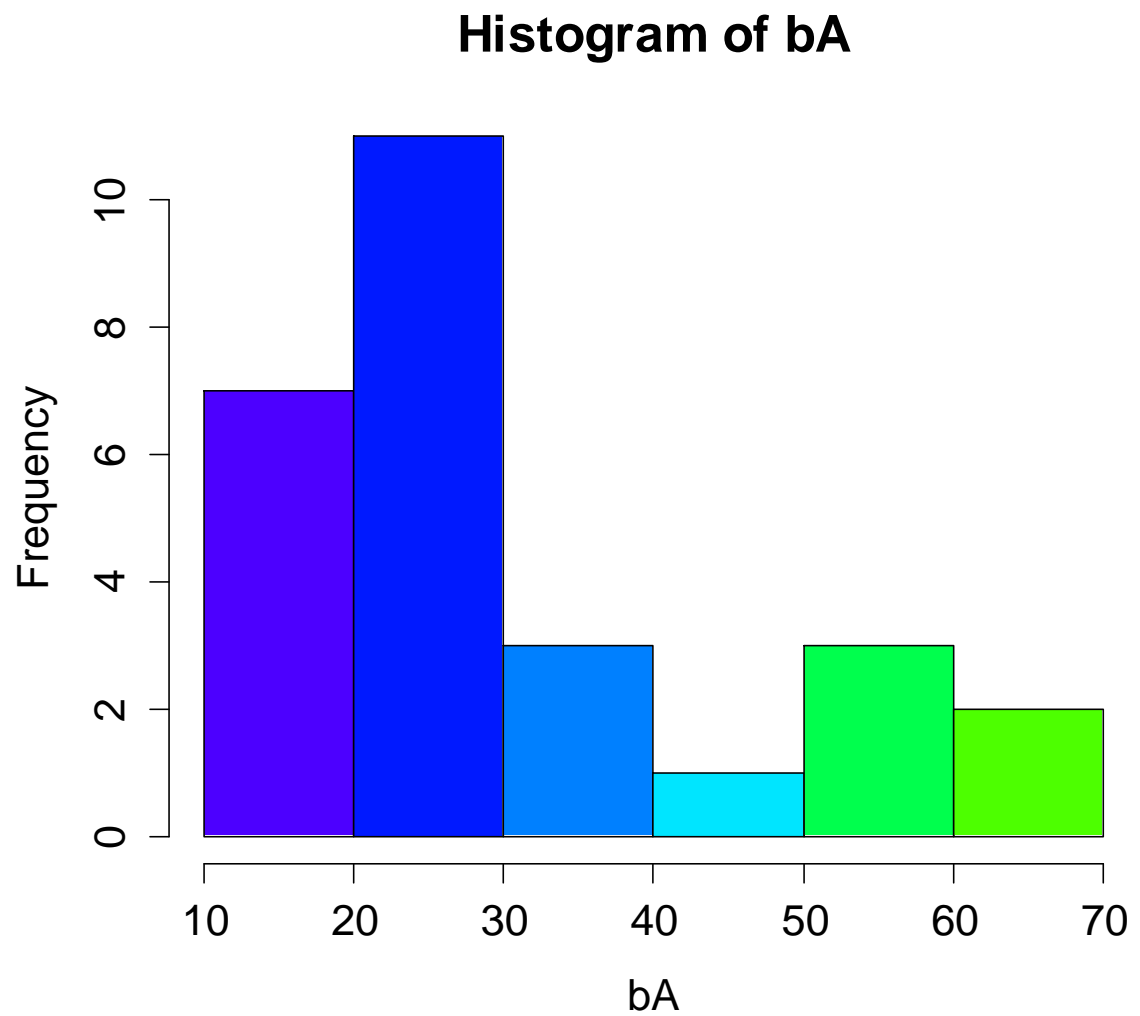
d. Draw histogram of bA.

```
hist(bA)
```



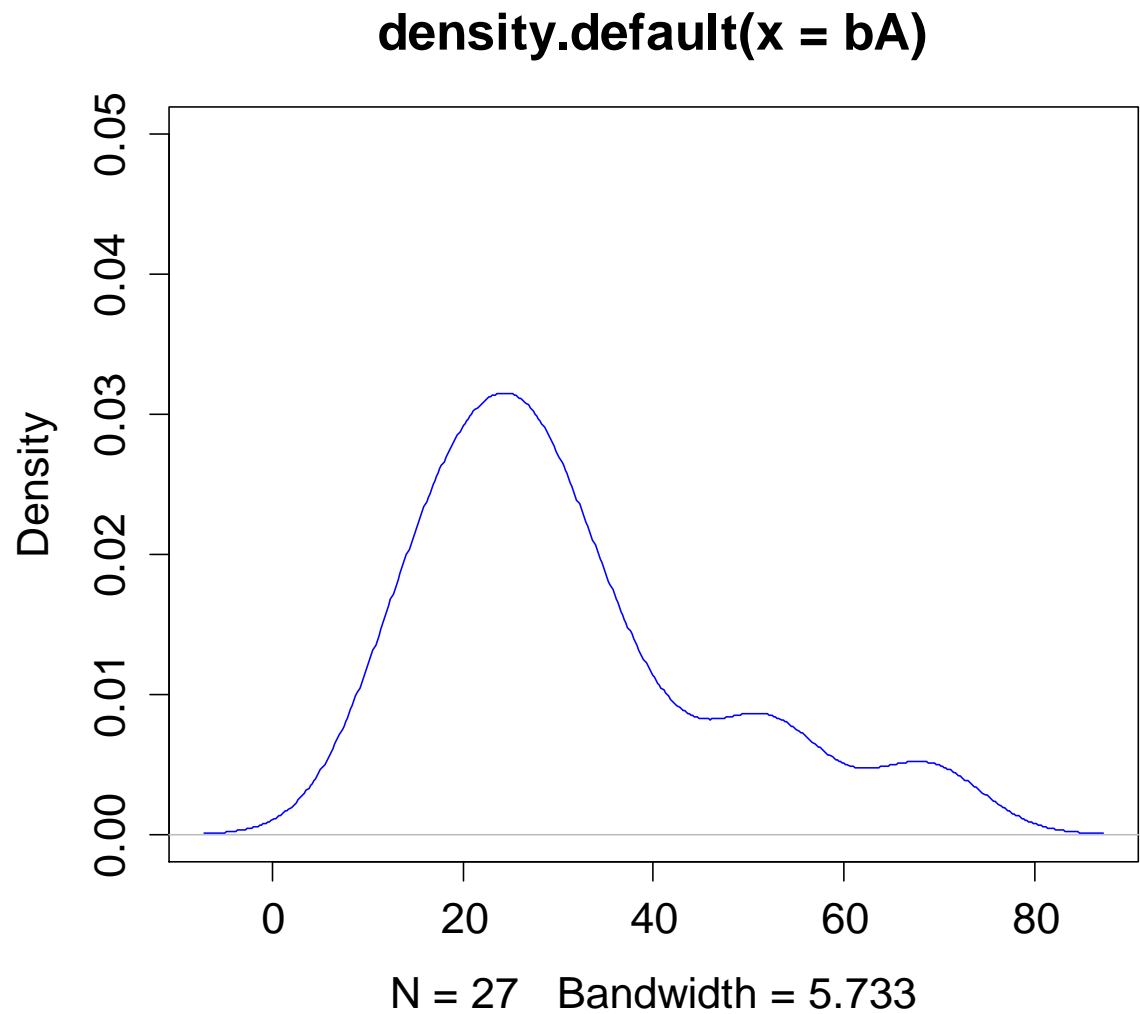
e. Draw the same histogram with topo color palettes.

```
hist(bA, col = topo.colors(10))
```



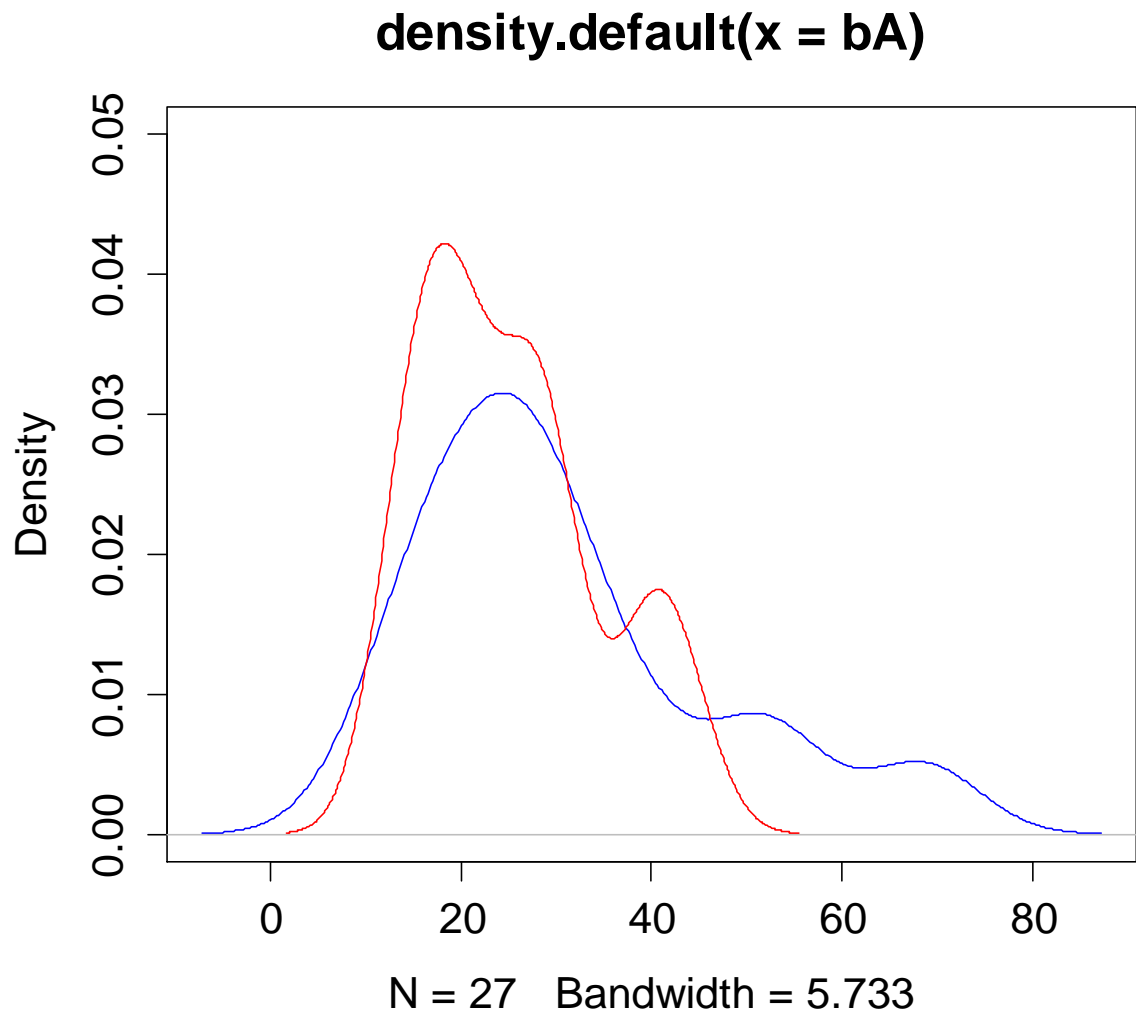
f. Plot a blue density plot using bA with vertical limit up to 0.05.

```
plot(density(bA), ylim = c(0,.05), col = "blue")
```



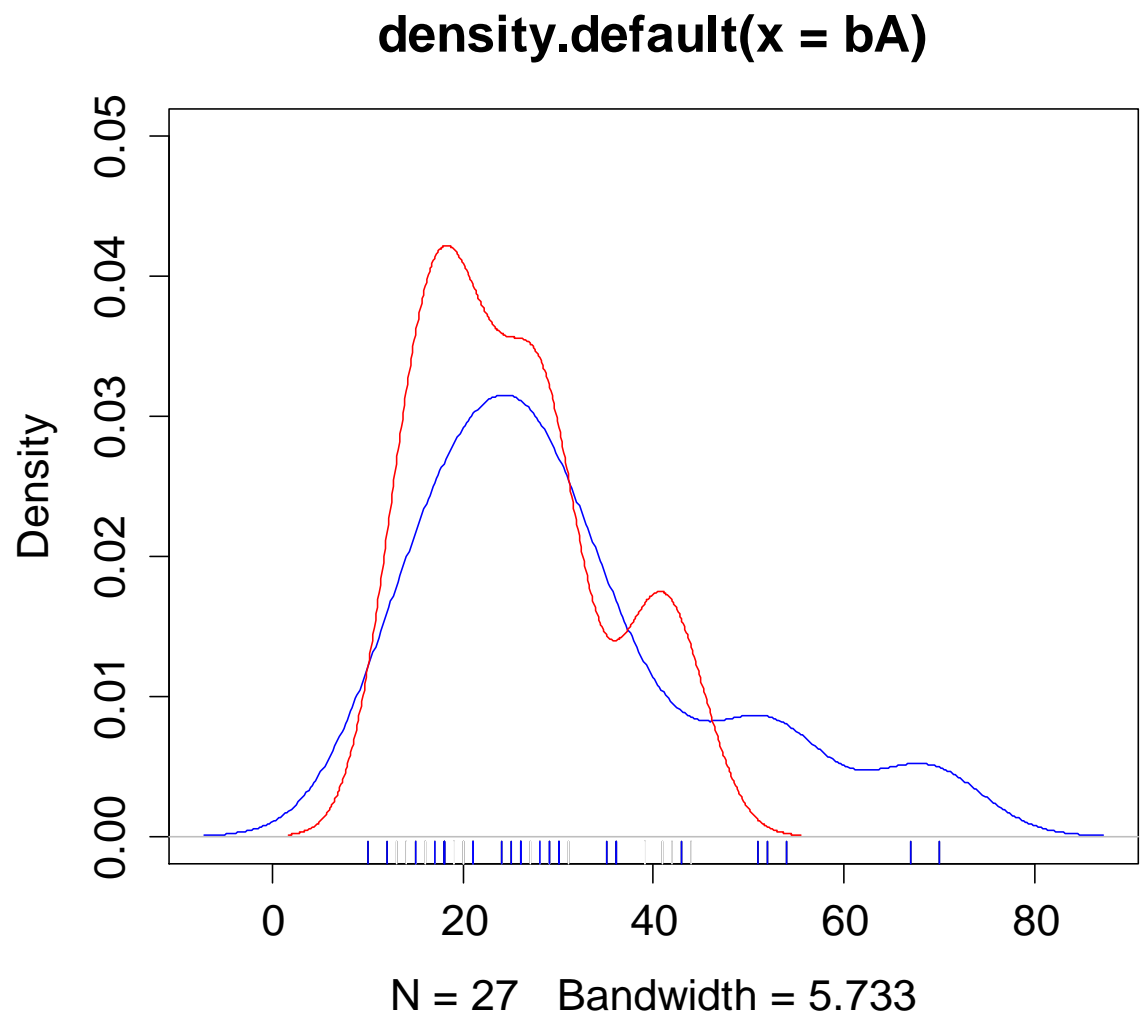
g. Add a red density plot using the variable bB.

```
lines(density(bB), col = "red")
```



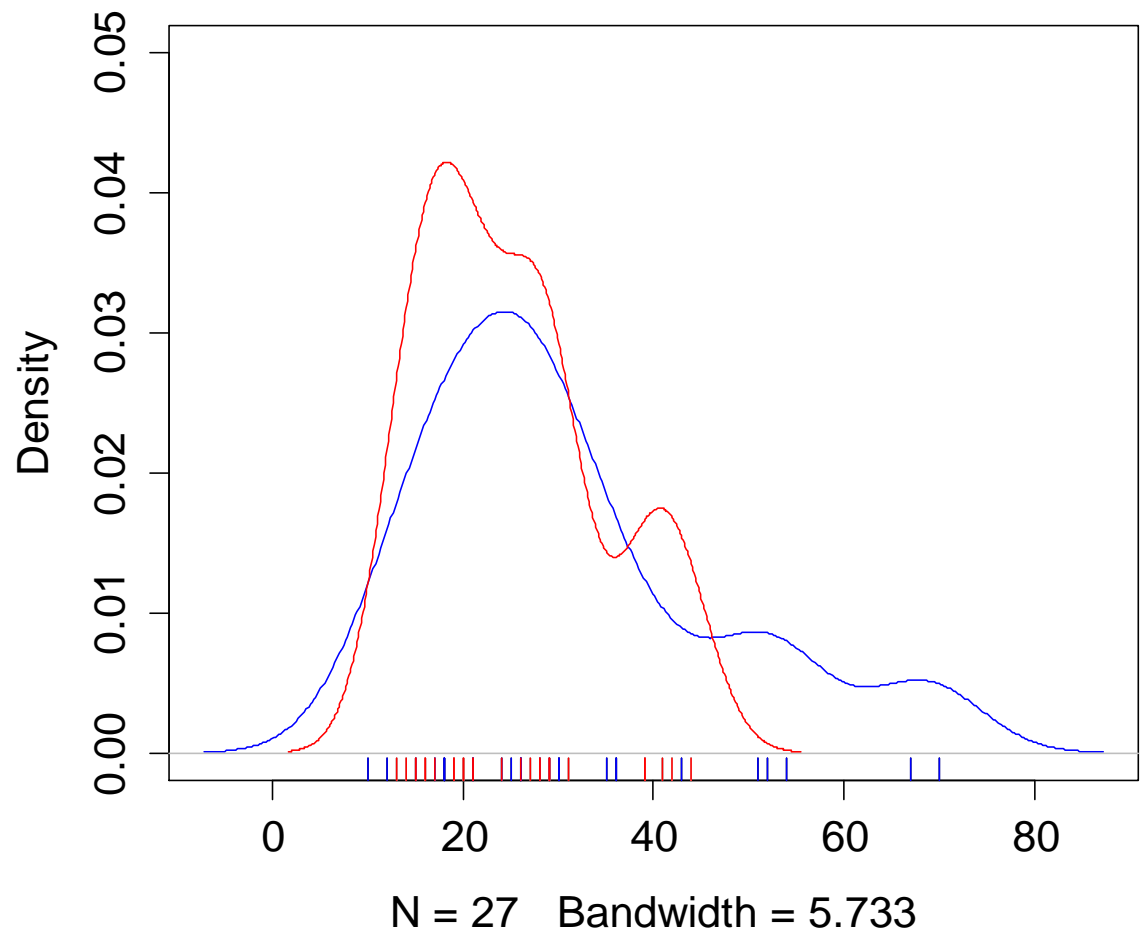
h. Add a rug plot of bA and bB.

```
rug(bA, col = "blue")
```



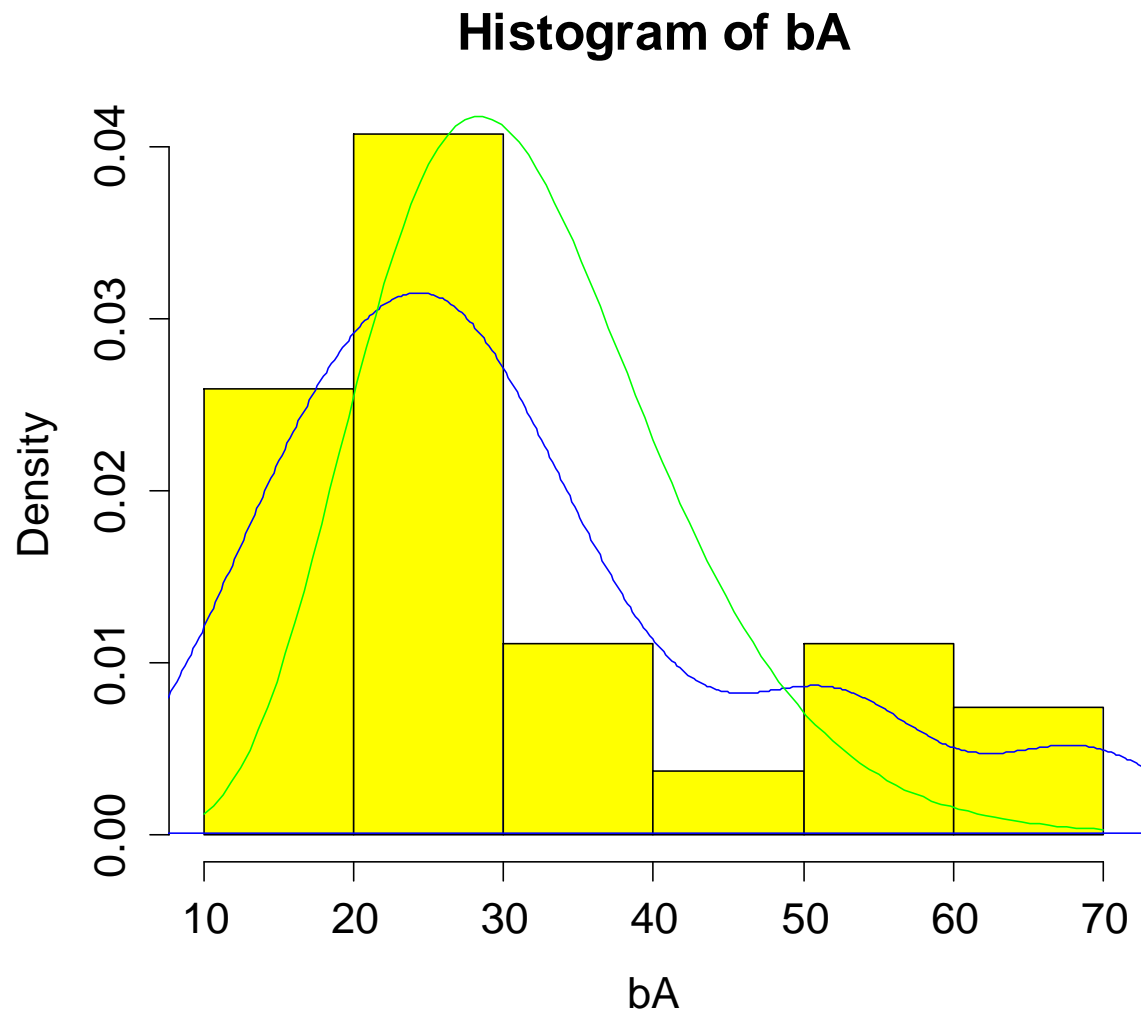
```
rug(bB, col = "red")
```

density.default(x = bA)



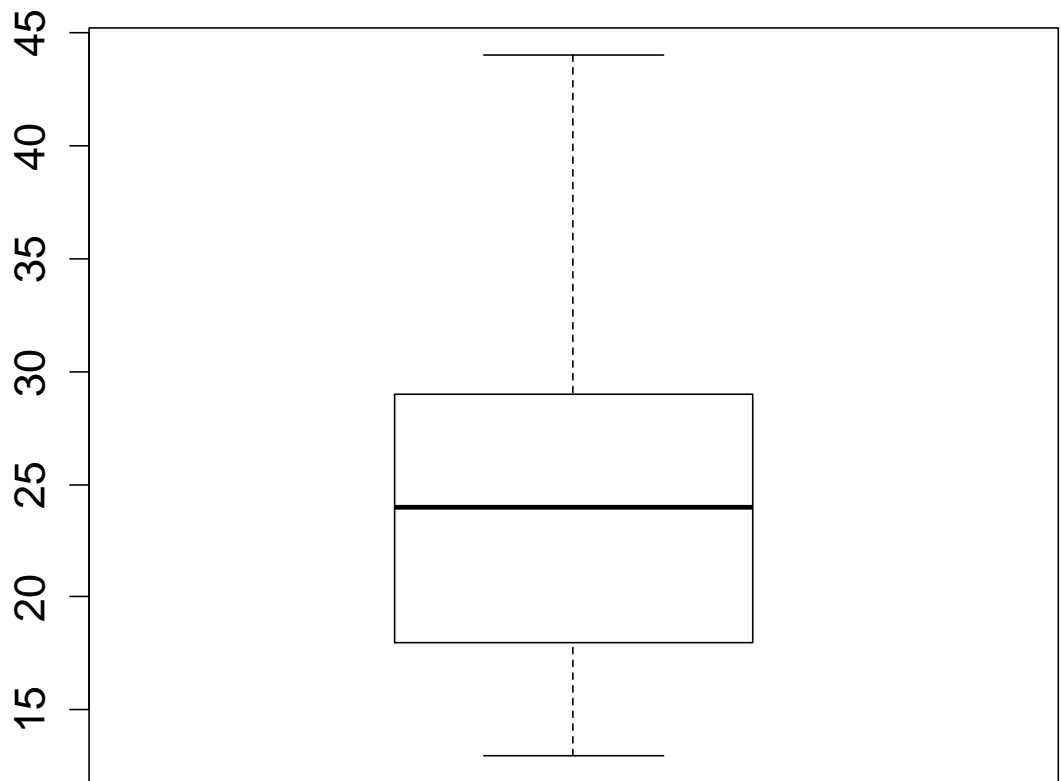
- i. Draw a yellow histogram of the object bA and add a blue polygon of the same variable on top of the histogram. In the same plot, add a green curve from gamma distribution with shape parameter 10 and scale parameter 3.15.

```
hist(bA, prob = TRUE, col = "yellow")  
polygon(density(bA), border = "blue")  
curve(dgamma(x, shape = 10, scale = 3.15), col = "green", add = TRUE)
```



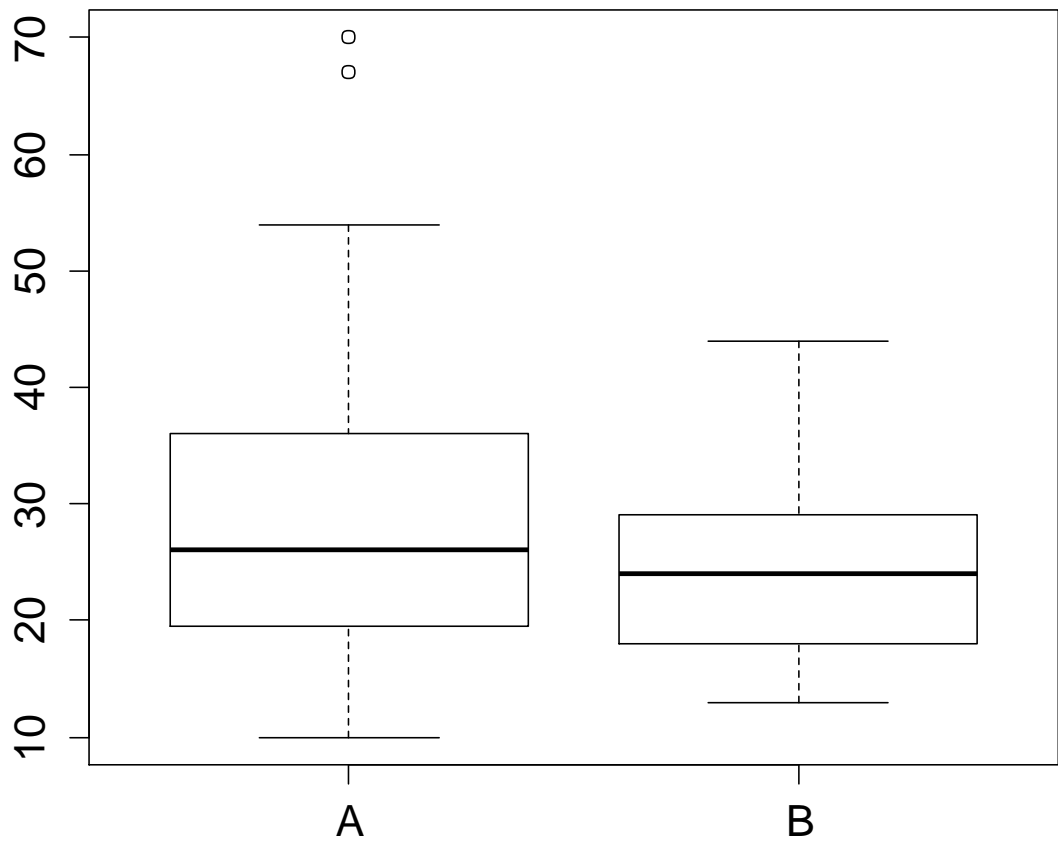
j. Draw a boxplot of the object bB.

```
boxplot(bB)
```



k. Draw side-by-side-boxplots of the breaks categorized by wool variable.

```
boxplot(warpbreaks$breaks ~ warpbreaks$wool)
```



- I. Draw light grey side-by-side-boxplots of the breaks categorized by tension variable, where width of the box is proportional to observation number, box color is blue, median line is red, whisker color is green, staple color is pink and outlier color is black.

```
boxplot(breaks~tension, data = warpbreaks, varwidth = TRUE,  
col = "lightgrey", boxcol = "blue", medcol = "red",  
whiskcol = "dark green", staplecol = "pink", outcol = "black")
```

