

# The University of British Columbia

## Data Science 550 Data Visualization I

### Lab Assignment 1

In this lab, you will learn how to create Shiny apps for the creation of basic data displays to run on your own local webserver.

1. Install the *shiny* package into R:

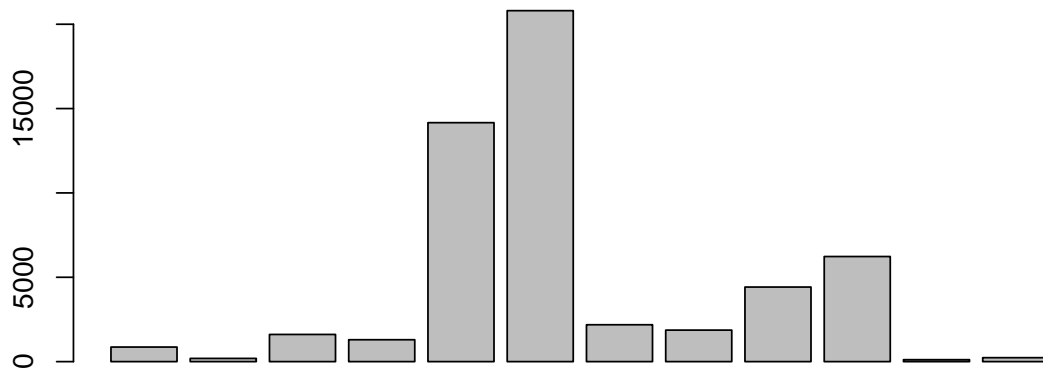
```
install.packages("shiny")
```

You can also do this in RStudio, using the menu system.

2. Download the files *server.R* and *ui.R* in the folder called **barChart**, and locate them in a folder also called **barChart** which should be located in R's current working directory on your system. These files contain code for a shiny app which can be run on a webserver for creation of bar charts. From within your R session, open the shiny app in a web browser by typing

```
runApp("barChart/")
```

A user can then type in data which is then displayed with a bar chart. Typically, bar charts are used to display count data, such as numbers of different types of events, or numbers of objects. Use the web interface to reproduce the following chart:



which displays the numbers of police officers in the 12 Canadian provinces and territories during the year 1995, as reported by Statistics Canada:

##	NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	YK	NW
##	864	191	1611	1298	14163	20804	2186	1868	4420	6230	116	234

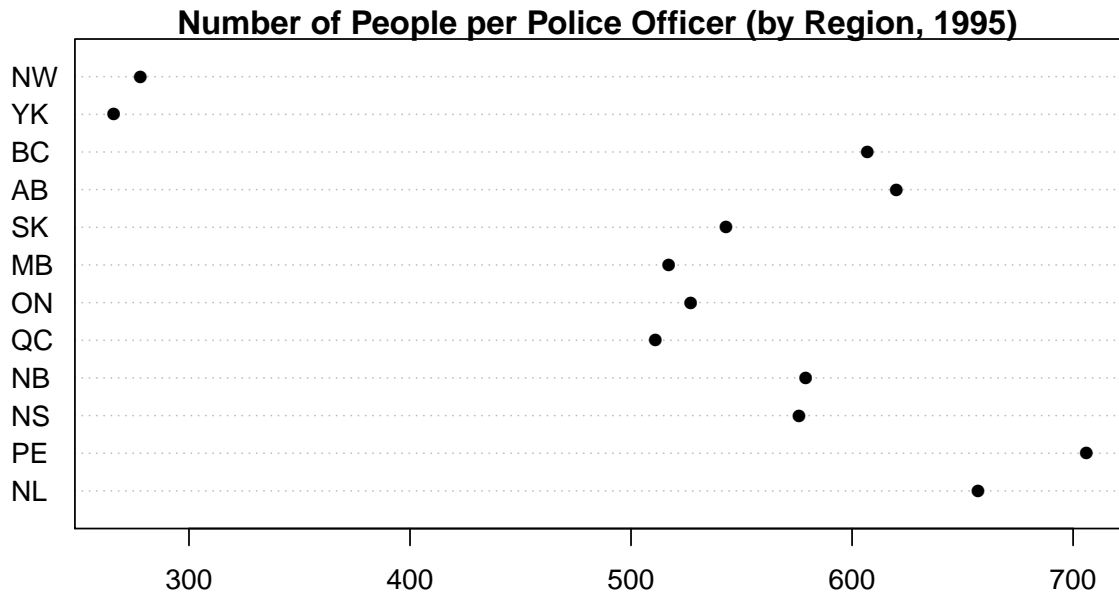
Note that you can cut and paste the data into the interface, to avoid typing.

3. List three ways in which the above chart is an inadequate representation of the data. Try out the code in **barchartrv** to begin to see some possibilities for improvement.

- Download the files *server.R* and *ui.R* in the folder called **dotChart**, and locate them in a folder also called **dotChart** which should be located in R's current working directory on your system. These files contain code for a shiny app which can be run on a webserver for creation of dot charts. From within your R session, open the shiny app in a web browser by typing

```
runApp("dotChart/")
```

The following figure displays population per police officer for each Canadian province and territory for the year 1995:



The plotted data are

```
## [1] 657 706 576 579 511 527 517 543 620 607 266 278
```

Enter the data supplied above into the app, together with an appropriate title and axis labels.

- Study the **dotChart** *server.R* and *ui.R* files carefully, and use them as a guide for updating the corresponding files in **barChart** so that the bar chart app has an option for including a title and x-axis labels.
- Create a new folder called **scatterPlot**, copying the *server.R* and *ui.R* files into it. Modify these two files appropriately, so that you obtain a new app which is capable of producing a scatter plot of user supplied data. In particular, the *ui.R* file should contain code similar to the following:

```
plot(y ~ x, las = 1, ylab=ylabel)
title(plotTitle)
lines(y ~ x)
```

The app should be able to reproduce the figure pictured on the following page using the data

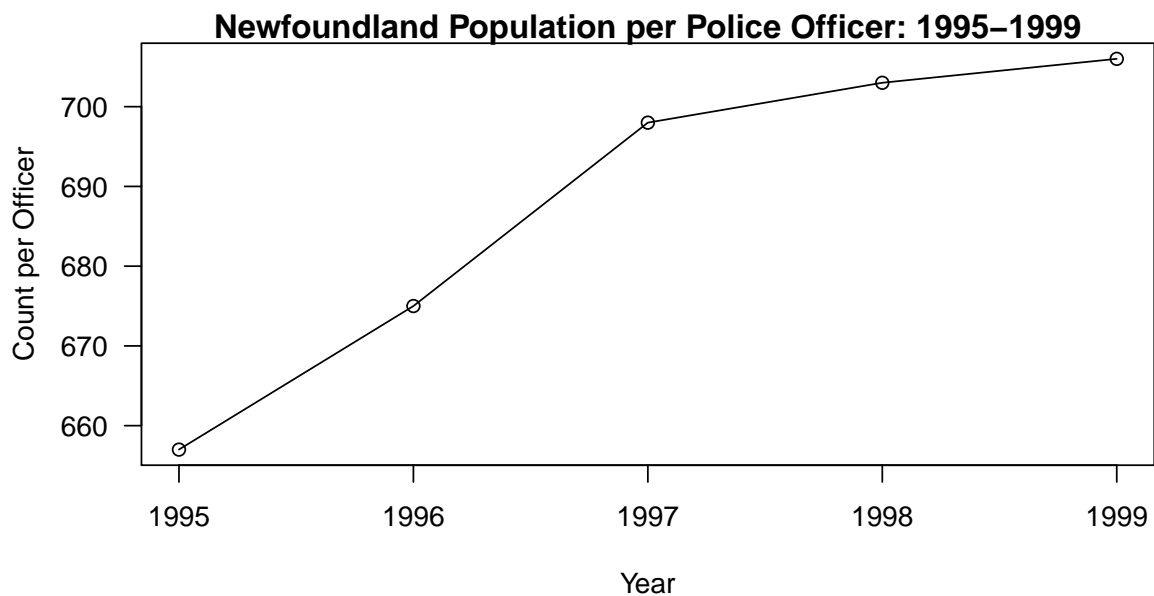
```
y
```

```
## [1] 657 675 698 703 706
```

and

```
x
```

```
## [1] 1995 1996 1997 1998 1999
```



What does the `las` parameter control?

7. The data in *gas.txt* are octane ratings for a collection of aliquots of gasoline. Create a shiny app that constructs a boxplot of the data, and use that app to explore the data. Given what octane ratings would be expected to be, for premium gasoline, what does the boxplot reveal about the data?
8. Repeat the preceding exercise using the `hist()` function. This time, remove the extreme outlier, so that you can properly visualize the distribution of the octane measurements.