MATH 3070 Lab Project 7

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Contents

Remember: I expect to see commentary either in the text, in the code with comments created using `#`*, or (preferably) both!* ***Failing to do so may result in lost points!***

Problem 1 (Verzani problem 3.2)

For the `michelson` *(**MASS**) data set, produce a density plot comparing* `Speed` *between Experiments 1 and 2.*

```
# Your code here
require(UsingR)
```

```
## Loading required package: UsingR
```

```
## Loading required package: MASS
```

```
## Loading required package: HistData
```

```
## Loading required package: Hmisc
```

```
## Loading required package: lattice
```

```
## Loading required package: survival
```

```
## Loading required package: Formula
```

```
## Loading required package: ggplot2
```

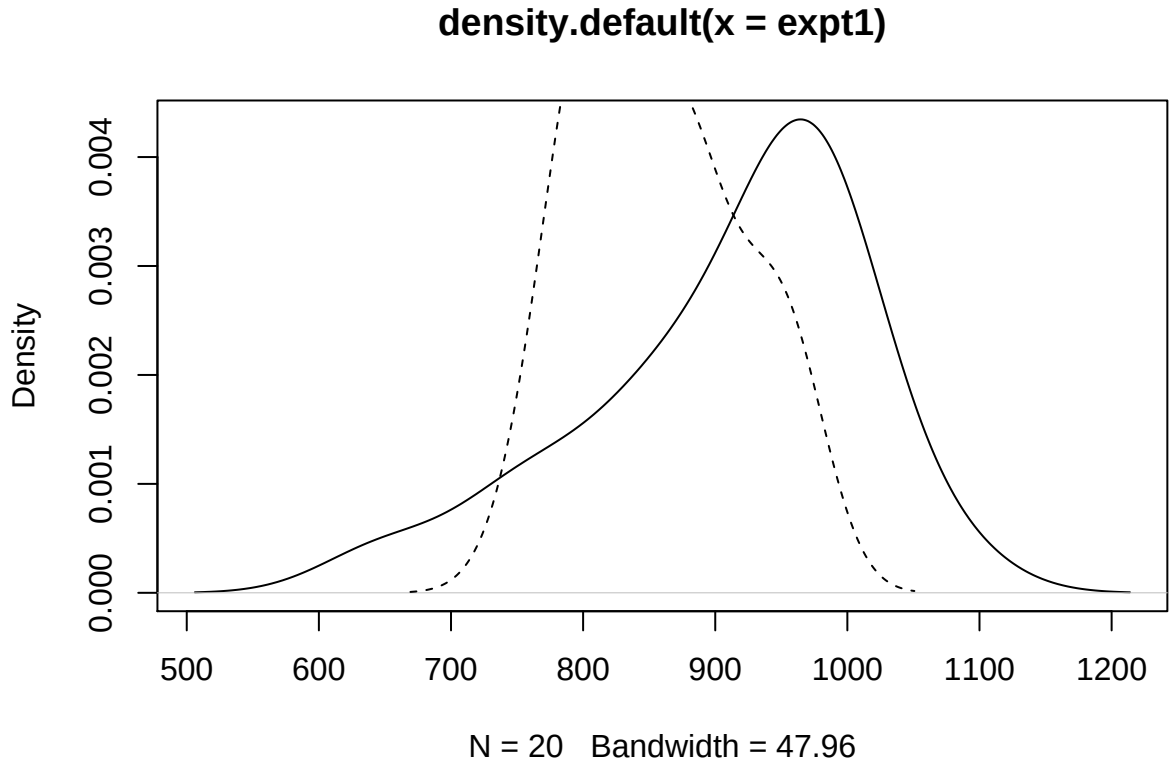
```
##
## Attaching package: 'Hmisc'
```

```
## The following objects are masked from 'package:base':
##
##     format.pval, units

##
## Attaching package: 'UsingR'

## The following object is masked from 'package:survival':
##
##     cancer
```

```
str(michelson)
```

```
## 'data.frame':    100 obs. of  3 variables:
##  $ Speed: int  850 740 900 1070 930 850 950 980 980 880 ...
##  $ Run  : Factor w/ 20 levels "1","2","3","4",..: 1 2 3 4 5 6 7 8 9 10 ...
##  $ Expt : Factor w/ 5 levels "1","2","3","4",..: 1 1 1 1 1 1 1 1 1 1 ...
```

```
len_split <- with(michelson, split(Speed, Expt))
expt1 <- len_split$"1"
expt2 <- len_split$"2"
plot(density(expt1), lty= 1)
lines(density(expt2), lty=2)
```



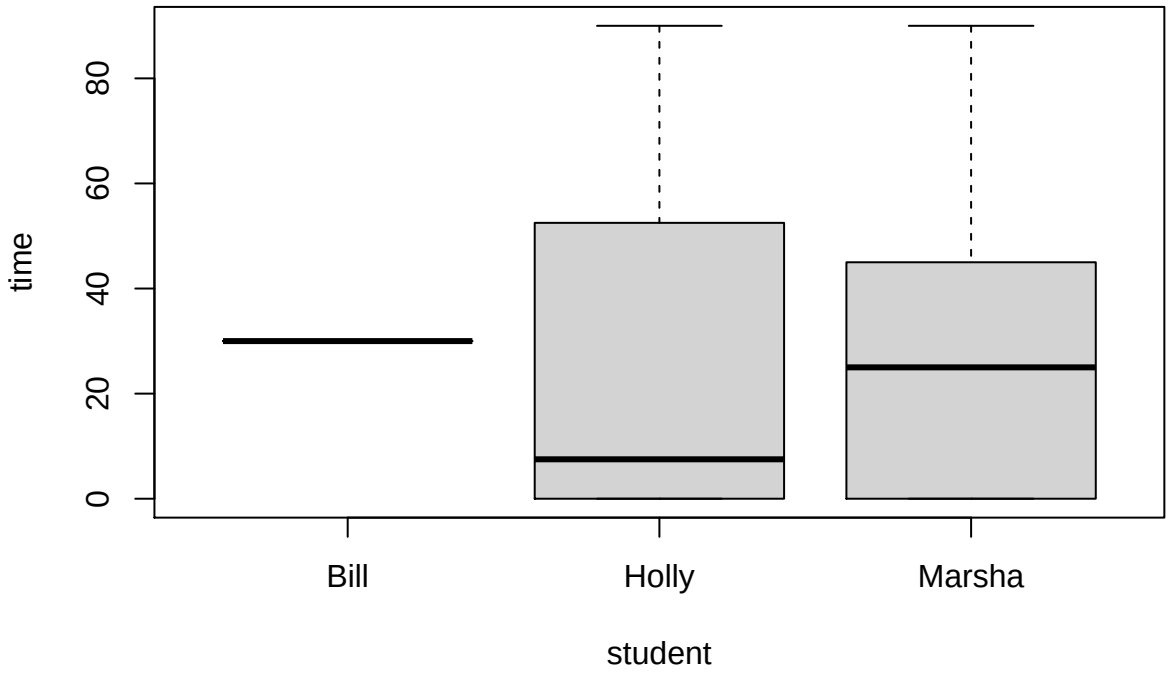
Problem 2 (Verzani problem 3.4)

Three students record the time spent on homework per class. Their data is:

Student	1	2	3	4	5
Marsha	25	0	45	90	0
Bill	30	30	30	30	
Holly	15	0	90	0	

Use a list to store these values. Then create a boxplot to compare. (You must use `boxplot()`*'s formula interface for this problem.)*

```
# Your code here
times <- c(25, 0, 45, 90, 0, 30, 30, 30, 30, 15, 0, 90, 0)
students <- rep(c("Marsha", "Bill", "Holly"), times=c(5, 4, 4))
theData <- list(time = times, student = students)
boxplot(time ~ student, data = theData)
```



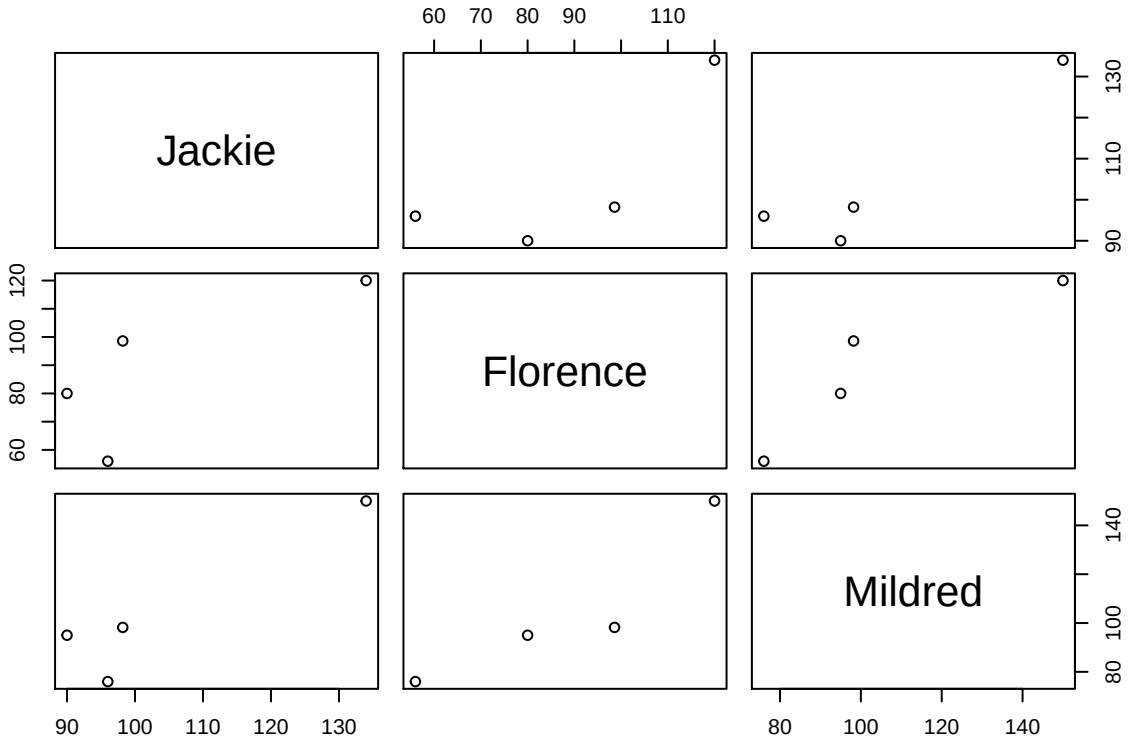
Problem 3 (Verzani problem 3.5)

A group of nursing students take turns measuring some basic assessments. Their data is:

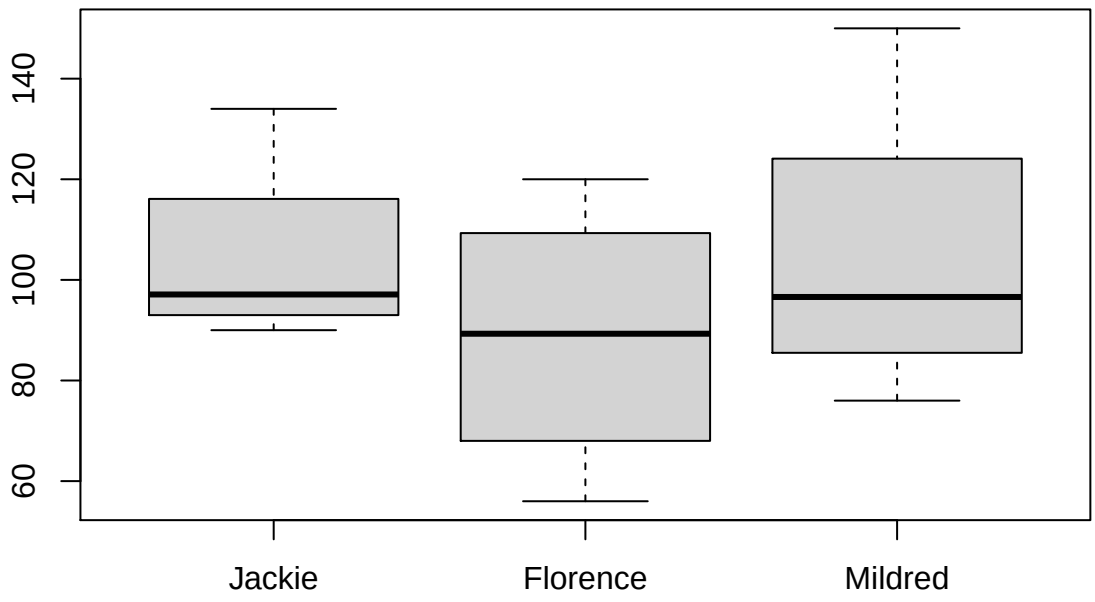
	Temp	Pulse	Systolic	Diastolic
Jackie	98.2	96	134	90
Florence	98.6	56	120	80
Mildred	98.2	76	150	95

Create a data frame of these values. Will `plot()` *and* `boxplot()` *produce the same graphic?*

```
# Your code here
Jackie <- c(98.2, 96, 134, 90)
Florence <- c(98.6, 56, 120, 80)
Mildred <- c(98.2, 76, 150, 95)
theData <- data.frame(Jackie, Florence, Mildred)
plot(theData)
```




```
boxplot(theData)
```



Problem 4 (Verzani problem 3.8)

The second argument to `split` *can be a list of factors. The result is that all interactions (possible combinations) are used for the groups. In the* `ToothGrowth` *data set, growth (*`len`*) is measured for two types of supplements (*`supp`*) and three doses (*`dose`*). Split this* `len` *value into 6 groups.*

```
# Your code here
str(ToothGrowth)
```

```
## 'data.frame':    60 obs. of  3 variables:
##  $ len : num  4.2 11.5 7.3 5.8 6.4 10 11.2 11.2 5.2 7 ...
##  $ supp: Factor w/ 2 levels "OJ","VC": 2 2 2 2 2 2 2 2 2 2 ...
##  $ dose: num  0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 ...
```

```
len <- ToothGrowth$len
supp <- ToothGrowth$supp
dose <- ToothGrowth$dose
split(len, list(supp, dose))
```

```
## $OJ.0.5
##  [1] 15.2 21.5 17.6  9.7 14.5 10.0  8.2  9.4 16.5  9.7
##
## $VC.0.5
##  [1]  4.2 11.5  7.3  5.8  6.4 10.0 11.2 11.2  5.2  7.0
```

```
##
## $OJ.1
##  [1] 19.7 23.3 23.6 26.4 20.0 25.2 25.8 21.2 14.5 27.3
##
## $VC.1
##  [1] 16.5 16.5 15.2 17.3 22.5 17.3 13.6 14.5 18.8 15.5
##
## $OJ.2
##  [1] 25.5 26.4 22.4 24.5 24.8 30.9 26.4 27.3 29.4 23.0
##
## $VC.2
##  [1] 23.6 18.5 33.9 25.5 26.4 32.5 26.7 21.5 23.3 29.5
```