Practical

K MWai

Measures of Data

Exercise. Q1

The lengths of time, in minutes, that 10 patients waited in a doctor's office before receiving treatment were recorded as follows: 5, 11, 9, 5, 10, 15, 6, 10, 5, and 10. Treating the data as a random sample.

Find
(a) the mean;
(b) the median;
(c) the mode;
(d) the range;
(e) the standard deviation.

Exercise. Q2

In the 2014-15 rugby season, Kemri University had the following score differences for the 13 games it played: 11 49 32 3 6 38 38 30 8 40 31 5 36.

Find
(a) the mean score difference;
(b) the median score difference.

Solutions. Q1

```
time<-c(5, 11, 9, 5, 10, 15, 6, 10, 5,10)
# a) mean
mean(time)
```

```
[1] 8.6
```

```
# b) median
median(time)
```

```
[1] 9.5
```

```
# c) mode
sort(table(time))
```

```
time
 6  9 11 15  5 10
 1  1  1  1  3  3
```

Solutions. Q1

```
# d) range
range(time)
```

```
[1]  5 15
```

```
# e) sd
sd(time)
```

```
[1] 3.306559
```

Solutions. Q2

```
rugby<-c(11,49,32,3,6,38,38,30,8,40,31,5,36)
# a) mean
mean(rugby)
```

```
[1] 25.15385
```

```
# b) median
median(rugby)
```

```
[1] 31
```

```
# c) mode
sort(table(rugby))
```

```
rugby
 3  5  6  8 11 30 31 32 36 40 49 38
 1  1  1  1  1  1  1  1  1  1  1  2
```

Solutions. Q2

```r
# d) range
range(rugby)
```

```
[1]  3 49
```

```r
# e) sd
sd(rugby)
```

```
[1] 16.07195
```

Graphical Exploration

Exercise. 1

Draw a box plot to show the distribution of the birth weight(bweight) for the different age groups (agegrp).

- Label the titles i.e y, x, and the main title
- Change the color of the titles from the default black to a color of your choice.
- Increase the size of axis labels by 20%, main label by 35%
- y scale to start from 500 to 5000 grams
- Get the median birthweight for the age categories
- save the graph as a .pdf file to a location of your choice

Exercise. 2

Draw a Grouped bar plot showing the number of kids in each category of lbw grouping them by sex.

- Label the titles i.e y, x, and the main title
- Change the color of the titles from the default black to a color of your choice.
- Increase the size of axis labels by 20%, main label by 35%
- Get the median birthweight for the age categories
- save the graph as a .png file to a location of your choice

Solution 1

```
library(foreign)
birth<-read.csv("data/birthweight2.csv")
attach(birth)
```

```
pdf("soln1.pdf")

boxplot(bweight~agegrp,las=1,main="Birth weight per age group",
    ylab="Birth weight(g)",ylim=c(500,5000),col.lab="darkgreen",
    col.main="red",xlab="Age group",cex.lab=1.2,cex.main=1.35)

dev.off()
```

Solution 1 ...


Birth weight per age group
Birth weight(g)
5000
4000
3000
2000
1000
20−29 yrs
30−34 yrs
35−39 yrs
40+yrs
Age group

```
tapply(bweight,agegrp,median)
```

```
20-29 yrs 30-34 yrs 35-39 yrs     40+yrs
     3194      3200      3209      3130
```

Solution 2

	Female	Male
Normal 2500+	270	291
Weight<2500	45	35

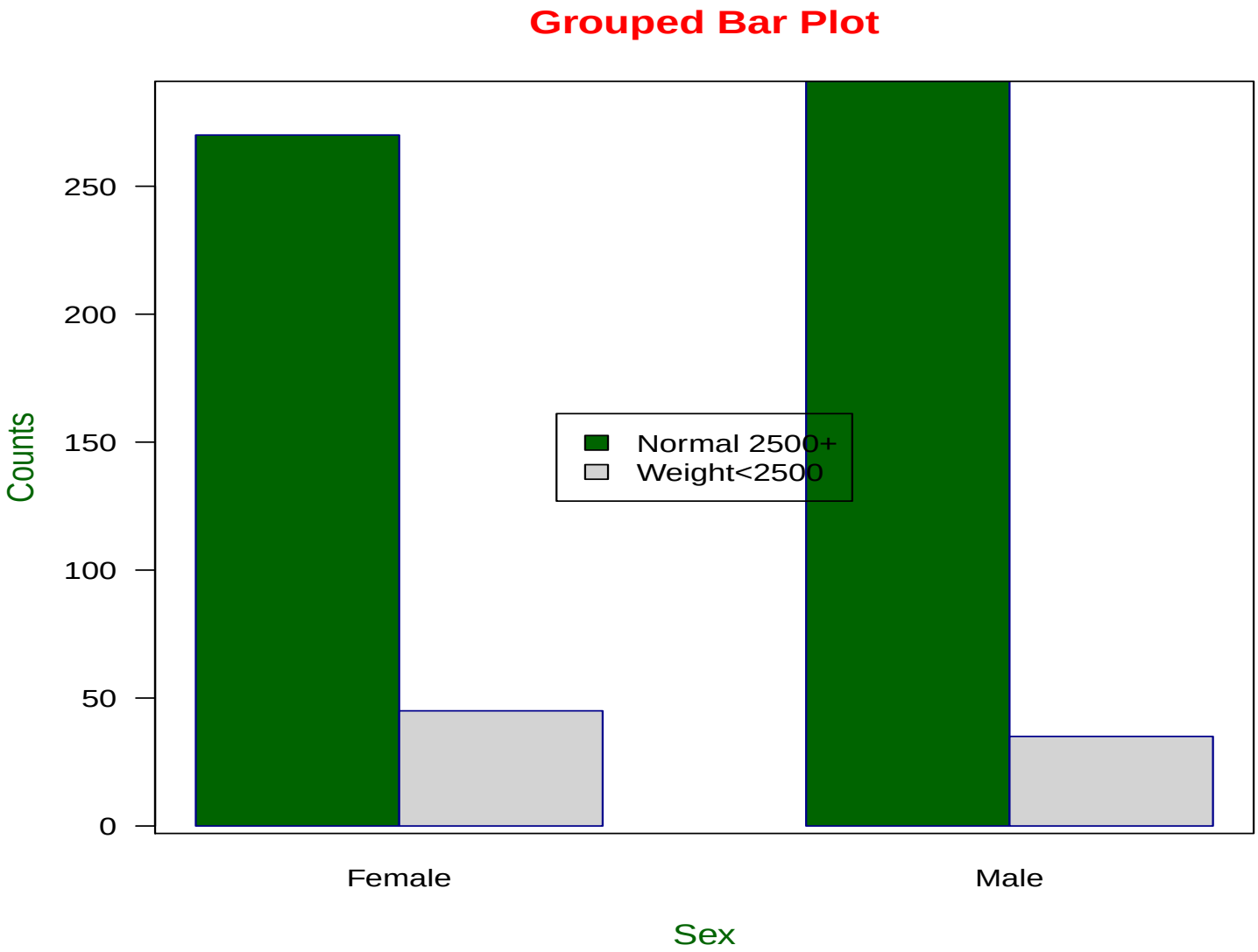
Solution 2

```
pdf("soln2.png")

barplot(tabs,las=1,beside = T, main="Grouped Bar Plot",
        xlab="Sex",ylab="Counts", border="darkblue",
        col=c("darkgreen","lightgrey"),cex.lab=1.2,
        cex.main=1.35,col.lab="darkgreen",col.main="red")
legend("center",legend=(rownames(tabs)),
       fill=c("darkgreen","lightgrey"))
box()

dev.off()
```

Solution 2 . . .


Grouped Bar Plot
Counts
250
200
150
100
50
0
Normal 2500+
Weight<2500
Female
Male
Sex