

## Class 3, Homework Solutions

**Question 1 (2 points).** Create a vector with 10 values. The first part of these values needs to be 'Nov' (for November), the last part of these values needs to be 15 to 24, and these two parts need to be separated by '\_'. Extract the numbers from these values.

```
a <- paste('Nov', 15:24, sep='_')
a

## [1] "Nov_15" "Nov_16" "Nov_17" "Nov_18" "Nov_19" "Nov_20" "Nov_21"
## [8] "Nov_22" "Nov_23" "Nov_24"

substr(a, start=5, stop=7)

## [1] "15" "16" "17" "18" "19" "20" "21" "22" "23" "24"
```

**Question 2 (2 points).** Use the vector created in question 1. Select the second and the fourth values of this vector. Change the last five values to 'Dec/1' to 'Dec/5'. Extract the month from this vector. Select values from the month of November.

```
a[c(2,4)]

## [1] "Nov_16" "Nov_18"

a[6:10] <- paste('Dec', 1:5, sep='/')
a

## [1] "Nov_15" "Nov_16" "Nov_17" "Nov_18" "Nov_19" "Dec/1" "Dec/2"
## [8] "Dec/3" "Dec/4" "Dec/5"

month <- substr(a, start=1, stop=3)
month

## [1] "Nov" "Nov" "Nov" "Nov" "Nov" "Dec" "Dec" "Dec" "Dec" "Dec"

a[which(month == 'Nov')]

## [1] "Nov_15" "Nov_16" "Nov_17" "Nov_18" "Nov_19"
```

**Question 3 (2 points).** Create a matrix with numbers from 1 to 12, 3 rows and 4 columns. Change the values in the second row and first column to 100. Change the values in the last column to -1, 0, and 1. Remove the second and third columns.

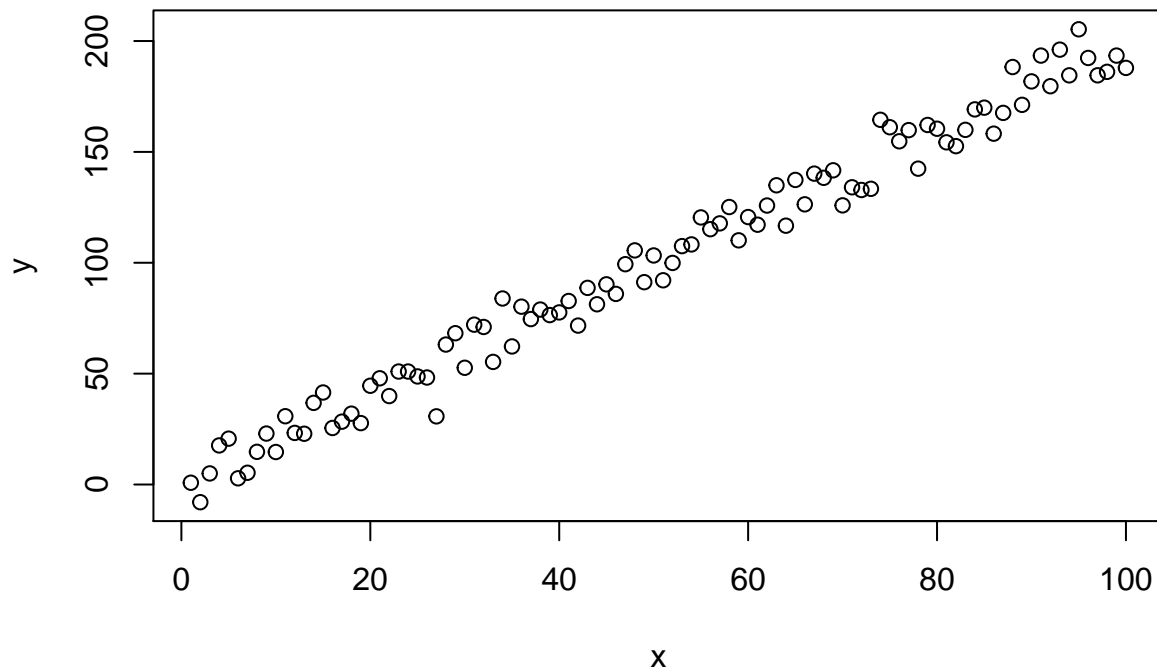
```
mat <- matrix(1:12, nrow=3, ncol=4)
mat[2,1] <- 100
mat[,4] <- -1:1
mat[,-c(2,3)]
```

```
##      [,1] [,2]
## [1,]    1  -1
## [2,]   100   0
## [3,]    3   1
```

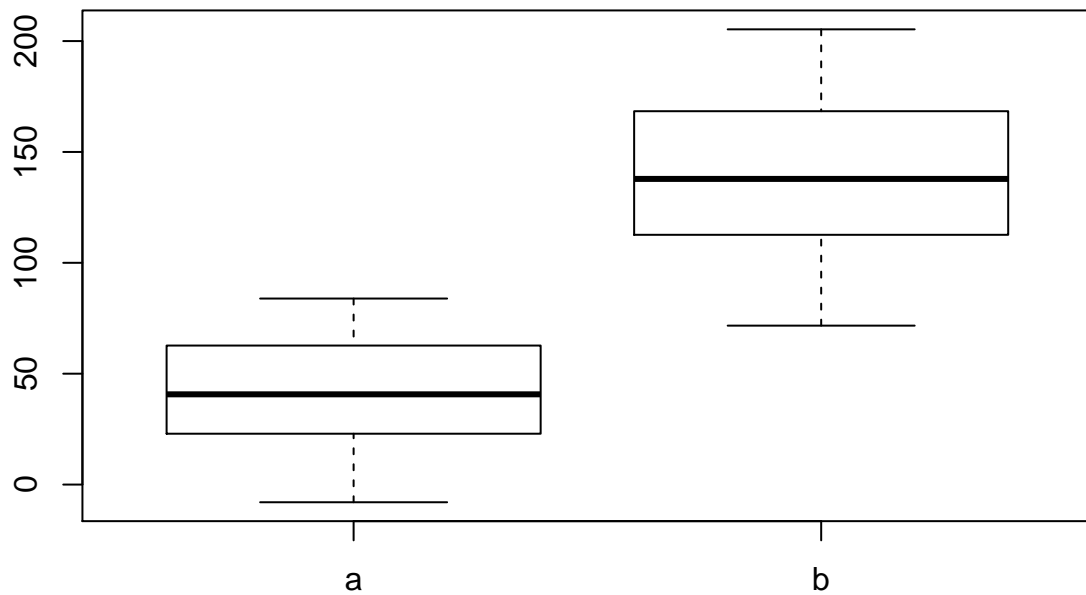
Question 4 (2 points). Use the code below to generate some random values. Create a scatter plot of y against x. Create a box plot of y against z.

```
x <- 1:100
y <- x * 2 + rnorm(100, 0, 10)
z <- c(rep('a',40), rep('b',60))
```

```
plot(y ~ x)
```

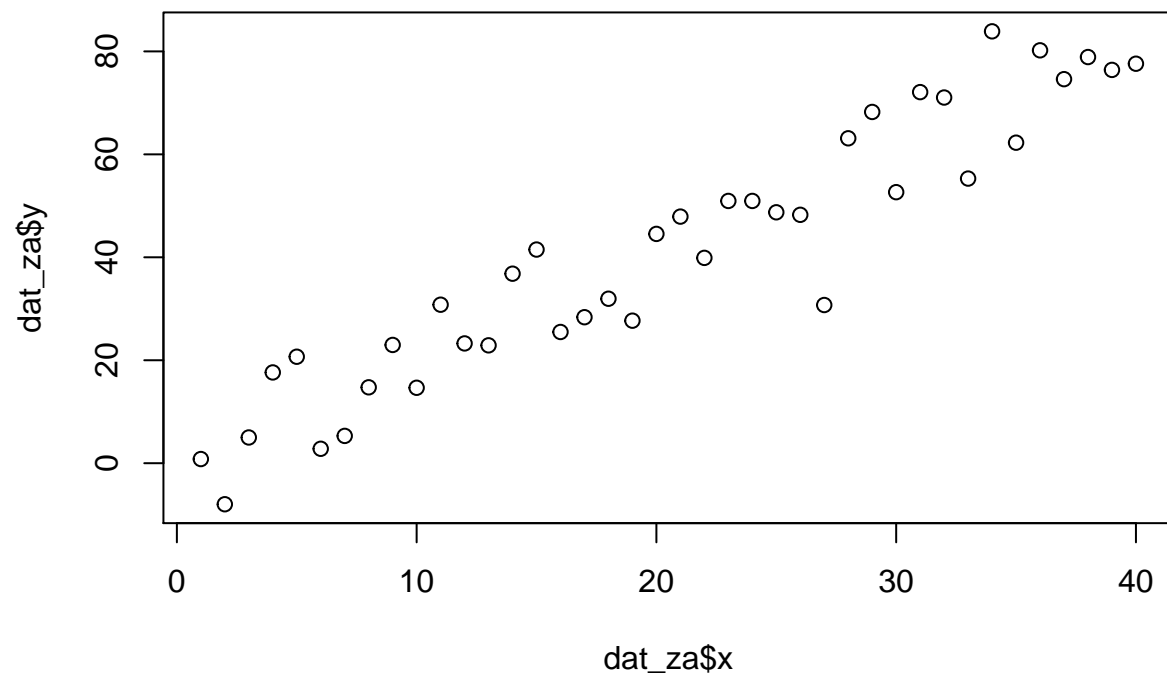


```
boxplot(y ~ z)
```

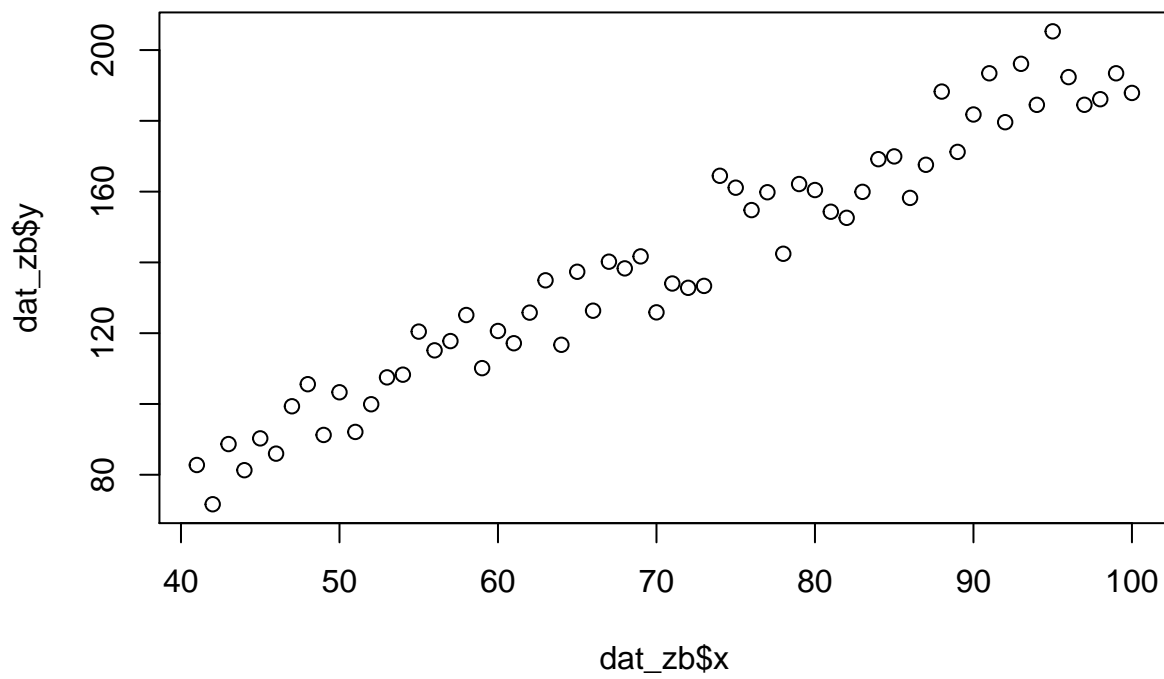


Question 5 (2 points). Create scatter plots of y against x for z values of 'a' and 'b' separately. Create a boxplot of y against z for observations with x values greater than 20.

```
dat <- data.frame(x=x, y=y, z=z)
dat_za <- dat[which(dat$z == 'a'),]
dat_zb <- dat[which(dat$z == 'b'),]
dat_largex <- dat[which(dat$x > 20),]
plot(dat_za$y ~ dat_za$x)
```



```
plot(dat_zb$y ~ dat_zb$x)
```



```
boxplot(dat_largex$y ~ dat_largex$z)
```

