Homework 2

Akhil Havaldar (ash2sfp)

Problem 1

```
#a)
days <- c("Monday", "Tuesday", "Wednesday", "Thursday", "Friday")
commutes <- matrix(c(25,24,36,27,21,36,34,33,25,32), nrow=5, ncol=2, byrow=TRUE)
print(commutes)
```

```
##      [,1] [,2]
## [1,]   25   24
## [2,]   36   27
## [3,]   21   36
## [4,]   34   33
## [5,]   25   32
```

```
#b)
rownames(commutes) <- days
colnames(commutes) <- c('Week1', 'Week2')
print(commutes)
```

```
##           Week1 Week2
## Monday       25    24
## Tuesday      36    27
## Wednesday    21    36
## Thursday     34    33
## Friday       25    32
```

```
#c)
new <- ifelse(commutes[,2] < commutes[,1], "faster", "not")
print(new)
```

```
##    Monday   Tuesday Wednesday  Thursday    Friday
##  "faster"  "faster"     "not"  "faster"     "not"
```

```r
#d)
print(apply(commutes, 1, mean))
```

```
##    Monday   Tuesday Wednesday  Thursday    Friday
##      24.5      31.5      28.5      33.5      28.5
```

```r
#e)
diff <- commutes - 30
print(diff)
```

```
##           Week1 Week2
## Monday       -5    -6
## Tuesday       6    -3
## Wednesday    -9     6
## Thursday      4     3
## Friday       -5     2
```

```r
#f)
print(apply(diff, 2, mean))
```

```
## Week1 Week2
##  -1.8   0.4
```

```r
#g)
print(apply(diff, 2, max))
```

```
## Week1 Week2
##     6     6
```

```r
#h)
temp <- which(commutes[,2]<25)
temp <- rownames(commutes)[temp]
temp
```

```
## [1] "Monday"
```

```r
#i)
temp2 <- commutes[,1:2]<=30
print(apply(temp2, 2, sum))
```

```
## Week1 Week2
##     3     2
```

```r
#j)
j <- which(commutes[,1] == min(commutes[,1]))
d <- rownames(commutes)[j]
print(d)
```

```
## [1] "Wednesday"
```

```r
#k)
k <- which((diff[,1] * diff[,2])>0)
temp3 <- diff[k,]
print(temp3)
```

```
##           Week1 Week2
## Monday       -5    -6
## Thursday      4     3
```

Question 2

```r
library(car)
```

```
## Loading required package: carData
```

```r
#a

weight.metric <- Davis[,c(2,4)]
head(weight.metric)
```

```
##   weight repwt
## 1     77    77
## 2     58    51
## 3     53    54
## 4     68    70
## 5     59    59
## 6     76    76
```

```r
#b

weight.imp <- weight.metric*2.2
head(weight.imp)
```

```
##   weight repwt
## 1  169.4 169.4
## 2  127.6 112.2
## 3  116.6 118.8
## 4  149.6 154.0
## 5  129.8 129.8
## 6  167.2 167.2
```

```
#c

height.metric <- Davis[,c(3,5)]
head(height.metric)
```

```
##   height repht
## 1    182   180
## 2    161   159
## 3    161   158
## 4    177   175
## 5    157   155
## 6    170   165
```

```
#d

height.imp <- round(height.metric/2.54,1)
head(height.imp)
```

```
##   height repht
## 1   71.7  70.9
## 2   63.4  62.6
## 3   63.4  62.2
## 4   69.7  68.9
## 5   61.8  61.0
## 6   66.9  65.0
```

```
#e
sex <- Davis$sex
Davis.imp <- cbind(sex, weight.imp, height.imp)
colnames(Davis.imp)<- c("sex", "rec.weight", "rep.weight", "rec.height", "rep.height")
head(Davis.imp)
```

```
##   sex rec.weight rep.weight rec.height rep.height
## 1   M      169.4      169.4       71.7       70.9
```

```
## 2   F      127.6      112.2       63.4       62.6
## 3   F      116.6      118.8       63.4       62.2
## 4   M      149.6      154.0       69.7       68.9
## 5   F      129.8      129.8       61.8       61.0
## 6   M      167.2      167.2       66.9       65.0
```

```
#f)
print(colSums(is.na(Davis.imp)))
```

```
##        sex rec.weight rep.weight rec.height rep.height
##          0          0         17          0         17
```

```
#g
sum(!complete.cases(Davis.imp))
```

```
## [1] 19
```

```
#h)
df <- Davis.imp[rowSums(is.na(Davis.imp)) > 0,]
df <- df$sex
print(df)
```

```
##  [1] M F M F F F M F F F F F F F M F F M M
## Levels: F M
```

Question 3

```
#a)
planet <- data.frame(name = c("Mercury", "Venus", "Earth", "Mars", "Jupiter", "Saturn",
)
print(planet)
```

```
##      name distance        type diameter rotation rings moons
## 1 Mercury     0.39 Terrestrial    0.382    58.64    No     0
## 2   Venus     0.72 Terrestrial    0.949  -243.02    No     0
## 3   Earth     1.00 Terrestrial    1.000     1.00    No     1
## 4    Mars     1.52 Terrestrial    0.532     1.03    No    2+
## 5 Jupiter     5.20         Gas   11.209     0.41   Yes    2+
## 6  Saturn     9.54         Gas    9.449     0.43   Yes    2+
## 7  Uranus    19.18         Gas    4.007    -0.72   Yes    2+
## 8 Neptune    30.06         Gas    3.883     0.67   Yes    2+
```

```r
#b
bsub <- planet[which(planet$diameter < 5 & planet$diameter!=1),]
print(bsub)
```

```
##      name distance        type diameter rotation rings moons
## 1 Mercury     0.39 Terrestrial    0.382    58.64    No     0
## 2   Venus     0.72 Terrestrial    0.949  -243.02    No     0
## 4    Mars     1.52 Terrestrial    0.532     1.03    No    2+
## 7  Uranus    19.18         Gas    4.007    -0.72   Yes    2+
## 8 Neptune    30.06         Gas    3.883     0.67   Yes    2+
```

```r
#c)
csub <- planet[which(planet$rotation > 0 & planet$rotation!=1), 'distance']
print(csub)
```

```
## [1]  0.39  1.52  5.20  9.54 30.06
```

```r
# or this to include names
csub2 <- planet[which(planet$rotation > 0 & planet$rotation!=1), c("name",'distance')]
print(csub2)
```

```
##      name distance
## 1 Mercury     0.39
## 4    Mars     1.52
## 5 Jupiter     5.20
## 6  Saturn     9.54
## 8 Neptune    30.06
```

```r
#d)
dsub <- planet[which(planet$diameter > 1), c("name", "moons", "type")]
print(dsub)
```

```
##      name moons type
## 5 Jupiter    2+  Gas
## 6  Saturn    2+  Gas
## 7  Uranus    2+  Gas
## 8 Neptune    2+  Gas
```

```r
#e)
esub <- planet[which(planet$moons == "2+"), c("rings", "type")]
print(esub)
```

```
##   rings        type
## 4    No Terrestrial
## 5   Yes         Gas
## 6   Yes         Gas
## 7   Yes         Gas
## 8   Yes         Gas
```