Intro to R Programming: Class Test - Solutions

Task 1

1.

```
houseprices <- read.csv("houseprices.csv")
```

2.

```
mean(subset(houseprices,Month == 8)$Price)
```

```
## [1] 150727.7
```

3.

```
houseprices.summer <- subset(houseprices, (Month == 7 & Day >= 15) | (Month == 8 & Day <= 15 ))
nrow(houseprices.summer)
```

```
## [1] 1917
```

4.

```
houseprices[which.min(houseprices$Price),]
```

```
##     Day Month                                              Address
## 727   2     7 24 Ancroft Street, Glasgow, Glasgow City G20 7HU, UK
##           Lon      Lat Price
## 727 -4.267542 55.87717     1
```

5.

```
houseprices$Lon <- houseprices$Lon* pi /180
houseprices$Lat <- houseprices$Lat* pi /180
```

6.

```
Lambda1 <- -4.2886 / 180 * pi
Phi1 <- 55.8711  / 180 * pi
DeltaLambda <- houseprices$Lon- Lambda1
DeltaPhi <- houseprices$Lat - Phi1
alpha <- sin(DeltaPhi/2)^2 + cos(Phi1)*cos(houseprices$Lat)*sin(DeltaLambda/2)^2
Dist2University <- 12742 * atan2(sqrt(alpha),sqrt(1-alpha))
```

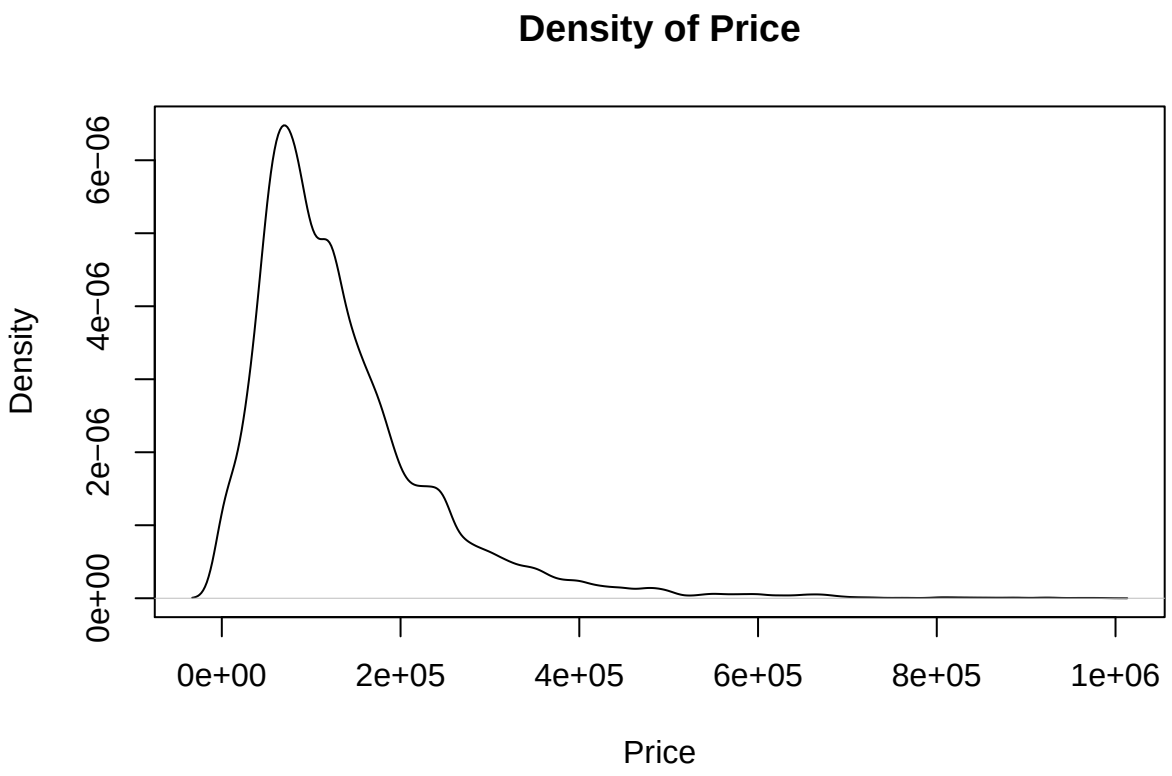
7.

```
mean(subset(houseprices,Dist2University<= 1)$Price)
```

```
## [1] 257308.4
```

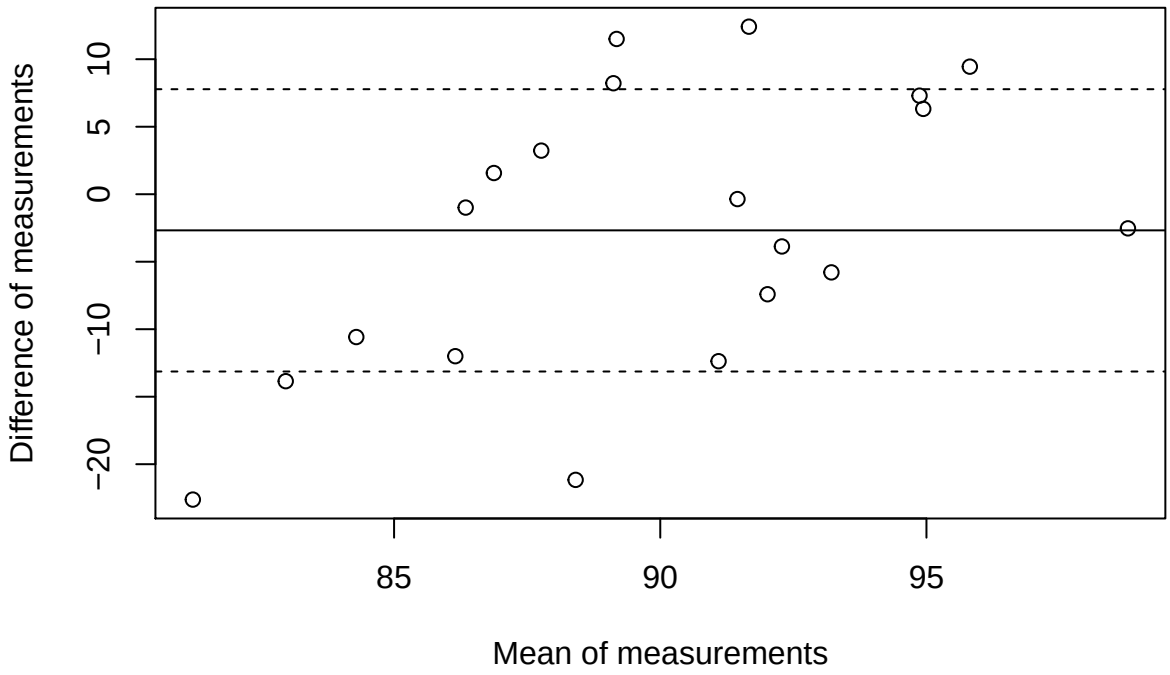
8.

```
plot(density(subset(houseprices,Price < 1000000)$Price),main="Density of Price", xlab="Price")
```



Task 2

```
# 1
hearth <- read.table("hearth.txt",header = TRUE, na.strings = ";")
# 2
hearth <- na.omit(hearth)
# 3
hearth$difference <- hearth$MF - hearth$SV
hearth$mean <- (hearth$MF + hearth$SV)/2
# 4
plot(hearth$mean,hearth$difference, xlab="Mean of measurements", ylab = "Difference of measurements")
# 5
abline(h=mean(hearth$difference))
abline(h=mean(hearth$difference)+sd(hearth$difference),lty=2)
abline(h=mean(hearth$difference)-sd(hearth$difference),lty=2)
```



Task 3

1.

```
potus <- read.table("potus.txt",header=TRUE, sep = ",")
```

2.

```
nrow(subset(potus, State="Texas"))
```

```
## [1] 3179
```

3.

```
mean(subset(potus,VotesTrump>=3*VotesClinton)$HIncome)
```

```
## [1] 43036.53
```

4.

```
sum(subset(potus,State=="California")$VotesClinton)
```

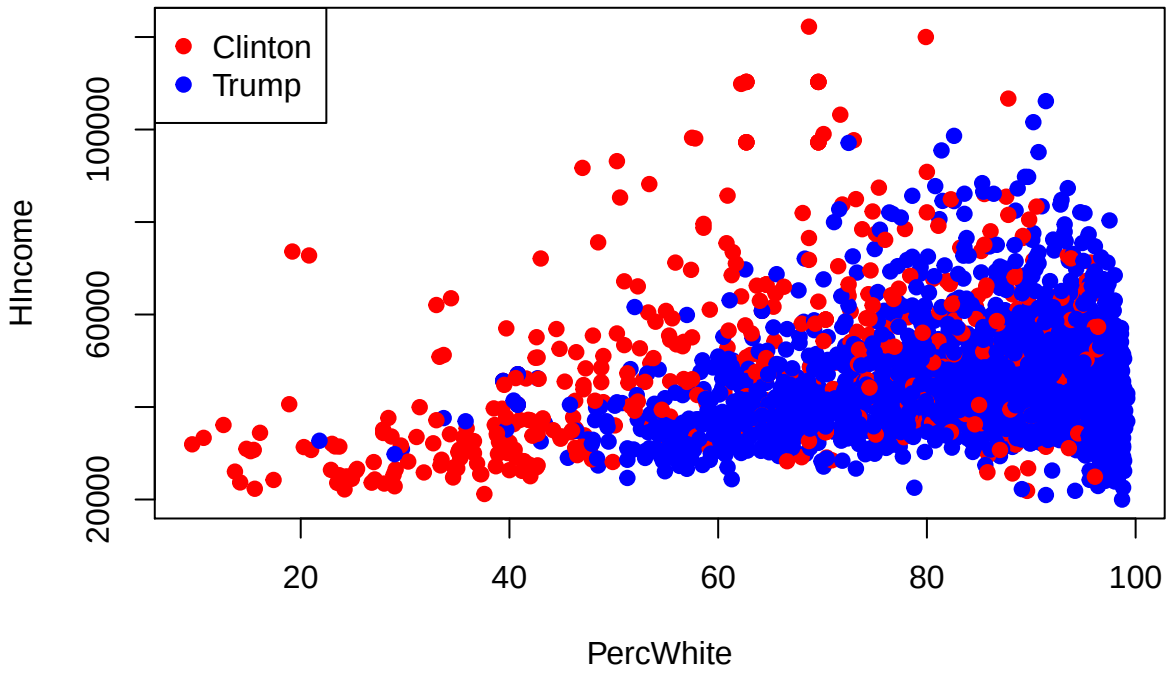
```
## [1] 5482166
```

5.

```
potus$Hillary.Wins <- potus$VotesClinton > potus$VotesTrump
```

6. (and 7)

```
mycols <- c("blue", "red")
plot(HIncome~PercWhite, data=potus,col=mycols[unclass(as.factor(Hillary.Wins))],pch=19)
legend("topleft", pch=19, col=c("red", "blue"), legend = c("Clinton", "Trump"))
```


Clinton
Trump
HIncome
20000
60000
100000
20
40
60
80
100
PercWhite