HW1

113078506

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Q1: What is the 5th element in the original list of ages?

```
customers <- read.table(file = "customers.txt", header = TRUE)
customers$age[5]
```

```
## [1] 45
```

Q2: What is the fifth lowest age?

```
sorted_ages <- sort(customers$age)
sorted_unique_ages <- unique(sorted_ages)
sorted_unique_ages[5]
```

```
## [1] 22
```

Q3: Extract the five lowest ages together

```
sorted_unique_ages[1:5]
```

```
## [1] 18 19 20 21 22
```

Q4: Get the five highest ages by first sorting them in decreasing order first.

```
?sort
desc_ages <- sort(sorted_unique_ages, decreasing = TRUE)
desc_ages[1:5]
```

```
## [1] 85 83 82 81 80
```

##Q5: What is the average (mean) age?

```r
ages_mean <- mean(sorted_ages)
ages_mean
```

```
## [1] 46.80702
```

##Q6: What is the standard deviation of ages?

```r
sd(sorted_ages)
```

```
## [1] 16.3698
```

##Q7: Make a new variable called age_diff, with the difference between each age and the mean age

```r
age_diff <- sorted_ages - ages_mean
age_diff
```

```
##   [1] -28.8070175 -27.8070175 -27.8070175 -27.8070175 -27.8070175 -27.8070175
##   [7] -27.8070175 -27.8070175 -27.8070175 -26.8070175 -26.8070175 -26.8070175
##  [13] -26.8070175 -26.8070175 -25.8070175 -25.8070175 -25.8070175 -25.8070175
##  [19] -25.8070175 -25.8070175 -25.8070175 -24.8070175 -24.8070175 -23.8070175
##  [25] -23.8070175 -23.8070175 -23.8070175 -23.8070175 -23.8070175 -22.8070175
##  [31] -22.8070175 -22.8070175 -21.8070175 -21.8070175 -21.8070175 -21.8070175
##  [37] -21.8070175 -21.8070175 -21.8070175 -20.8070175 -20.8070175 -20.8070175
##  [43] -20.8070175 -20.8070175 -20.8070175 -20.8070175 -20.8070175 -20.8070175
##  [49] -19.8070175 -19.8070175 -19.8070175 -19.8070175 -19.8070175 -18.8070175
##  [55] -18.8070175 -18.8070175 -18.8070175 -18.8070175 -17.8070175 -17.8070175
##  [61] -17.8070175 -17.8070175 -17.8070175 -17.8070175 -16.8070175 -16.8070175
##  [67] -16.8070175 -16.8070175 -16.8070175 -16.8070175 -16.8070175 -16.8070175
##  [73] -15.8070175 -15.8070175 -15.8070175 -15.8070175 -15.8070175 -15.8070175
##  [79] -15.8070175 -15.8070175 -14.8070175 -14.8070175 -14.8070175 -14.8070175
##  [85] -14.8070175 -14.8070175 -14.8070175 -14.8070175 -13.8070175 -13.8070175
##  [91] -13.8070175 -13.8070175 -13.8070175 -12.8070175 -12.8070175 -12.8070175
##  [97] -12.8070175 -12.8070175 -12.8070175 -12.8070175 -12.8070175 -12.8070175
## [103] -11.8070175 -11.8070175 -11.8070175 -11.8070175 -11.8070175 -11.8070175
## [109] -10.8070175 -10.8070175 -10.8070175 -10.8070175 -10.8070175  -9.8070175
## [115]  -9.8070175  -9.8070175  -9.8070175  -9.8070175  -9.8070175  -9.8070175
## [121]  -9.8070175  -8.8070175  -8.8070175  -8.8070175  -8.8070175  -8.8070175
## [127]  -8.8070175  -7.8070175  -7.8070175  -7.8070175  -7.8070175  -7.8070175
## [133]  -6.8070175  -6.8070175  -6.8070175  -6.8070175  -6.8070175  -6.8070175
## [139]  -6.8070175  -5.8070175  -5.8070175  -5.8070175  -5.8070175  -5.8070175
## [145]  -5.8070175  -4.8070175  -4.8070175  -4.8070175  -4.8070175  -4.8070175
## [151]  -4.8070175  -4.8070175  -4.8070175  -3.8070175  -3.8070175  -3.8070175
## [157]  -3.8070175  -3.8070175  -3.8070175  -2.8070175  -2.8070175  -2.8070175
## [163]  -2.8070175  -1.8070175  -1.8070175  -1.8070175  -1.8070175  -1.8070175
## [169]  -1.8070175  -1.8070175  -1.8070175  -1.8070175  -1.8070175  -1.8070175
## [175]  -1.8070175  -1.8070175  -1.8070175  -1.8070175  -1.8070175  -1.8070175
## [181]  -1.8070175  -1.8070175  -1.8070175  -1.8070175  -1.8070175  -0.8070175
## [187]  -0.8070175  -0.8070175  -0.8070175  -0.8070175  -0.8070175  -0.8070175
## [193]  -0.8070175  -0.8070175   0.1929825   0.1929825   0.1929825   0.1929825
## [199]   0.1929825   0.1929825   0.1929825   0.1929825   0.1929825   0.1929825
## [205]   0.1929825   0.1929825   0.1929825   0.1929825   0.1929825   0.1929825
```

```
## [211]   0.1929825   0.1929825   0.1929825   1.1929825   1.1929825   1.1929825
## [217]   1.1929825   1.1929825   1.1929825   1.1929825   1.1929825   1.1929825
## [223]   1.1929825   1.1929825   1.1929825   1.1929825   1.1929825   1.1929825
## [229]   1.1929825   1.1929825   2.1929825   2.1929825   2.1929825   2.1929825
## [235]   2.1929825   2.1929825   2.1929825   2.1929825   2.1929825   2.1929825
## [241]   2.1929825   2.1929825   2.1929825   2.1929825   2.1929825   2.1929825
## [247]   2.1929825   2.1929825   2.1929825   2.1929825   2.1929825   2.1929825
## [253]   2.1929825   2.1929825   2.1929825   2.1929825   2.1929825   2.1929825
## [259]   2.1929825   2.1929825   2.1929825   2.1929825   2.1929825   3.1929825
## [265]   3.1929825   3.1929825   3.1929825   3.1929825   3.1929825   3.1929825
## [271]   3.1929825   3.1929825   3.1929825   3.1929825   3.1929825   3.1929825
## [277]   3.1929825   3.1929825   3.1929825   3.1929825   3.1929825   3.1929825
## [283]   3.1929825   3.1929825   3.1929825   3.1929825   3.1929825   3.1929825
## [289]   3.1929825   3.1929825   4.1929825   4.1929825   4.1929825   4.1929825
## [295]   4.1929825   4.1929825   5.1929825   5.1929825   5.1929825   6.1929825
## [301]   6.1929825   6.1929825   6.1929825   7.1929825   8.1929825   9.1929825
## [307]   9.1929825  10.1929825  10.1929825  10.1929825  10.1929825  11.1929825
## [313]  11.1929825  12.1929825  13.1929825  13.1929825  15.1929825  15.1929825
## [319]  15.1929825  15.1929825  15.1929825  16.1929825  16.1929825  16.1929825
## [325]  17.1929825  17.1929825  18.1929825  19.1929825  20.1929825  20.1929825
## [331]  20.1929825  21.1929825  21.1929825  22.1929825  23.1929825  23.1929825
## [337]  23.1929825  23.1929825  23.1929825  23.1929825  24.1929825  24.1929825
## [343]  24.1929825  24.1929825  24.1929825  24.1929825  25.1929825  25.1929825
## [349]  25.1929825  25.1929825  25.1929825  25.1929825  25.1929825  25.1929825
## [355]  26.1929825  26.1929825  26.1929825  26.1929825  26.1929825  26.1929825
## [361]  26.1929825  26.1929825  27.1929825  27.1929825  27.1929825  27.1929825
## [367]  27.1929825  27.1929825  28.1929825  28.1929825  28.1929825  28.1929825
## [373]  28.1929825  28.1929825  29.1929825  29.1929825  29.1929825  29.1929825
## [379]  29.1929825  29.1929825  30.1929825  30.1929825  30.1929825  30.1929825
## [385]  31.1929825  31.1929825  31.1929825  31.1929825  32.1929825  32.1929825
## [391]  32.1929825  32.1929825  33.1929825  33.1929825  34.1929825  35.1929825
## [397]  35.1929825  36.1929825  38.1929825
```

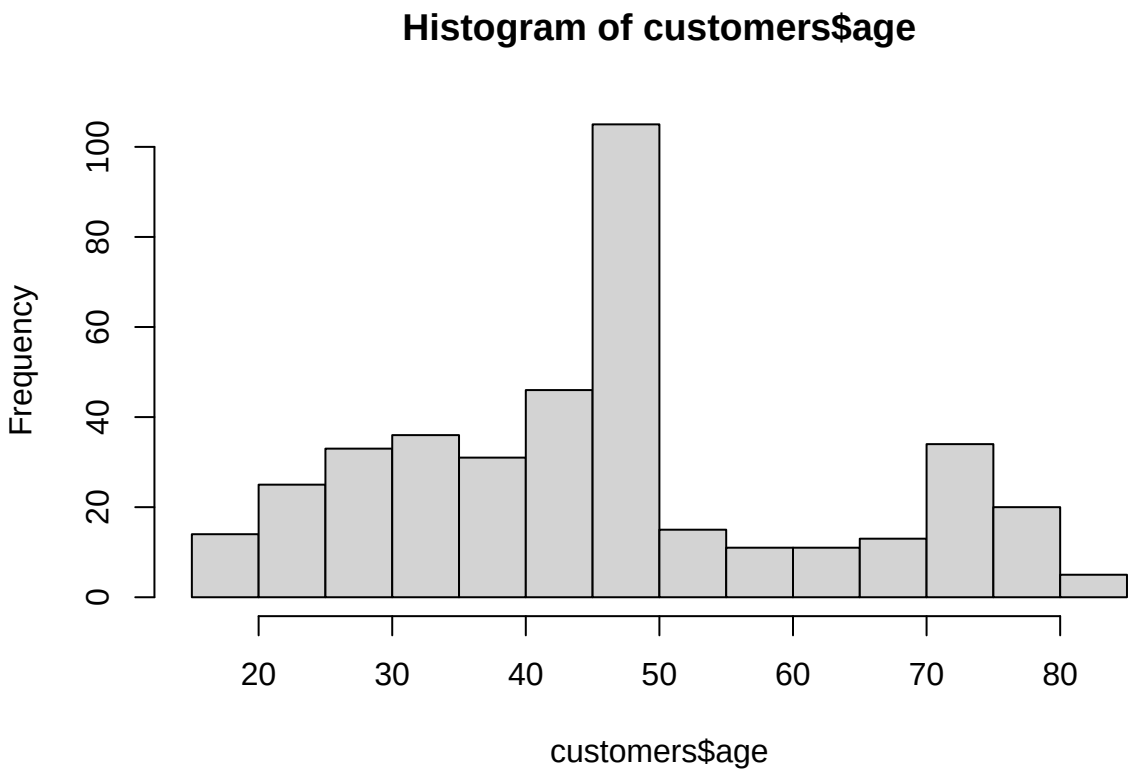
Q8: What is the average "difference between each age and the mean age"?

```
mean(age_diff)
```

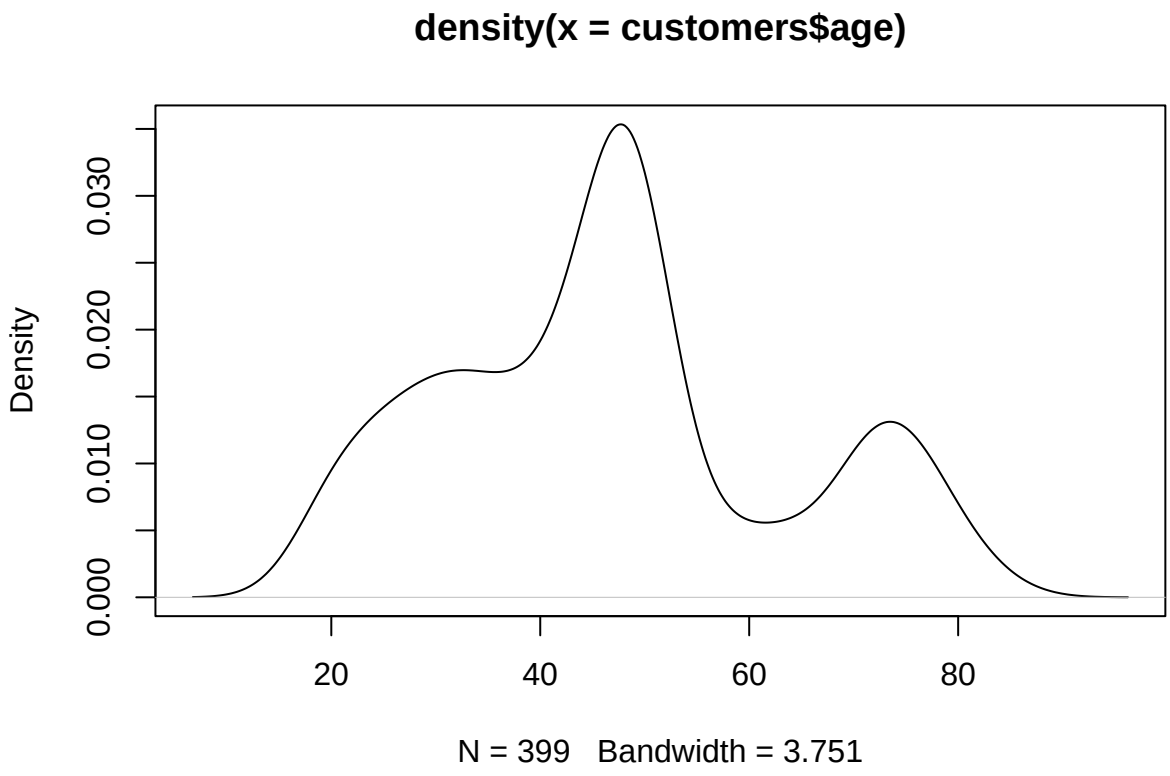
```
## [1] -5.873108e-14
```

Q9: Visualize the raw data as we did in class: (a) histogram, (b) density plot, (c) boxplot+stripchart

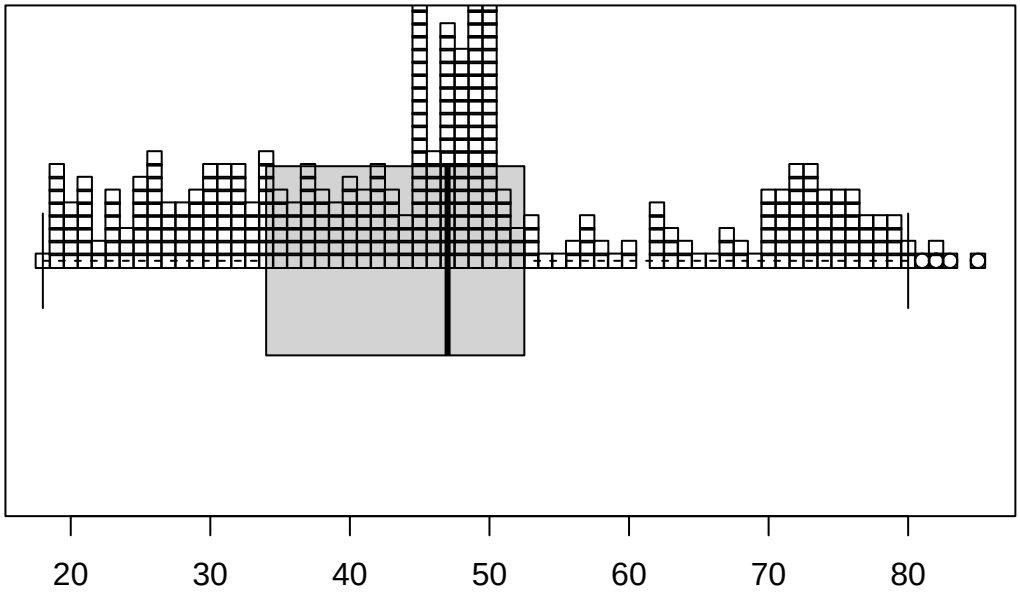
```
hist(customers$age)
```




```
plot(density(customers$age))
```




```r
boxplot(customers$age, horizontal = TRUE)
stripchart(customers$age, method = "stack", add = TRUE)
```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