STA2023 Using R. Answers to Practice 3

Question 1:

```
> scores<-c(588, 563, 357, 341, 526,344, 346, 644, 470, 482)
> mean(scores)
[1] 466.1
```

Question 2:

```
> temp<-c(17, 22, 39, 58, 67, 69, 85)
> median(temp)
[1] 58
> summary(temp)# the data summary also includes the median:
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   17.0    30.5    58.0    51.0    68.0    85.0
```

Question 3:

```
> ages<-c(6, 1, 26, 15, 23, 40, 32, 32)
> median(ages)
[1] 24.5
```

Question 4:

```
> data1<-c(20, 36, 46, 36, 49, 36, 49)
> sort(data1)
[1] 20 36 36 36 46 49 49
> #mode, the most repeated value is 36.
```

Question 5:

```
> data2<-c(49, 52, 52, 52, 74, 67, 55, 55)
> min(data2); max(data2)
[1] 49
[1] 74
> #midrange=(min+max)/2
> (49+74)/2
[1] 61.5
```

Or,

```
> range(data2)
[1] 49 74
> (49+74)/2 # since range function in R yields min, max:
[1] 61.5
```

Question 6:

```
> x<-c(54.5,64.5,74.5,84.5,94.5) # midpoints
> n<-c(6,5,6,11,12) # frequencies or counts
> install.packages("Weighted.Desc.Stat")
> require(Weighted.Desc.Stat) or, you may use: > library(Weighted.Desc.Stat)
> w.mean(x,n)
[1] 79
```

Question 7:

```
> quiz.scores<-c(26, 31, 47, 29, 37, 20, 43, 41, 50, 55, 37, 22)
> range(quiz.scores)
[1] 20 55
> 55-20 # range is equal to max-min:
[1] 35
```

Question 8:

```
> data3<-c(19, 5, 20, 6, 2)
> var(data3)
[1] 71.3
```

Question 9:

```
> data4<-c(18, 18, 14, 11, 8, 8, 10, 17, 12)
> sd(data4)
[1] 4.044887
```

Question 10:

```
> group1<-c(117, 125, 133, 118, 131, 123)
> group2<-c(130, 151, 138, 125, 164, 139)
> mean(group1);sd(group1)
[1] 124.5
[1] 6.565059
> 6.565059/124.5 * 100 # CV =sd/mean * 100
[1] 5.27314
> mean(group2);sd(group2)
[1] 141.1667
[1] 14.27469
> 14.27469/141.1667*100 # CV =sd/mean * 100
[1] 10.11194
```

The variation among men in group 2 (ages 60-69) is twice the variation of men in group1.

Question 11:

```
 > y<-c(54.5,64.5,74.5,84.5,94.5) # midpoints
 > counts<-c(6,6,5,6,17) # frequencies or counts
 > sigma<-w.sd(y,counts) # the function w.sd yields the population standard deviation
 > sigma
 [1] 15.15751
 > n<-sum(counts)
 > n
 [1] 40
 > s<-sigma*sqrt(n/(n-1))# in order to find the sample standard deviation.
 > s # round to one decimal place, the answer is 15.4
 [1] 15.3506
```

Question 12:

```
> pnorm(144,120,12)-pnorm(96,120,12) # pnorm syntax is: pnorm(score,mean,sd)
[1] 0.9544997
```

Question 13:

```
> pnorm(3.7,3.1,0.6)-pnorm(2.5,3.1,0.6)
[1] 0.6826895
```

Question 14:

```
> (177-323)/50  # zscore=(value-mean)/sd
[1] -2.92
> # a negative z score refers to values "below" the mean.
```

Question 15:

```
> data4<-c(51, 34, 47, 67, 66, 62, 36)
> sort(data4)
[1] 34 36 47 51 62 66 67
> 3/7*100 # how many values less than x (51) divided by n (number of data
points)*100
[1] 42.85714
```

Question 16:

```
> data5<-c(49, 52, 52, 52, 74, 67, 55, 55)
> summary(data5)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   49.0    52.0    53.5    57.0    58.0    74.0
```

Question 17:

```
> weights<-c(5.5, 5.7, 5.8, 5.9, 6.1, 6.1, 6.3, 6.4, 6.5, 6.6, 6.7, 6.7, 6.7,
6.9, 7.0, 7.0, 7.0, 7.1, 7.2, 7.2, 7.4, 7.5, 7.7, 7.7, 7.8, 8.0, 8.1, 8.1, 8.
3, 8.7)
> summary(weights)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  5.500   6.425   7.000   6.990   7.650   8.700
> boxplot(weights, horizontal=T)# it corresponds to choice B (median = 7 )
```