Solutions 1

1. The following is some of the relevant S-PLUS output.

```r
> salmon <- c(162,170, ...)
...>
> summary(salmon)
   Min. 1st Qu.  Median    Mean  3rd Qu.     Max.     NA's
 156.00 169.20  176.40 182.80  200.00     200
> v <- var(salmon)
> v
[1] 103.2718
> t.test(salmon)

  One-sample t-test

data:  salmon
  t = 122.7697, df = 49, p-value = 0
  alternative hypothesis: true mean is not equal to 0
  95 percent confidence interval:
  173.5519 179.3281
  sample estimates:
    mean of x
  176.44
  > df <- 49
  > L <- qchisq(0.975, df)
  > L
[1] 70.22241
  > U <- qchisq(0.025, df)
  > U
[1] 31.55492
  > CI <- c(df^v/L, df^v/U)
  > CI
[1] 72.06132 160.36550
```

2. > m <- rep(1:4, rep(10,4))
> method <- factor(m)
> score <- c(33.44, ...)
...
> keyboard <- data.frame(method, score)
> by(score, method, summary)

INDICES: 1

<table>
<thead>
<tr>
<th></th>
<th>Min.</th>
<th>1st Qu.</th>
<th>Median</th>
<th>Mean</th>
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<td>41.80</td>
<td>42.75</td>
<td>46.00</td>
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</tbody>
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> plot(method, score)
An initial inspection of the data shows that Method D gives the most improvement. Its results are also more consistent in that the spread of the data is less than for the other methods. It remains to be seen whether this apparent improvement is statistically significant.

The established method, Method A, gives the second best results. Methods B and C give no improvement over the established method.