

# Chase Darlington\_CA3

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## Load the data

```
data(iris)
```

## Look at the data

```
iris
```

##	Sepal.Length	Sepal.Width	Petal.Length	Petal.Width	Species
## 1	5.1	3.5	1.4	0.2	setosa
## 2	4.9	3.0	1.4	0.2	setosa
## 3	4.7	3.2	1.3	0.2	setosa
## 4	4.6	3.1	1.5	0.2	setosa
## 5	5.0	3.6	1.4	0.2	setosa
## 6	5.4	3.9	1.7	0.4	setosa
## 7	4.6	3.4	1.4	0.3	setosa
## 8	5.0	3.4	1.5	0.2	setosa
## 9	4.4	2.9	1.4	0.2	setosa
## 10	4.9	3.1	1.5	0.1	setosa
## 11	5.4	3.7	1.5	0.2	setosa
## 12	4.8	3.4	1.6	0.2	setosa
## 13	4.8	3.0	1.4	0.1	setosa
## 14	4.3	3.0	1.1	0.1	setosa
## 15	5.8	4.0	1.2	0.2	setosa
## 16	5.7	4.4	1.5	0.4	setosa
## 17	5.4	3.9	1.3	0.4	setosa
## 18	5.1	3.5	1.4	0.3	setosa
## 19	5.7	3.8	1.7	0.3	setosa
## 20	5.1	3.8	1.5	0.3	setosa
## 21	5.4	3.4	1.7	0.2	setosa
## 22	5.1	3.7	1.5	0.4	setosa
## 23	4.6	3.6	1.0	0.2	setosa
## 24	5.1	3.3	1.7	0.5	setosa
## 25	4.8	3.4	1.9	0.2	setosa
## 26	5.0	3.0	1.6	0.2	setosa
## 27	5.0	3.4	1.6	0.4	setosa
## 28	5.2	3.5	1.5	0.2	setosa
## 29	5.2	3.4	1.4	0.2	setosa
## 30	4.7	3.2	1.6	0.2	setosa
## 31	4.8	3.1	1.6	0.2	setosa
## 32	5.4	3.4	1.5	0.4	setosa
## 33	5.2	4.1	1.5	0.1	setosa
## 34	5.5	4.2	1.4	0.2	setosa
## 35	4.9	3.1	1.5	0.2	setosa

## 36	5.0	3.2	1.2	0.2	setosa
## 37	5.5	3.5	1.3	0.2	setosa
## 38	4.9	3.6	1.4	0.1	setosa
## 39	4.4	3.0	1.3	0.2	setosa
## 40	5.1	3.4	1.5	0.2	setosa
## 41	5.0	3.5	1.3	0.3	setosa
## 42	4.5	2.3	1.3	0.3	setosa
## 43	4.4	3.2	1.3	0.2	setosa
## 44	5.0	3.5	1.6	0.6	setosa
## 45	5.1	3.8	1.9	0.4	setosa
## 46	4.8	3.0	1.4	0.3	setosa
## 47	5.1	3.8	1.6	0.2	setosa
## 48	4.6	3.2	1.4	0.2	setosa
## 49	5.3	3.7	1.5	0.2	setosa
## 50	5.0	3.3	1.4	0.2	setosa
## 51	7.0	3.2	4.7	1.4	versicolor
## 52	6.4	3.2	4.5	1.5	versicolor
## 53	6.9	3.1	4.9	1.5	versicolor
## 54	5.5	2.3	4.0	1.3	versicolor
## 55	6.5	2.8	4.6	1.5	versicolor
## 56	5.7	2.8	4.5	1.3	versicolor
## 57	6.3	3.3	4.7	1.6	versicolor
## 58	4.9	2.4	3.3	1.0	versicolor
## 59	6.6	2.9	4.6	1.3	versicolor
## 60	5.2	2.7	3.9	1.4	versicolor
## 61	5.0	2.0	3.5	1.0	versicolor
## 62	5.9	3.0	4.2	1.5	versicolor
## 63	6.0	2.2	4.0	1.0	versicolor
## 64	6.1	2.9	4.7	1.4	versicolor
## 65	5.6	2.9	3.6	1.3	versicolor
## 66	6.7	3.1	4.4	1.4	versicolor
## 67	5.6	3.0	4.5	1.5	versicolor
## 68	5.8	2.7	4.1	1.0	versicolor
## 69	6.2	2.2	4.5	1.5	versicolor
## 70	5.6	2.5	3.9	1.1	versicolor
## 71	5.9	3.2	4.8	1.8	versicolor
## 72	6.1	2.8	4.0	1.3	versicolor
## 73	6.3	2.5	4.9	1.5	versicolor
## 74	6.1	2.8	4.7	1.2	versicolor
## 75	6.4	2.9	4.3	1.3	versicolor
## 76	6.6	3.0	4.4	1.4	versicolor
## 77	6.8	2.8	4.8	1.4	versicolor
## 78	6.7	3.0	5.0	1.7	versicolor
## 79	6.0	2.9	4.5	1.5	versicolor
## 80	5.7	2.6	3.5	1.0	versicolor
## 81	5.5	2.4	3.8	1.1	versicolor
## 82	5.5	2.4	3.7	1.0	versicolor
## 83	5.8	2.7	3.9	1.2	versicolor
## 84	6.0	2.7	5.1	1.6	versicolor
## 85	5.4	3.0	4.5	1.5	versicolor
## 86	6.0	3.4	4.5	1.6	versicolor
## 87	6.7	3.1	4.7	1.5	versicolor
## 88	6.3	2.3	4.4	1.3	versicolor
## 89	5.6	3.0	4.1	1.3	versicolor

## 90	5.5	2.5	4.0	1.3 versicolor
## 91	5.5	2.6	4.4	1.2 versicolor
## 92	6.1	3.0	4.6	1.4 versicolor
## 93	5.8	2.6	4.0	1.2 versicolor
## 94	5.0	2.3	3.3	1.0 versicolor
## 95	5.6	2.7	4.2	1.3 versicolor
## 96	5.7	3.0	4.2	1.2 versicolor
## 97	5.7	2.9	4.2	1.3 versicolor
## 98	6.2	2.9	4.3	1.3 versicolor
## 99	5.1	2.5	3.0	1.1 versicolor
## 100	5.7	2.8	4.1	1.3 versicolor
## 101	6.3	3.3	6.0	2.5 virginica
## 102	5.8	2.7	5.1	1.9 virginica
## 103	7.1	3.0	5.9	2.1 virginica
## 104	6.3	2.9	5.6	1.8 virginica
## 105	6.5	3.0	5.8	2.2 virginica
## 106	7.6	3.0	6.6	2.1 virginica
## 107	4.9	2.5	4.5	1.7 virginica
## 108	7.3	2.9	6.3	1.8 virginica
## 109	6.7	2.5	5.8	1.8 virginica
## 110	7.2	3.6	6.1	2.5 virginica
## 111	6.5	3.2	5.1	2.0 virginica
## 112	6.4	2.7	5.3	1.9 virginica
## 113	6.8	3.0	5.5	2.1 virginica
## 114	5.7	2.5	5.0	2.0 virginica
## 115	5.8	2.8	5.1	2.4 virginica
## 116	6.4	3.2	5.3	2.3 virginica
## 117	6.5	3.0	5.5	1.8 virginica
## 118	7.7	3.8	6.7	2.2 virginica
## 119	7.7	2.6	6.9	2.3 virginica
## 120	6.0	2.2	5.0	1.5 virginica
## 121	6.9	3.2	5.7	2.3 virginica
## 122	5.6	2.8	4.9	2.0 virginica
## 123	7.7	2.8	6.7	2.0 virginica
## 124	6.3	2.7	4.9	1.8 virginica
## 125	6.7	3.3	5.7	2.1 virginica
## 126	7.2	3.2	6.0	1.8 virginica
## 127	6.2	2.8	4.8	1.8 virginica
## 128	6.1	3.0	4.9	1.8 virginica
## 129	6.4	2.8	5.6	2.1 virginica
## 130	7.2	3.0	5.8	1.6 virginica
## 131	7.4	2.8	6.1	1.9 virginica
## 132	7.9	3.8	6.4	2.0 virginica
## 133	6.4	2.8	5.6	2.2 virginica
## 134	6.3	2.8	5.1	1.5 virginica
## 135	6.1	2.6	5.6	1.4 virginica
## 136	7.7	3.0	6.1	2.3 virginica
## 137	6.3	3.4	5.6	2.4 virginica
## 138	6.4	3.1	5.5	1.8 virginica
## 139	6.0	3.0	4.8	1.8 virginica
## 140	6.9	3.1	5.4	2.1 virginica
## 141	6.7	3.1	5.6	2.4 virginica
## 142	6.9	3.1	5.1	2.3 virginica
## 143	5.8	2.7	5.1	1.9 virginica

```
## 144      6.8      3.2      5.9      2.3 virginica
## 145      6.7      3.3      5.7      2.5 virginica
## 146      6.7      3.0      5.2      2.3 virginica
## 147      6.3      2.5      5.0      1.9 virginica
## 148      6.5      3.0      5.2      2.0 virginica
## 149      6.2      3.4      5.4      2.3 virginica
## 150      5.9      3.0      5.1      1.8 virginica
```

## Read a description of the data

```
help(iris)
```

```
## starting httpd help server ... done
```

## Display the column and row names of the data

```
colnames(iris)
```

```
## [1] "Sepal.Length" "Sepal.Width"  "Petal.Length" "Petal.Width"
## [5] "Species"
```

```
rownames(iris)
```

```
## [1] "1" "2" "3" "4" "5" "6" "7" "8" "9" "10" "11"
## [12] "12" "13" "14" "15" "16" "17" "18" "19" "20" "21" "22"
## [23] "23" "24" "25" "26" "27" "28" "29" "30" "31" "32" "33"
## [34] "34" "35" "36" "37" "38" "39" "40" "41" "42" "43" "44"
## [45] "45" "46" "47" "48" "49" "50" "51" "52" "53" "54" "55"
## [56] "56" "57" "58" "59" "60" "61" "62" "63" "64" "65" "66"
## [67] "67" "68" "69" "70" "71" "72" "73" "74" "75" "76" "77"
## [78] "78" "79" "80" "81" "82" "83" "84" "85" "86" "87" "88"
## [89] "89" "90" "91" "92" "93" "94" "95" "96" "97" "98" "99"
## [100] "100" "101" "102" "103" "104" "105" "106" "107" "108" "109" "110"
## [111] "111" "112" "113" "114" "115" "116" "117" "118" "119" "120" "121"
## [122] "122" "123" "124" "125" "126" "127" "128" "129" "130" "131" "132"
## [133] "133" "134" "135" "136" "137" "138" "139" "140" "141" "142" "143"
## [144] "144" "145" "146" "147" "148" "149" "150"
```

## Look at the 10th row

```
iris[10, ]
```

```
##      Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 10           4.9           3.1           1.5           0.1  setosa
```

## Look at the 3rd column

```
iris[, 3]
```

```
## [1] 1.4 1.4 1.3 1.5 1.4 1.7 1.4 1.5 1.4 1.5 1.5 1.6 1.4 1.1 1.2 1.5 1.3
## [18] 1.4 1.7 1.5 1.7 1.5 1.0 1.7 1.9 1.6 1.6 1.5 1.4 1.6 1.6 1.5 1.5 1.4
## [35] 1.5 1.2 1.3 1.4 1.3 1.5 1.3 1.3 1.3 1.6 1.9 1.4 1.6 1.4 1.5 1.4 4.7
## [52] 4.5 4.9 4.0 4.6 4.5 4.7 3.3 4.6 3.9 3.5 4.2 4.0 4.7 3.6 4.4 4.5 4.1
## [69] 4.5 3.9 4.8 4.0 4.9 4.7 4.3 4.4 4.8 5.0 4.5 3.5 3.8 3.7 3.9 5.1 4.5
## [86] 4.5 4.7 4.4 4.1 4.0 4.4 4.6 4.0 3.3 4.2 4.2 4.2 4.3 3.0 4.1 6.0 5.1
## [103] 5.9 5.6 5.8 6.6 4.5 6.3 5.8 6.1 5.1 5.3 5.5 5.0 5.1 5.3 5.5 6.7 6.9
## [120] 5.0 5.7 4.9 6.7 4.9 5.7 6.0 4.8 4.9 5.6 5.8 6.1 6.4 5.6 5.1 5.6 6.1
## [137] 5.6 5.5 4.8 5.4 5.6 5.1 5.1 5.9 5.7 5.2 5.0 5.2 5.4 5.1
```

## Alternatively, just look at the variable “Petal.Length”

```
iris$Petal.Length
```

```
## [1] 1.4 1.4 1.3 1.5 1.4 1.7 1.4 1.5 1.4 1.5 1.5 1.6 1.4 1.1 1.2 1.5 1.3
## [18] 1.4 1.7 1.5 1.7 1.5 1.0 1.7 1.9 1.6 1.6 1.5 1.4 1.6 1.6 1.5 1.5 1.4
## [35] 1.5 1.2 1.3 1.4 1.3 1.5 1.3 1.3 1.3 1.6 1.9 1.4 1.6 1.4 1.5 1.4 4.7
## [52] 4.5 4.9 4.0 4.6 4.5 4.7 3.3 4.6 3.9 3.5 4.2 4.0 4.7 3.6 4.4 4.5 4.1
## [69] 4.5 3.9 4.8 4.0 4.9 4.7 4.3 4.4 4.8 5.0 4.5 3.5 3.8 3.7 3.9 5.1 4.5
## [86] 4.5 4.7 4.4 4.1 4.0 4.4 4.6 4.0 3.3 4.2 4.2 4.2 4.3 3.0 4.1 6.0 5.1
## [103] 5.9 5.6 5.8 6.6 4.5 6.3 5.8 6.1 5.1 5.3 5.5 5.0 5.1 5.3 5.5 6.7 6.9
## [120] 5.0 5.7 4.9 6.7 4.9 5.7 6.0 4.8 4.9 5.6 5.8 6.1 6.4 5.6 5.1 5.6 6.1
## [137] 5.6 5.5 4.8 5.4 5.6 5.1 5.1 5.9 5.7 5.2 5.0 5.2 5.4 5.1
```

## Store columns 1-2 and rows 10-20 for later use

```
subset.data <- iris[10:20, 1:2]
```

## Store the species names for later use

```
Species.names <- iris$Species
```

(a) (5 points) What are the different variables in this dataset? What are the measurements of each of these variables for the 10th sample?

```
help(iris)
```

5 variables (columns) named Sepal.Length, Sepal.Width, Petal.Length, Petal.Width, and Species.

```
iris[10,]  
  
##      Sepal.Length Sepal.Width Petal.Length Petal.Width Species  
## 10           4.9           3.1           1.5           0.1  setosa
```

(b) (5 points) How many samples are in this dataset? What are the different species of flower that have been measured?

```
help(iris)
```

OR

```
rownames(iris)  
  
##      [1] "1"  "2"  "3"  "4"  "5"  "6"  "7"  "8"  "9"  "10" "11"  
##     [12] "12" "13" "14" "15" "16" "17" "18" "19" "20" "21" "22"  
##     [23] "23" "24" "25" "26" "27" "28" "29" "30" "31" "32" "33"  
##     [34] "34" "35" "36" "37" "38" "39" "40" "41" "42" "43" "44"  
##     [45] "45" "46" "47" "48" "49" "50" "51" "52" "53" "54" "55"  
##     [56] "56" "57" "58" "59" "60" "61" "62" "63" "64" "65" "66"  
##     [67] "67" "68" "69" "70" "71" "72" "73" "74" "75" "76" "77"  
##     [78] "78" "79" "80" "81" "82" "83" "84" "85" "86" "87" "88"  
##     [89] "89" "90" "91" "92" "93" "94" "95" "96" "97" "98" "99"  
##    [100] "100" "101" "102" "103" "104" "105" "106" "107" "108" "109" "110"  
##    [111] "111" "112" "113" "114" "115" "116" "117" "118" "119" "120" "121"  
##    [122] "122" "123" "124" "125" "126" "127" "128" "129" "130" "131" "132"  
##    [133] "133" "134" "135" "136" "137" "138" "139" "140" "141" "142" "143"  
##    [144] "144" "145" "146" "147" "148" "149" "150"
```

sample-size: 150 cases

```
iris[,5]  
  
##      [1] setosa      setosa      setosa      setosa      setosa      setosa  
##      [7] setosa      setosa      setosa      setosa      setosa      setosa  
##     [13] setosa      setosa      setosa      setosa      setosa      setosa  
##     [19] setosa      setosa      setosa      setosa      setosa      setosa  
##     [25] setosa      setosa      setosa      setosa      setosa      setosa  
##     [31] setosa      setosa      setosa      setosa      setosa      setosa  
##     [37] setosa      setosa      setosa      setosa      setosa      setosa  
##     [43] setosa      setosa      setosa      setosa      setosa      setosa  
##     [49] setosa      setosa      versicolor  versicolor  versicolor  versicolor  
##     [55] versicolor  versicolor  versicolor  versicolor  versicolor  versicolor  
##     [61] versicolor  versicolor  versicolor  versicolor  versicolor  versicolor
```

OR

```
##      [1] setosa      setosa      setosa      setosa      setosa      setosa
##      [7] setosa      setosa      setosa      setosa      setosa      setosa
##     [13] setosa      setosa      setosa      setosa      setosa      setosa
##     [19] setosa      setosa      setosa      setosa      setosa      setosa
##     [25] setosa      setosa      setosa      setosa      setosa      setosa
##     [31] setosa      setosa      setosa      setosa      setosa      setosa
##     [37] setosa      setosa      setosa      setosa      setosa      setosa
##     [43] setosa      setosa      setosa      setosa      setosa      setosa
##     [49] setosa      setosa      versicolor versicolor versicolor versicolor
##     [55] versicolor versicolor versicolor versicolor versicolor versicolor
##     [61] versicolor versicolor versicolor versicolor versicolor versicolor
##     [67] versicolor versicolor versicolor versicolor versicolor versicolor
##     [73] versicolor versicolor versicolor versicolor versicolor versicolor
##     [79] versicolor versicolor versicolor versicolor versicolor versicolor
##     [85] versicolor versicolor versicolor versicolor versicolor versicolor
##     [91] versicolor versicolor versicolor versicolor versicolor versicolor
##     [97] versicolor versicolor versicolor versicolor virginica  virginica
##    [103] virginica  virginica  virginica  virginica  virginica  virginica
##    [109] virginica  virginica  virginica  virginica  virginica  virginica
##    [115] virginica  virginica  virginica  virginica  virginica  virginica
##    [121] virginica  virginica  virginica  virginica  virginica  virginica
##    [127] virginica  virginica  virginica  virginica  virginica  virginica
##    [133] virginica  virginica  virginica  virginica  virginica  virginica
##    [139] virginica  virginica  virginica  virginica  virginica  virginica
##    [145] virginica  virginica  virginica  virginica  virginica  virginica
## Levels: setosa versicolor virginica
```

species: setosa, versicolor, virginica

calculate the 5-number summary of the *{iris}* dataset

```
five.num.summary <- summary(iris)
print(summary(iris))

##      Sepal.Length      Sepal.Width      Petal.Length      Petal.Width
##      Min.       :4.300      Min.       :2.000      Min.       :1.000      Min.       :0.100
##      1st Qu.:5.100      1st Qu.:2.800      1st Qu.:1.600      1st Qu.:0.300
##      Median :5.800      Median :3.000      Median :4.350      Median :1.300
##      Mean   :5.843      Mean   :3.057      Mean   :3.758      Mean   :1.199
##      3rd Qu.:6.400      3rd Qu.:3.300      3rd Qu.:5.100      3rd Qu.:1.800
##      Max.   :7.900      Max.   :4.400      Max.   :6.900      Max.   :2.500
##           Species
##      setosa      :50
##      versicolor:50
##      virginica  :50
##
##
##
```

calculate the standard deviation across the first four columns of the dataset

```
st.devs.cols <- apply(iris[,1:4], 2, sd)
print(st.devs.cols)

## Sepal.Length Sepal.Width Petal.Length Petal.Width
##      0.8280661      0.4358663      1.7652982      0.7622377
```

calculate the standard deviation across the samples of the dataset

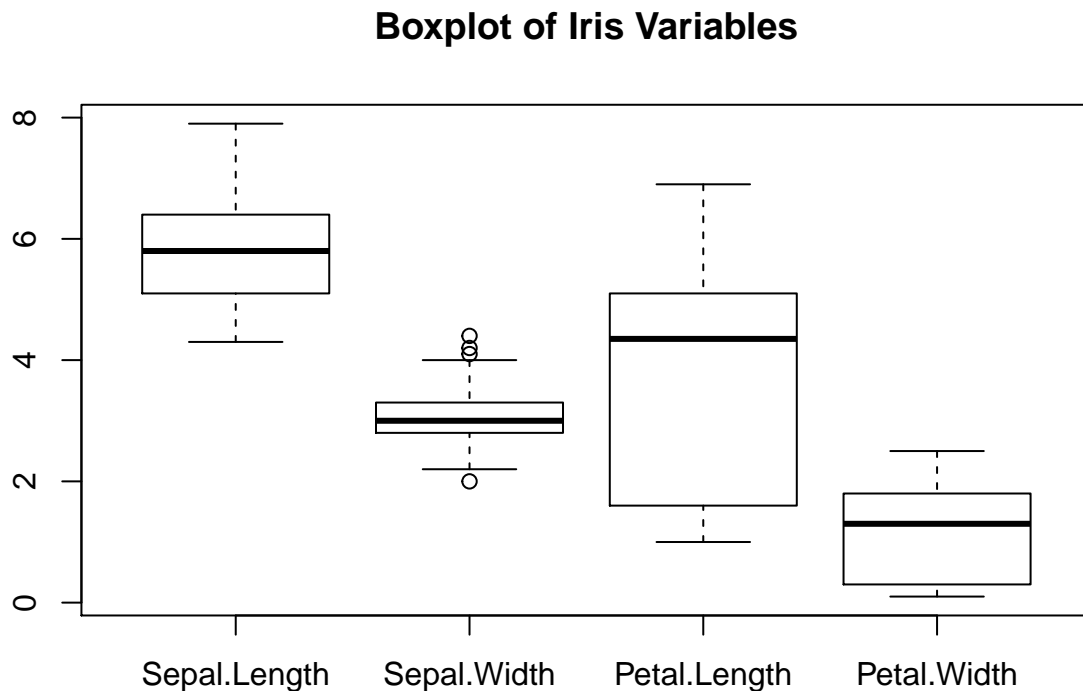
```
st.devs.rows <- apply(iris[, 1:4], 1, sd)
print(st.devs.rows)

##      [1] 2.179449 2.036950 1.997498 1.912241 2.156386 2.230844 1.936276
##      [8] 2.109305 1.822773 2.068816 2.307957 2.016598 2.032035 1.883923
##     [15] 2.566450 2.467117 2.307235 2.143789 2.369775 2.173131 2.238117
##     [22] 2.120338 2.087263 1.995829 1.977161 2.048577 2.019901 2.201515
##     [29] 2.205297 1.950000 1.977161 2.199053 2.338625 2.447277 2.032035
##     [36] 2.135416 2.357082 2.155613 1.851801 2.148643 2.123480 1.796292
##     [43] 1.882153 1.961929 2.070427 1.960230 2.192981 1.941649 2.269178
##     [50] 2.112463 2.371181 2.070427 2.326657 1.855398 2.176388 1.927650
##     [57] 2.002290 1.635033 2.275229 1.626858 1.750000 1.862794 2.181742
##     [64] 2.054872 1.782321 2.234577 1.786057 2.041241 2.155613 1.925920
##     [71] 1.798842 2.027313 2.193931 2.146315 2.163909 2.205297 2.357258
##     [78] 2.201515 1.950000 1.961292 1.888562 1.915724 1.944222 2.046949
```



```
## [85] 1.714643 1.853600 2.224110 2.229163 1.812917 1.822773 1.905037
## [92] 2.027108 1.966384 1.687207 1.859211 1.903287 1.873277 2.082266
## [99] 1.658061 1.873277 1.908533 1.869715 2.361320 2.145538 2.095034
## [106] 2.683747 1.544884 2.639918 2.412468 2.173323 1.994994 2.123480
## [113] 2.176388 1.823915 1.678044 1.881489 2.174090 2.544275 2.821790
## [120] 2.165448 2.139120 1.701715 2.820165 2.050000 2.118962 2.483948
## [127] 1.976529 1.919201 2.095034 2.556039 2.621068 2.633597 2.061553
## [134] 2.173131 2.285279 2.555223 1.830073 2.121320 1.865476 2.177728
## [141] 2.033880 2.068010 1.869715 2.142429 1.975686 2.021551 2.075853
## [148] 2.046745 1.791415 1.884144
```

```
boxplot(iris[, 1:4], main = "Boxplot of Iris Variables")
```



(a) (5 points) How many of each species are there in the dataset?

```
five.num.summary <- summary(iris)
print(summary(iris))
```

```
## Sepal.Length Sepal.Width Petal.Length Petal.Width
## Min. :4.300 Min. :2.000 Min. :1.000 Min. :0.100
## 1st Qu.:5.100 1st Qu.:2.800 1st Qu.:1.600 1st Qu.:0.300
## Median :5.800 Median :3.000 Median :4.350 Median :1.300
## Mean :5.843 Mean :3.057 Mean :3.758 Mean :1.199
## 3rd Qu.:6.400 3rd Qu.:3.300 3rd Qu.:5.100 3rd Qu.:1.800
## Max. :7.900 Max. :4.400 Max. :6.900 Max. :2.500
```

```
##      Species
## setosa      :50
## versicolor:50
## virginica   :50
##
##
##
```

50 of each specie

(b) (5 points) Which two variables have a median that is smaller than their corresponding mean

```
five.num.summary <- summary(iris)
print(summary(iris))

## Sepal.Length Sepal.Width Petal.Length Petal.Width
## Min. :4.300 Min. :2.000 Min. :1.000 Min. :0.100
## 1st Qu.:5.100 1st Qu.:2.800 1st Qu.:1.600 1st Qu.:0.300
## Median :5.800 Median :3.000 Median :4.350 Median :1.300
## Mean :5.843 Mean :3.057 Mean :3.758 Mean :1.199
## 3rd Qu.:6.400 3rd Qu.:3.300 3rd Qu.:5.100 3rd Qu.:1.800
## Max. :7.900 Max. :4.400 Max. :6.900 Max. :2.500
##      Species
## setosa      :50
## versicolor:50
## virginica   :50
##
##
##
```

Sepal.Length and Sepal.Width

(c) (5 points) What is the standard deviation of the sepal length measurements?

```
st.devs.cols <- apply(iris[,1:4], 2, sd)
print(st.devs.cols)

## Sepal.Length Sepal.Width Petal.Length Petal.Width
## 0.8280661 0.4358663 1.7652982 0.7622377
```

sd of Sepal.Length=0.8280661

(d) (5 points) Calculate the 5-number summary and standard deviations of the subset you extracted earlier (subset.data). What is the standard deviation of the sepal length measurements for this subset?

```
summary(subset.data)
```

```
##   Sepal.Length   Sepal.Width  
##   Min.      :4.300   Min.      :3.00  
##   1st Qu.:4.850   1st Qu.:3.25  
##   Median :5.100   Median :3.70  
##   Mean    :5.182   Mean     :3.60  
##   3rd Qu.:5.550   3rd Qu.:3.85  
##   Max.     :5.800   Max.      :4.40
```

```
apply(subset.data,2, sd)
```

```
## Sepal.Length Sepal.Width  
##    0.4665151    0.4472136
```

sd of Sepal Length in subset=0.4665151