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**COM SCI X 450.2**

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**Homework 1**

**Task 1: Strip Jitter Charts**

**Code:**  
Chart, scatter chart

Description automatically generatedstripchart(bears$age,

main = 'California Black Bear Age',

xlab = 'Age (Months)',

pch = 8,

method = 'jitter',

col = 'brown')

**Analysis:**  
It appears that about 93% of sampled bears have an age less than 100 months. Half of the sample bears seem to be <= 50 months old and the other half > 50 and <= 100 months old.

**Chart, scatter chart

Description automatically generatedCode:**

stripchart(bears$headlength,

main = 'California Black Bear Head Length',

xlab = 'Head Length (inches)',

pch = 8,

method = 'jitter',

col = 'brown')

Chart, scatter chart

Description automatically generated

**Code:**

stripchart(bears$headwidth,

main = 'California Black Bear Head Width',

xlab = 'Head Width (inches)',

pch = 8,

method = 'jitter',

col = 'brown')

Chart, scatter chart

Description automatically generated

**Code:**  
stripchart(bears$neckcircum,

main = 'California Black Bear Neck Circumference',

xlab = 'Neck Circumference (inches)',

pch = 8,

method = 'jitter',

col = 'brown')

Chart, scatter chart

Description automatically generated  
 **Code:**  
stripchart(bears$length,

main = 'California Black Bear Length',

xlab = 'Length (inches)',

pch = 8,

method = 'jitter',

col = 'brown')

**Chart, scatter chart

Description automatically generatedCode:**  
stripchart(bears$chest,

main = 'California Black Bear Chest Width',

xlab = 'Chest Width (inches)',

pch = 8,

method = 'jitter',

col = 'brown')

**Chart, scatter chart

Description automatically generatedCode:**

stripchart(bears$weight,

main = 'California Black Bear Weight',

xlab = 'Chest Weight (lbs)',

pch = 8,

method = 'jitter',

col = 'brown')

**Analysis:**  
I suspect this strip jitter chart is influenced by the sampled bears age distribution.

**Task 2: Dot Charts**

**Chart, line chart

Description automatically generatedCode:**

bears\_ordered\_length <- bears[order(bears$length),]

dotchart(bears\_ordered\_length$length,

labels = bears\_ordered\_length$gender,

main = 'California Black Bear Length to Gender',

xlab = 'Length (inches)',

ylab = 'Gender',

pch = 8,

cex = 0.5)

**Chart

Description automatically generatedCode:**

bears\_ordered\_chest <- bears[order(bears$chest),]

dotchart(bears\_ordered\_chest$chest,

labels = bears\_ordered\_chest$gender,

main = 'California Black Bear Chest Width to Gender',

xlab = 'Chest Width (inches)',

ylab = 'Gender',

pch = 8,

cex = 0.5)

**Chart, line chart

Description automatically generatedCode:**  
bears\_ordered\_weight <- bears[order(bears$weight),]

dotchart(bears\_ordered\_weight$weight,

labels = bears\_ordered\_weight$gender,

main = 'California Black Bear Weight to Gender',

xlab = 'Weight (lbs)',

ylab = 'Gender',

pch = 8,

cex = 0.5)

**Task 3: Box Plots**

**Chart, box and whisker chart

Description automatically generated**

**Code:**par(mfrow=c(1,2))

boxplot(male\_bears$age, col = 'lightblue', main = 'Male Black Bears', ylab = 'Age (months)', ylim = c(8.00,177.00))

boxplot(female\_bears$age, col = 'lightpink', main = 'Female Black Bears', ylim = c(8.00,177.00))

**Male Black Bear Age Summary:**

Min. 1st Qu. Median Mean 3rd Qu. Max.

8.00 16.50 32.00 39.34 53.00 177.00

**Female Black Bear Age Summary:**

Min. 1st Qu. Median Mean 3rd Qu. Max.

8.00 18.50 57.00 51.21 75.50 104.00

**Analysis**  
The male bear age distribution is positively skewed as the median (32.0 months) is closer to Q1 (16.50 months) and right/top whisker is longer than left/bottom whisker. Age ranges from 8.0 to 83.0 months excluding outlying bears that are 115.0 and 177 months old.

The female age distribution is negatively skewed as the median (57.0 m) is closer to Q3 (75.50 months) and right/top whisker is longer than left/bottom whisker. Age ranges from 8.0 to 104 months.

Male age distribution is more compact and female distribution is more spread out.

**Chart, box and whisker chart

Description automatically generated**

**Code:**par(mfrow=c(1,2))

boxplot(male\_bears$headlength, col = 'lightblue', main = 'Male Black Bears', ylab = 'Head Length (inches)', ylim = c(9.00, 17.00))

boxplot(female\_bears$headlength, col = 'lightpink', main = 'Female Black Bears', ylim = c(9.00, 17.00))

**Male Black Bear Head Length Summary:**

Min. 1st Qu. Median Mean 3rd Qu. Max.

9.00 11.50 13.50 13.23 15.50 17.00

**Female Black Bear Head Length Summary:**

Min. 1st Qu. Median Mean 3rd Qu. Max.

9.00 11.50 13.00 12.45 13.50 15.50

**Analysis:**The male bear head length distribution is slightly positively skewed but overall it can be considered a normal distribution based on the almost identical symmetry of interquartile and whiskers length. Head length distribution ranges from 9.0 to 17.0 inches  
The female head length distribution is positively skewed as the interquartile has a larger area to the left of the median and left whisker is longer than the right. Head length distribution ranges from 9.0 to 15 inches.  
Overall, both have a similar distribution range.

**Chart, box and whisker chart

Description automatically generatedCode:**par(mfrow=c(1,2))

boxplot(male\_bears$headwidth, col = 'lightblue', main = 'Male Black Bears', ylab = 'Head Width (inches)', ylim = c(4.00, 10.00))

boxplot(female\_bears$headwidth, col = 'lightpink', main = 'Female Black Bears', ylim = c(4.00,10.00))

**Male Black Bear Head Width Summary:**

Min. 1st Qu. Median Mean 3rd Qu. Max.

4.000 5.000 6.000 6.471 8.000 10.000

**Female Black Bear Head Width Summary:**

Min. 1st Qu. Median Mean 3rd Qu. Max.

4.500 5.000 5.500 5.684 6.500 7.000

**Analysis:**

The male head width distribution has a range from 4.0 to 10.0 inches. The female bear head distribution ranges from 4.5 to 7.0. Both distributions are negatively skewed. Based on the plot and the number of male and female samples we can say that males tend to have wider heads.

**Chart, box and whisker chart

Description automatically generatedCode:**  
par(mfrow=c(1,2))

boxplot(male\_bears$neckcircum, col = 'lightblue', main = 'Male Black Bears', ylab = 'Neck Circumference (inches)', ylim = c(10.00, 31.50))

boxplot(female\_bears$neckcircum, col = 'lightpink', main = 'Female Black Bears', ylim = c(10.00, 31.50))

**Male Black Bear Neck Circumference Summary:**

Min. 1st Qu. Median Mean 3rd Qu. Max.

13.00 17.00 21.50 21.71 27.00 31.50

**Female Black Bear Neck Circumference Summary:**

Min. 1st Qu. Median Mean 3rd Qu. Max.

10.00 15.00 19.00 18.42 21.25 28.00

**Analysis:**

Male bear neck width distribution is normally distributed as seen by its symmetry along the media.   
Female neck width distribution is positively skewed. Ranges are very close to one another as well as distribution.

**Chart, box and whisker chart

Description automatically generated**

**Code:**  
par(mfrow=c(1,2))

boxplot(male\_bears$length, col = 'lightblue', main = 'Male Black Bears', ylab = 'Length (inches)', ylim = c(36.00, 76.50))

boxplot(female\_bears$length, col = 'lightpink', main = 'Female Black Bears', ylim = c(36.00, 76.50))

**Male Black Bear Length Summary:**

Min. 1st Qu. Median Mean 3rd Qu. Max.

37.00 49.50 61.00 59.42 69.50 76.50

**Female Black Bear Length Summary:**

Min. 1st Qu. Median Mean 3rd Qu. Max.

36.00 52.25 60.50 57.13 63.00 70.00

**Analysis:**  
Male bear length distribution is slightly positively skewed and female distribution is positively skewed.  
Both distributions have a similar range but we can see that most female bears will be shorter than 63.00 iches compared to males 69.50 inches.

Chart, box and whisker chart

Description automatically generated

**Code:**

par(mfrow=c(1,2))

boxplot(male\_bears$chest, col = 'lightblue', main = 'Male Black Bears', ylab = 'Chest Width (inches)', ylim = c(19.00, 55.00))

boxplot(female\_bears$chest, col = 'lightpink', main = 'Female Black Bears', ylim = c(19.00, 55.00))

**Male Black Bear Chest Width Summary:**

Min. 1st Qu. Median Mean 3rd Qu. Max.

19.00 29.25 35.00 36.81 44.25 55.00

**Female Black Bear Chest Width Summary:**

Min. 1st Qu. Median Mean 3rd Qu. Max.

19.00 28.50 32.00 33.55 39.00 48.00

**Analysis:**Male and female distributions are negatively skewed. We can see that most female bears will have a chest width shorter than 33.55 inches compared to males 44.25 inches.

**Chart, box and whisker chart

Description automatically generatedCode:**

par(mfrow=c(1,2))

boxplot(male\_bears$weight, col = 'lightblue', main = 'Male Black Bears', ylab = 'Weight (lbs)', ylim = c(26.00, 514.00))

boxplot(female\_bears$weight, col = 'lightpink', main = 'Female Black Bears', ylim = c(26.00, 514.00))

**Male Black Bear Weight Summary:**

Min. 1st Qu. Median Mean 3rd Qu. Max.

34.0 88.0 154.0 199.7 301.0 514.0

**Female Black Bear Weight Summary:**

Min. 1st Qu. Median Mean 3rd Qu. Max.

26.0 90.5 140.0 151.8 203.0 356.0

**Analysis:**

Both male and female distributions are positively skewed. The range difference between the two is significant with male bears weighing from 34.0 pounds to 514.0 pounds and female bears from 26 pound to 356.0 pounds.

Looks like male bears are generally heavier than females.