

Handout #30 - More Boxplots

Create boxplots for the distributions.

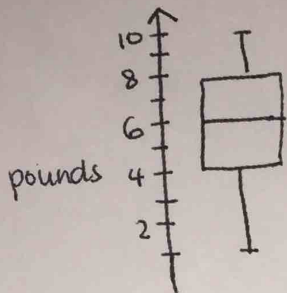
1, 3, 4, 4, 5, 7, 7, 8, 9, 10

1. {7 lbs., 8 lbs., 5 lbs., 1 lbs., 3 lbs., 4 lbs., 4 lbs., 9 lbs., 10 lbs., 7 lbs.}

(3)

Min	1
Q ₁	4
Median	6
Q ₃	8
Max	10

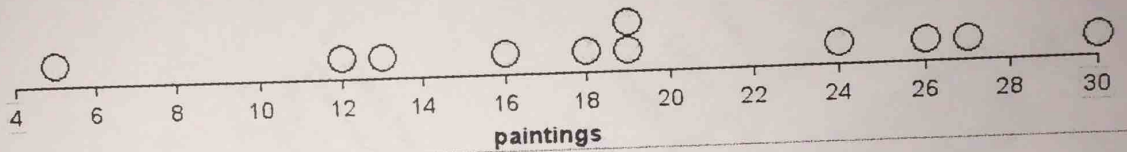
2.



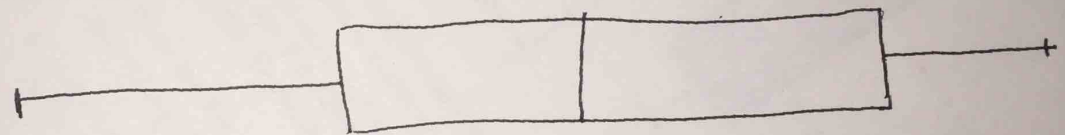
$$\begin{aligned} \text{Upper Fence} &= Q_3 + 1.5(IQR) \\ &= 8 + 1.5(4) \\ &= 14 \\ \text{Lower Fence} &= Q_1 - 1.5(IQR) \\ &= 4 - 1.5(4) \\ &= -2 \end{aligned}$$

No Outliers

(5) (5)

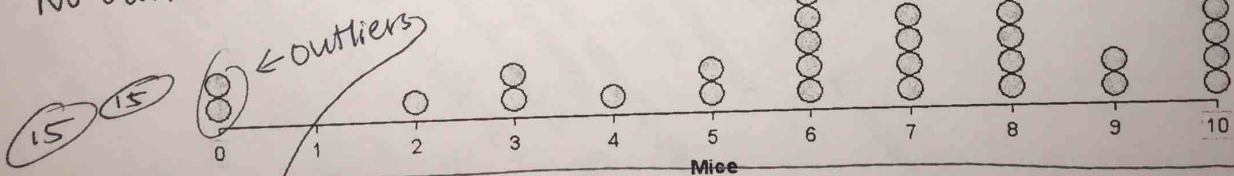


Min	5
Q ₁	13
Median	19
Q ₃	26
Max	30



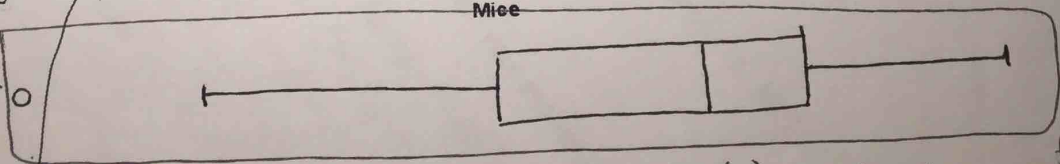
$$\begin{aligned} \text{Upper Fence} &= Q_3 + 1.5(IQR) = 26 + 1.5(26-13) = 45.5 \\ \text{Lower Fence} &= Q_1 - 1.5(IQR) = 13 - 1.5(13) = -6.5 \end{aligned}$$

No outliers!



3.

Min	0
Q ₁	5
Median	7
Q ₃	8
Max	10



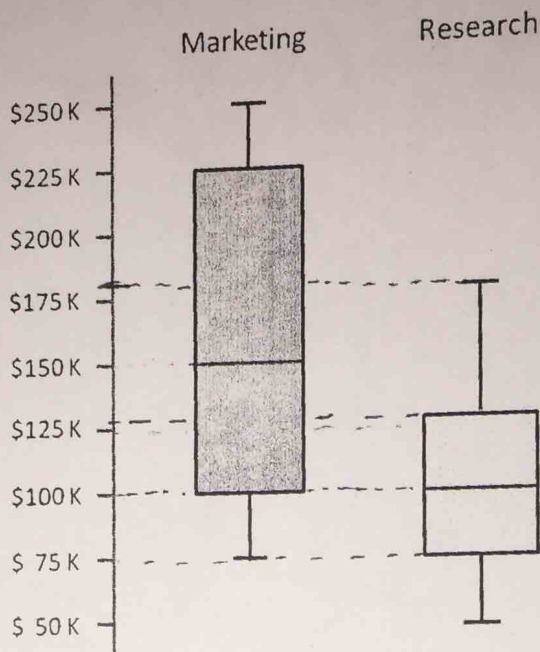
$$\begin{aligned} \text{Upper Fence} &= Q_3 + 1.5(IQR) = 8 + 1.5(3) = 12.5 \\ \text{Lower Fence} &= Q_1 - 1.5(IQR) = 5 - 1.5(3) = 0.5 \end{aligned}$$

box plot includes "0" for outliers!

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4. Consider the boxplot of salaries for two different kinds of careers:

Base Salary Comparison



Range = Max - Min

Market = 250 - 75 = 175

Research = 180 - 50 = 130

$IQR = Q_3 - Q_1$

marketing IQR = 225 - 100 = 125k

Research IQR = 130 - 75 = 55k

a. What are the median salaries of the two salary distributions?

The median salary for marketing is \$150k

The median salary for research is \$100k

b. What are the IQRs of the two salary distributions?

The IQR for marketing is \$125k and the IQR for research is \$55k

c. What are the ranges of the two salary distributions?

Marketing: \$175k research = \$130k

d. Which profession has a typically higher salary? Explain your answer, including what part of the boxplots you are comparing.

The median salary for Marketing is larger than for Research. We

can also see that the middle 50% (the boxes) for marketing is

mostly above the middle 50% for research. In particular, the median for Marketing is larger than Q3 (about 130k) for Research. This means that over 1/2 of those in marketing get paid more than 75% of those

e. Which profession has more salary variability? Explain your answer, including what part of the boxplots you are comparing.

Marketing also has more variability. You can see this in the IQR, (which is the length of the box) and in the range as well.