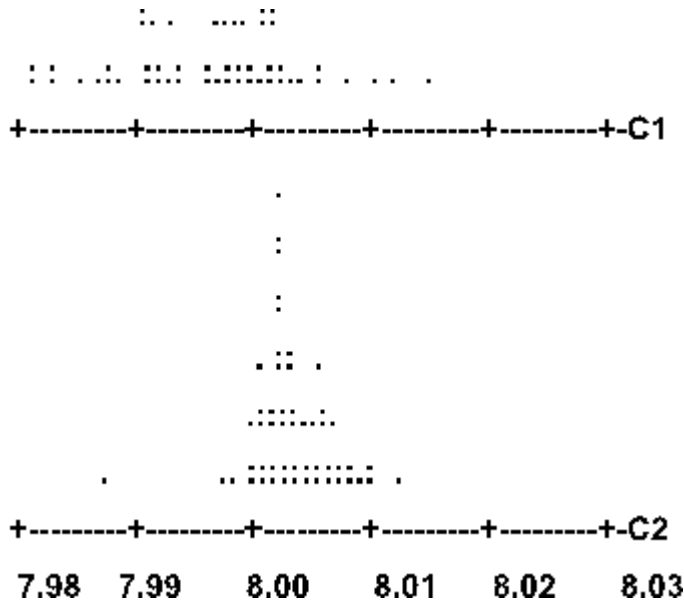


AP Statistics
Assignment 1.3

Be sure to fully explain all answers.

Question 1

Two machines, C1 and C2, are making pins which must have a diameter of $8 \text{ cm} \pm .01$ cm or they are rejected. Dotplots of 50 pins from each machine are displayed below. They are both on the same scale.



- a) By simply looking at the dotplots, i.e. without doing any calculations or counting, compare the distributions of the two machines.

- b) In what sense is machine C1 'better' at producing pins? Justify your argument.

- c) In what sense is machine C2 'better' at producing pins? Justify your argument.

Question 2

In 1798, Henry Cavendish measured the density of the earth using an instrument called a torsion balance. While the density is obviously not uniform, the value of the mean density is important in determining the earth's composition. The units are grams / cm³.

Density of the Earth

5.5 5.57 5.42 5.61 5.53 5.47 4.88 5.62 5.63 4.07 5.29 5.34
5.26 5.44 5.46 5.55 5.34 5.3 5.36 5.79 5.75 5.29 5.1 5.86
5.58 5.27 5.85 5.65 5.39

- a) Construct a stemplot of this data. Justify your construction method. Tabs are set up (but feel free to adjust) to help you.

- b) Describe the distribution.

Question 3

Shortly after metric units were introduced in Australia, a group of 44 students was asked to guess, to the nearest meter, the width of the lecture hall in which they were sitting. The true width of the hall was 13.1 meters.

Guesses (Meters)

8 9 10 10 10 10 10 10 11 11 11 11 12
12 13 13 13 14 14 14 15 15 15 15 15 15
15 15 16 16 16 17 17 17 17 18 18 20 22
25 27 35 38 40

- a) Construct a stemplot of this data. Tabs are set up to help you.

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- b) Describe the distribution.

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- c) A second group of students in the same room were asked to guess the width of the room in feet, measured to the nearest foot (1 meter = 3.28 feet, to 2 decimal places). Construct a back to back stemplot from these two datasets (Tabs are set up). How will you overcome the problem that different units are used in the two datasets?

Guesses (Feet)

24 25 27 30 30 30 30 30 30 32 32 33 34
34 34 35 35 36 36 36 37 37 40 40 40 40
40 40 40 40 40 41 41 42 42 42 42 43 43
44 44 44 45 45 45 45 45 45 46 46 47 48
48 50 50 50 51 54 54 54 55 55 60 60 63
70 75 80 94

Copy your answer from part a, and then add in the additional data.

Source: Hills, M. et al, *Statistical Methods, Unit 1: Data, distributions and uncertainty*, Open University, England.