MTH 23.5 LECTURE NOTES (Ojakian)

Topic 6: Frequency Tables/Histograms and Fraction, Decimals, Percents

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OUTLINE

References (**Algebra Book**: pages 3, 4; **Statistics Book**: 1.3, 2.1, 2.2)

1. Frequency Tables
2. Histograms
3. Doing Relative Frequency
4. Doing it in Excel?

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1. Basics of Frequencey Table for numeric data

   Called: Frequency Table or Frequency Distribution.

   (a) Break up x axis into numeric ranges

   (b) Required properites of numeric ranges:

      i. Every data item in exactly one class (like bar graph)
      ii. Each class is the same width (different from bar graph)

   (c) What to do if data is on a boundary? (boundary also called class limit)

      i. Who cares!
      ii. But to be consistent: Count data to be in the first class it appears.

   (d) And to avoid:

      i. First class starts too soon
      ii. Last class goes too far

   (e)

   PROBLEM 1. *Make frequency table of one of the quantitative variables of our class data, using some number of classes.*

   PROBLEM 2. *Suppose we are considering data which include the following: 23, 5, 67, 40. What is wrong with taking the following as our classes for a frequency table:*

   20 - 30, 30 - 40, 40 - 50?

   PROBLEM 3. *Suppose we are considering data which include the following: 23, 5, 67, 40. What is wrong with taking the following as our classes for a frequency table:*

   20 - 30, 30 - 45, 45 - 60, 60 - 70?

2. Basics of Histograms

   Note: We will do simplified version of what the book does!

   (a) Histogram is simply a drawing of the frequency table

(b) Make sure the axes are to scale (use zig-zag as needed ...)

PROBLEM 4. *Make a histogram from the frequency table in Problem 1.*

(c) What does the histogram tell us about our data?

Typical Questions:

i. Symmetrical, bimodal, skewed left (longer tail on left side), or skewed right (longer tail on right side)?

ii. Any outliers?

3. Details on How to Begin a Frequency Table

Either start with some **Class Width** or some **Number Of Classes**.

(a) If start you start with Class Width (what we did above, and less typical):

i. Start with smallest data.

ii. Make each class the desired width.

iii. Go till you include the largest data.

(b) If you start with the Number Of Classes.

i. Set Class Width $= \dfrac{\text{Max} - \text{Min}}{\text{Number of Classes}}$

ii. If not an integer, Increase it to the the next integer (could in theory use the decimal number).

iii. Then proceed as before, starting with the smallest data ...

(c)

PROBLEM 5. *Make the corresponding histogram from Problem 1.*

4. Relative Frequency - Histograms meet Fractions ...

(a) Everything is the same! Except ...

Change the y axis to relative frequency as we did for bar graphs.

(b) To make Relative-Frequency Histogram: Just change y-axis labels on original histogram.

PROBLEM 6. *Convert the frequency table and histogram from Problem 5 into a relative-frequency histogram.*

PROBLEM 7. *What do the percentages from the classes add up to? Is this always the case?*

5. Reading Histograms

PROBLEM 8. *From the book, section 2.1 (7th ed), do problem 7.*