

TOPIC: FREQUENCY DISTRIBUTIONS

Intro to Frequency Distributions

◆ **Frequency Distribution:** A table showing frequency vs. chosen _____ of numbers or labels (“**classes**”).

EXAMPLE

The data below lists the amount of time (in minutes) students spent studying for their exam each week. Construct a frequency distribution using 6 evenly-spaced classes, and calculate their relative frequencies.

Time spent studying (mins) for exam									
20	30	35	40	40	45	50	55	65	75

Frequency Distribution			Lower class limit: _____ # in each class
Time spent studying (mins) for exam	Frequency (f)	Relative freq. ($\frac{f}{\text{---}} \times 100\%$)	Upper class limit: _____ # in each class
20 – 29			Class Midpoint: _____ # in each class
30 – 39			$\left(\frac{\text{lower} + \text{upper}}{2}\right) =$
40 – 49			
50 – 59			Class width:
60 – 69			Difference btwn 2 _____ lower
70 – 79			OR upper class limits (NOT upper – lower)

◆ A **Relative Freq. Distribution** shows those frequencies as _____ of TOTAL # of measurements, ***n***.

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PRACTICE

Use the frequency distribution below to find the class width and class midpoints.

Travel Time to Work (mins)	Frequency (f)
5 – 15	156
16 – 26	343
27 – 37	249
38 – 48	172
49 – 59	98
60 – 70	56
71 – 81	40

PRACTICE

The following data set shows the number of overtime hours that 12 employees worked in a month. Construct a frequency distribution, using a lower class limit of 3 and a class width of 4.

Overtime Hours Worked											
3	8	5	12	14	7	9	15	6	10	13	4

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EXAMPLE

At a café one day, you count how many customers are served each hour over 14 hours. Construct a frequency distribution table using a lower class limit of 15 and a class width of 5. Calculate the relative frequencies of each. What percentage of the day is the café serving **30 or more** customers per hour?

Customers Served per Hour													
15	24	30	21	27	35	32	31	38	41	26	33	36	40

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How to Create Frequency Distributions

◆ You may have to create frequency distributions given *only* the # of classes (usually 5-20), but *not* the class limits.

EXAMPLE

The data below lists the amount of time (in minutes) students spent studying for their exam each week. Construct a frequency distribution with 8 classes.

Time spent studying for exam (mins)																			
5	15	20	24	35	35	40	45	50	50	52	55	60	63	65	72	80	85	95	115

Time spent studying (mins) for exam	Frequency (f)

HOW TO: Create Freq. Distributions

- 1) Calculate class width: $\frac{\text{max} - \text{min}}{\text{\# of classes}}$, round up to nearest whole # OR convenient #
- 2) Find lower class limits:
1st Lower: # $\leq$ data minimum
Next Lower: Prev. Lower + class width
- 3) Find upper class limits:
1st Upper: 2nd Lower – 1
- 4) Find f for each class, tally each data value in its appropriate class

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EXAMPLE

The data below shows the sales (in dollars) for 15 sales representatives at a company. Construct a frequency distribution using 5 classes.

Sales (in \$)														
1223	1136	819	1089	1011	997	973	1025	1017	1118	988	843	1196	1081	942

HOW TO: Create Freq. Distributions

- 1) Calculate class width: $\frac{\text{max} - \text{min}}{\text{\# of classes}}$, round up to nearest whole # OR convenient #
- 2) Find lower class limits:
1st Lower: # $\leq$ data minimum
Next Lower: Prev. Lower + class width
- 3) Find upper class limits:
1st Upper: 2nd Lower – 1
- 4) Find f for each class, tally each data value in its appropriate class

PRACTICE

A data set has a minimum value of 16 and a maximum value of 71. Without constructing a table, find the class width if you organized this data into 7 classes. Write the lower and upper class limits.

min = 16; max = 71; 7 classes