

STAT 101 Worksheet: Vinyl & Measures of Position

Music Industry

Sale of records:

Vinyl – you know those big flat disks that your parents have a bunch of, but can no longer play because the record player no longer works.

Data Source: RIAA.com (Recording Industry Association of America)

for median 2.3, 3.5, 3.8, 4.4, 4.8, 5.3, 5.4, 5.5, 7.5, 10.1, 10.2, 11.7, 15.1, 19.8, 22.0, 27.6  
Listed below is the sale in millions of records for the years 1990 – 2005.

Year:	'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	'05	'06
Singles:	27.6	22.0	19.8	15.1	11.7	10.2	10.1	7.5	5.4	5.3	4.8	5.5	4.4	3.8	3.5	2.3	both included
LP:	11.7	4.8	2.3	1.2	1.9	2.2	2.9	2.7	3.4	2.9	2.2	2.3	1.7	1.5	1.3	1.0	in other categories

for median 1.0, 1.2, 1.3, 1.5, 1.7, 1.9, 2.2, 2.2, 2.3, 2.3, 2.7, 2.9, 2.9, 3.4, 4.8, 11.7

1) For each of the variables above (Singles & LP) identify items listed below.

Determine:

- Measures of Center: Mean, Median, & Mode
- Measures of Variation: Range, Variance & Standard Deviation
- Measures of Position: Obtain the Five number summary
- Use Pearson's Index of Skewness to determine if the distribution is skewed.
- Determine the coefficient of variation
- Determine a z-score associated with the 1995 value of the variable.
- Draw a dot plot
- Create a Line Chart of these data (two year interval beginning at 1990)
- Draw a Modified Box plot and determine the: IQR of the data; the upper and lower limits; Identify adjacent points (if any); Identify outliers
- Create a grouped frequency table for which the first class has a lower class limit of 0 and an upper class limit of 4 for the SINGLES data (0 and 1 for the LP data). Identify the class width, midpoint and boundaries of the second class.
- Build a relative frequency histogram of the frequency table.

*Handwritten notes:*  
 L.P. = 1.734  
 single = 1.37  
 $L.P. z = \frac{2.2 - 2.875}{2.54} = .265$   
 $single z = \frac{10.2 - 9.94}{7.51} = .035$   
 CHARTS →

*Handwritten notes for LP:*  
 L.P. (Sales in millions)  
 n = 16  
 Med = 2.25  
 Q<sub>1</sub> = 1.55  
 Q<sub>3</sub> = 2.90  
 MIN = 1.00  
 MAX = 11.7  
 IQR = 1.35  
 L.L. = -4.75  
 U.L. = 4.925  
 Adj. Pt. = 4.8  
 $\Sigma X = 46.0$   
 $\Sigma X^2 = 228.34$   
 $\bar{X} = 2.875$   
 S = 2.54  
 Mode = 2.3, 2.2, 2.9  
 I = .734  
 C.V. = 88.3%

X	X <sup>2</sup>
1	1
1.3	1.69
1.5	2.25
1.7	2.89
2.3	5.29
2.2	4.84
2.9	8.41
3.4	11.58
2.7	7.29
2.9	8.41
2.2	4.84
1.9	3.61
1.2	1.44
2.3	5.29
4.8	23.04
11.7	136.89
$\Sigma X$	46.0
$\Sigma X^2$	228.34

#10) SINGLES

SALES	f	rf	cf	crf
0-4	4	.2500	4	.25
5-9	5	.3125	9	.5625
10-14	3	.1875	12	.7500
15-19	2	.1250	14	.8750
20-24	1	.0625	15	.9375
25-29	1	.0625	16	1.0000
Total	16	1.0000	-	-

#10) L.P. SALGS

SALES	f	rf	cf	crf
0-1	3	.1875	3	.1875
2-3	11	.6875	14	.8750
4-5	1	.0625	15	.9375
6-7	0	0	0	.9375
8-9	0	0	0	.9375
10-11	0	0	0	.9375
12-13	1	.0625	16	1.0000
Total	16	1.0000	-	-

Singles (Sales in millions)

n = 16  
 I = 1.37  
 Q<sub>1</sub> = 4.3  
 Q<sub>2</sub> = 6.5  
 Q<sub>3</sub> = 14.25  
 MAX = 27.6  
 Mode = none  
 IQR = 9.75  
 LL = -10.13  
 UL = 28.88  
 Adj. Pt = NA  
 $\Sigma X = 159.0$   
 $\Sigma X^2 = 2426.58$   
 $\bar{X} = 9.94$   
 S = 7.51  
 S<sup>2</sup> = 56.45

X	X <sup>2</sup>
2.3	5.29
2.2	4.84
2.9	8.41
3.4	11.58
2.7	7.29
2.9	8.41
2.2	4.84
1.9	3.61
1.2	1.44
2.3	5.29
4.8	23.04
11.7	136.89
$\Sigma X$	159
$\Sigma X^2$	2426.58

Variance, S<sup>2</sup> = 6.43

$$S = \sqrt{\frac{16(228.34) - (46)^2}{16(15)}} = \sqrt{\frac{3659.84 - 2116}{240}} = \sqrt{\frac{1543.84}{240}} = \sqrt{6.43} = 2.54$$

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$$S = \sqrt{\frac{16(2426.58) - 159^2}{16(15)}} = \sqrt{\frac{38830.08 - 25281}{240}} = \sqrt{\frac{13549.08}{240}} = \sqrt{56.45} = 7.51$$