

MAN 128 1.0 Introduction to Statistics

Tutorial 1

Descriptive Statistics

1. The following scores represent the final examination grade for an elementary statistics course:

23 60 79 32 57 74 52 70 82 36
80 77 81 95 41 65 92 85 55 76
52 10 64 75 78 25 80 98 81 67
41 71 83 54 64 72 88 62 74 43
60 78 89 76 84 48 84 90 15 79
34 67 17 82 69 74 63 80 85 61

Using 10 class intervals with the lowest starting at 9:

- Set up a frequency distribution.
 - Construct a cumulative frequency distribution.
 - Construct a frequency histogram.
 - Construct a smoothed cumulative frequency polygon.
 - Estimate the number of people who made a score of at least 60 but less than 75.
 - Discuss the skewness of the distribution.
2. In four attempts it took a person 48, 55, 51 and 50 minutes to do a certain job.
- Find the mean, the range, and the standard deviation of these four sample values.
 - Subtract 20 minutes from each of the times, recalculate the mean, the range, and the standard deviation, and compare the results with those obtained in part(a).
 - Multiply each of the sample values by 2, recalculate the mean, the range, and the standard deviation, and compare the results with those obtained in part(a).
 - In general, what effect does (1) adding a constant to each sample value, and (2) multiplying each sample value by a positive constant, have on the mean, the range, and the standard deviation of a sample?
3. In a factory, the time during working hours in which a machine is not operating as a result of breakage or failure is called the ‘downtime’. The following distribution shows a sample of 100 downtimes of a certain machine (rounded to the nearest minute):

Downtime Frequencies	
0 – 9	3
10 – 19	13
20 – 29	30
30 – 39	25
40 – 49	14
50 – 59	8
60 – 69	4
70 – 79	2

With reference to the above distribution, calculate

- (a) the mean.
- (b) the standard deviation.
- (c) the median.
- (d) the quartiles Q1 and Q3.
- (e) the deciles D1 and D9.
- (f) the mode.
- (g) Pearson's coefficient of skewness.
- (h) Bowley's coefficient of Skewness

4. ABC Air Line requires that all resistors used in electronic packages assembled for flight have a coefficient of variation less than 5 percent. The following resistors made by the DEF Company have been tested with results as follows:

Resistor	Mean Resistance (K-ohms)	Standard Deviation (K-ohms)
A	100	4
B	200	12
C	300	14
D	400	16
E	500	18
F	600	20

Which of the resistors meets specifications?

5. Consider the following frequency distribution.

Group	Sub Group	Frequency
A	A1	5
	A2	15
B	B1	10
	B2	20
C	C1	10
	C2	20
	C3	30
D	D1	20
	D2	20
E	E1	15
	E2	15

- (a) Draw a pie chart considering Groups.
- (b) Draw a suitable bar chart considering Groups and Sub Groups.