(1) The following are the estimated oil reserves, in billions of barrels, for four regions in the Western Hemisphere:
United States 38.7
South America 22.6
Canada 8.8
Mexico 60.0
Represent these data in a pie chart.

(2) The following are the percentages of ash content in 12 samples of coal found in close proximity:

9.2, 14.1, 9.8, 12.4, 16.0, 12.6, 22.7, 18.9, 21.0, 14.5, 20.4, 16.9

Find the
a. sample mean, and
b. sample standard deviation of these percentages.

(3) The sample mean and sample variance of five data values are, respectively, $\bar{x} = 104$ and $s^2 = 16$. If three of the data values are $102, 100, 105$, what are the other two data values?

(4) The following data represent the lifetimes (in hours) of a sample of 40 transistors:
112, 121, 126, 108, 141, 104, 136, 134
121, 118, 143, 116, 108, 122, 127, 140
113, 117, 126, 130, 134, 120, 131, 133
118, 125, 151, 147, 137, 140, 132, 119
110, 124, 132, 152, 135, 130, 136, 128
a. Determine the sample mean, median, and mode.
b. Give a cumulative relative frequency plot of these data.
c. Compute the sample mean and sample median.
d. Are the data approximately symmetric?

(5) An experiment measuring the percent shrinkage on drying of 50 clay specimens produced the following data:
18.2 21.2 23.1 18.5 15.6
20.8 19.4 15.4 21.2 13.4
16.4 18.7 18.2 19.6 14.3
16.6 24.0 17.6 17.8 20.2
17.4 23.6 17.5 20.3 16.6
19.3 18.5 19.3 21.2 13.9
20.5 19.0 17.6 22.3 18.4
21.2 20.4 21.4 20.3 20.1
19.6 20.6 14.8 19.7 20.5
18.0 20.8 15.8 23.1 17.0
a. Draw a stem and leaf plot of these data.
b. Compute the sample mean, median, and mode.
c. Compute the sample variance.
d. Group the data into class intervals of size 1 percent starting with the value 13.0, and draw the resulting histogram.

(6) Use the data of Table below to find the
a. 90 percentile of the average temperature for January;
b. 75 percentile of the average temperature for July.

Normal Daily Minimum Temperature — Selected Cities

In Fahrenheit degrees. Airport data except as noted. Based on standard 30-year period, 1961 through 1990

State	Station	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual avg.
AL	Mobile	40.0	42.7	50.1	57.1	64.4	70.7	73.2	72.9	68.7	57.3	49.1	43.1	57.4
AK	Juneau	19.0	22.7	26.7	32.1	38.9	45.0	48.1	47.3	42.9	37.2	27.2	22.6	34.1
AZ	Phoenix	41.2	44.7	48.8	55.3	63.9	72.9	81.0	79.2	72.8	60.8	48.9	41.8	59.3
AR	Little Rock	29.1	33.2	42.2	50.7	59.0	67.4	71.5	69.8	63.5	50.9	41.5	33.1	51.0
CA	Los Angeles	47.8	49.3	50.5	52.8	56.3	59.5	62.8	64.2	63.2	59.2	52.8	47.9	55.5
	Sacramento	37.7	41.4	43.2	45.5	50.3	55.3	58.1	58.0	55.7	50.4	43.4	37.8	48.1
	San Diego	48.9	50.7	52.8	55.6	59.1	61.9	65.7	67.3	65.6	60.9	53.9	48.8	57.6
	San Francisco	41.8	45.0	45.8	47.2	49.7	52.6	53.9	55.0	55.2	51.8	47.1	42.7	49.0
CO	Denver	16.1	20.2	25.8	34.5	43.6	52.4	58.6	56.9	47.6	36.4	25.4	17.4	36.2
CT	Hartford	15.8	18.6	28.1	37.5	47.6	56.9	62.2	60.4	51.8	40.7	32.8	21.3	39.5
DE	Wilmington	22.4	24.8	33.1	41.8	52.2	61.6	67.1	65.9	58.2	45.7	37.0	27.6	44.8
DC	Washington	26.8	29.1	37.7	46.4	56.6	66.5	71.4	70.0	62.5	50.3	41.1	31.7	49.2
FL	Jacksonville	40.5	43.3	49.2	54.9	62.1	69.1	71.9	71.8	69.0	59.3	50.2	43.4	57.1
	Miami	59.2	60.4	64.2	67.8	72.1	75.1	76.2	76.7	75.9	72.1	66.7	61.5	69.0
GA	Atlanta	31.5	34.5	42.5	50.2	58.7	66.2	69.5	69.0	63.5	51.9	42.8	35.0	51.3
HI	Honolulu	65.6	65.4	67.2	68.7	70.3	72.2	73.5	74.2	73.5	72.3	70.3	67.0	70.0
ID	Boise	21.6	27.5	31.9	36.7	43.9	52.1	57.7	56.8	48.2	39.0	31.1	22.5	39.1
IL	Chicago	12.9	17.2	28.5	38.6	47.7	57.5	62.6	61.6	53.9	42.2	31.6	19.1	39.5
	Peoria	13.2	17.7	29.8	40.8	50.9	60.7	65.4	63.1	55.2	43.1	32.5	19.3	41.0
IN	Indianapolis	17.2	20.9	31.9	41.5	51.7	61.0	65.2	62.8	55.6	43.5	34.1	23.2	42.4
IA	Des Moines	10.7	15.6	27.6	40.0	51.5	61.2	66.5	63.6	54.5	42.7	29.9	16.1	40.0
KS	Wichita	19.2	23.7	33.6	44.5	54.3	64.6	69.9	67.9	59.2	46.6	33.9	23.0	45.0
KY	Louisville	23.2	26.5	36.2	45.4	54.7	62.9	67.3	65.8	58.7	45.8	37.3	28.6	46.0
LA	New Orleans	41.8	44.4	51.6	58.4	65.2	70.8	73.1	72.8	69.5	58.7	51.0	44.8	58.5
ME	Portland	11.4	13.5	24.5	34.1	43.4	52.1	58.3	57.1	48.9	38.3	30.4	17.8	35.8
MD	Baltimore	23.4	25.9	34.1	42.5	52.6	61.8	66.8	65.7	58.4	45.9	37.1	28.2	45.2
MA	Boston	21.6	23.0	31.3	40.2	49.8	59.1	65.1	64.0	56.8	46.9	38.3	26.7	43.6
MI	Detroit	15.6	17.6	27.0	36.8	47.1	56.3	61.3	59.6	52.5	40.9	32.2	21.4	39.0
	Sault Ste. Marie	4.6	4.8	15.3	28.4	38.4	45.5	51.3	51.3	44.3	36.2	25.9	11.8	29.8
MN	Duluth	−2.2	2.8	15.7	28.9	39.6	48.5	55.1	53.3	44.5	35.1	21.5	4.9	29.0
	Minneapolis-St. Paul	2.8	9.2	22.7	36.2	47.6	57.6	63.1	60.3	50.3	38.8	25.2	10.2	35.3
MS	Jackson	32.7	35.7	44.1	51.9	60.0	67.1	70.5	69.7	63.7	50.3	42.3	36.1	52.0
MO	Kansas City	16.7	21.8	32.6	43.8	53.9	63.1	68.2	65.7	56.9	45.7	33.6	21.9	43.7
	St. Louis	20.8	25.1	35.5	46.4	56.0	65.7	70.4	67.9	60.5	48.3	37.7	26.0	46.7
MT	Great Falls	11.6	17.2	22.8	31.9	40.9	48.6	53.2	52.2	43.5	35.8	24.3	14.6	33.1

Source: U.S. National Oceanic and Atmospheric Administration, Climatography of the United States, No. 81.

(7) Find the quartiles of the following ages at death as given in obituaries of the New York Times in the 2 weeks preceding 1 August 2013. Then, represent the data in a box plot.
92, 90, 92, 74, 69, 80, 94, 98, 65, 96, 84, 69, 86, 91, 88, 74, 97, 85, 88, 68,
77, 94, 88, 65, 76, 75, 60, 69, 97, 92, 85, 70, 80, 93, 91, 68, 82, 78, 89

(8) Tablet PC Comparison provides a wide variety of information about tablet computers. Their website enables consumers to easily compare different tablets using factors such as cost, type of operating system, display size, battery life, and CPU manufacturer. A sample of 10 tablet computers is shown in the following Table.

[redacted] Product Information for 10 Tablet Computers

Tablet	Cost ($)	Operating System	Display Size (inches)	Battery Life (hours)	CPU Manufacturer
Acer Iconia W510	599	Windows	10.1	8.5	Intel
Amazon Kindle Fire HD	299	Android	8.9	9	TI OMAP
Apple iPad 4	499	iOS	9.7	11	Apple
HP Envy X2	860	Windows	11.6	8	Intel
Lenovo ThinkPad Tablet	668	Windows	10.1	10.5	Intel
Microsoft Surface Pro	899	Windows	10.6	4	Intel
Motorola Droid XYboard	530	Android	10.1	9	TI OMAP
Samsung Ativ Smart PC	590	Windows	11.6	7	Intel
Samsung Galaxy Tab	525	Android	10.1	10	Nvidia
Sony Tablet S	360	Android	9.4	8	Nvidia

a. How many elements are in this data set?
b. How many variables are in this data set?
c. Which variables are categorical and which variables are quantitative?
d. What type of measurement scale is used for each of the variables?
e. What is the average cost for the tablets?
f. Compare the average cost of tablets with a Windows operating system to the average cost of tablets with an Android operating system.
g. What percentage of tablets use a CPU manufactured by TI OMAP?
h. What percentage of tablets use an Android operating system?

(9) The average particulate concentration, in micrograms per cubic meter, was measured in a petrochemical complex at 36 randomly chosen times, with the following concentrations resulting:
5, 18, 15, 7, 23, 220, 130, 85, 103, 25, 80, 7, 24, 6, 13, 65, 37, 25,
24, 65, 82, 95, 77, 15, 70, 110, 44, 28, 33, 81, 29, 14, 45, 92, 17, 53
a. Represent the data in a histogram.
b. Is the histogram approximately symmetric?

(10) A chemical engineer desiring to study the evaporation rate of water from brine evaporation beds obtained data on the number of inches of evaporation in each of 55 July days spread over 4 years. The data are given in the following stem and leaf plot, which shows that the smallest data value was .02 inch, and the largest .56 inch.

.0 2, 6
.1 1, 4
.2 1, 1, 1, 3, 3, 4, 5, 5, 5, 6, 9
.3 0, 0, 2, 2, 2, 3, 3, 3, 3, 4, 4, 5, 5, 5, 6, 6, 7, 8, 9
.4 0, 1, 2, 2, 2, 3, 4, 4, 4, 5, 5, 5, 7, 8, 8, 8, 9, 9
.5 2, 5, 6

Find the
a. sample mean;
b. sample median;
c. sample standard deviation of these data.
d. Do the data appear to be approximately symmetric?
e. What percentage of data values are within 1 standard deviation of the mean?

(11) Many service companies collect data via a follow-up survey of their customers. For example, to ascertain customer sentiment, Turkish Air Lines sends an e-mail to customers immediately following a flight. Among other questions, Turkish Air Lines asks:
How likely are you to recommend Turkish Air Lines to others?

The possible responses are:

(a) Definitely Will (b) Probably Will (c) May or May Not Will
(d) Probably Will Not (e) Definitely Will Not

a. Are the data collected by Turkish Air Lines in this example quantitative or categorical?

b. What measurement scale is used?

(12) The following are the grade point averages of 30 students recently admitted to the graduate program in the Department of Industrial Engineering and Operations Research at the University of California at Berkeley.

3.46, 3.72, 3.95, 3.55, 3.62, 3.80, 3.86, 3.71, 3.56, 3.49, 3.96, 3.90, 3.70, 3.61, 3.72, 3.65, 3.48, 3.87, 3.82, 3.91, 3.69, 3.67, 3.72, 3.66, 3.79, 3.75, 3.93, 3.74, 3.50, 3.83

a. Represent the preceding data in a stem and leaf plot.

b. Calculate the sample mean $\bar{x}$.

c. Calculate the sample standard deviation s.

d. Determine the proportion of the data values that lies within $\bar{x} \mp 1.5s$.

e. Determine the proportion of the data values that lies within $\bar{x} \mp 2s$.

(13) The following are the heights and starting salaries of 12 law school classmates whose law school examination scores were roughly the same.

Height	Salary
64	91
65	94
66	88
67	103
69	77
70	96
72	105
72	88
74	122
74	102
75	90
76	114

a. Represent these data in a scatter diagram.

b. Find the sample correlation coefficient.

(14)