1. Given the data

0.90	1.42	1.30	1.55	1.63
1.32	1.35	1.47	1.95	1.66
1.96	1.47	1.92	1.35	1.05
1.85	1.74	1.65	1.78	1.71
2.29	1.82	2.06	2.14	1.27

Determine **(a)** the mean, **(b)** median, **(c)** mode, **(d)** range, **(e)** standard deviation, **(f)** variance, and **(g)** coefficient of variation.

2. Construct a histogram from the data from Prob. 1. Use a range from 0.8 to 2.4 with intervals of 0.2.

3. In water-resources engineering, the sizing of reservoirs depends on accurate estimates of water flow in the river that is being impounded. For some rivers, long-term historical records of such flow data are difficult to obtain. In contrast, meteorological data on precipitation are often available for many years past. Therefore, it is often useful to determine a relationship between flow and precipitation. This relationship can then be used to estimate flows for years when only precipitation measurements were made. The following data are available for a river that is to be dammed:

Precip., cm/yr	88.9	108.5	104.1	139.7	127	94	116.8	99.1
Flow, m^3/s	14.6	16.7	15.3	23.2	19.5	16.1	18.1	16.6

(a) Plot the data.
(b) Fit a straight line to the data with linear regression. Superimpose this line on your plot.
(c) Use the best-fit line to predict the annual water flow if the precipitation is 120 cm.
(d) If the drainage area is 1100 km^2, estimate what fraction of the precipitation is lost via processes such as evaporation, deep groundwater infiltration, and consumptive use.

4. The table below shows the 2015 world record times and holders for outdoor running. Note that all but the 100 m and the marathon (42,195 m) are run on oval tracks. Fit a power model for each gender and use it to predict the record time for a half marathon (21,097.5 m). Note that the actual records for the half marathon are 3503 s (Tadese) and 3909 s (Kiplagat) for men and women, respectively.

Event (m)	Time (s)	Men Holder	Time (s)	Women Holder
100	9.58	Bolt	10.49	Griffith-Joyner
200	19.19	Bolt	21.34	Griffith-Joyner
400	43.18	Johnson	47.60	Koch
800	100.90	Rudisha	113.28	Kratochvilova
1000	131.96	Ngeny	148.98	Masterkova
1500	206.00	El Guerrouj	230.07	Dibaba
2000	284.79	El Guerrouj	325.35	O'Sullivan
5000	757.40	Bekele	851.15	Dibaba
10,000	1577.53	Bekele	1771.78	Wang
20,000	3386.00	Gebrselassie	3926.60	Loroupe
42,195	7377.00	Kimetto	8125.00	Radcliffe