An engineer needs a program to process historical earthquake intensity data for a project site. The data is contained in a file, with one number per line. The data is expressed using the Richter scale, which is a floating point number ranging from 1.0 to 8.9 (one digit to the right of the decimal point). The engineer wants the program designed and written by you so that she can specify the name of the data file while the program is running. The program must determine the mean and variance of the observed earthquake intensities, and the three most commonly occurring earthquake intensities in the data set. The engineer needs the program for a number of different sites, each with different number of observations, however she does know that the maximum number of observations that the program will need to process is 10,000. The mean and variance of the data should be determine in a subroutine. The mean and variance can be computed using the equations

\[
\text{Mean} = \frac{\sum_{i=1}^{n} x_i}{n}
\]

\[
\text{Variance} = \frac{\sum_{i=1}^{n} (x_i - \text{Mean})^2}{n - 1}
\]

The variance can also be computed in a more computationally efficient fashion using the equation

\[
\text{Variance} = \frac{\sum_{i=1}^{n} x_i^2 - (\sum_{i=1}^{n} x_i)^2 / n}{n - 1}
\]

Write your subroutine so that the variance is computed both ways. Your program should print out the mean, both computed values of the variance, and the three most commonly occurring values. Briefly describe the differences between the two methods to compute the variance and any differences you find in the values computed for the data in file /class-files/finney/earthquake.dat.