Sampling People, Networks and Records
Week 2 Quiz: Problem Set

Please input your answers for the following problems via the Coursera course site: https://www.coursera.org/learn/sampling-methods.

For the following sample values of salaries from a simple random sample of $n = 20$ faculty selected from $N = 150$, compute the specified statistics.

103, 55, 61, 77, 58, 60, 57, 64, 57, 79, 52, 39, 46, 55, 29, 40, 47, 103, 56, 118

1) The sum, $\sum_{i=1}^{20} y_i = (103+55+\ldots)$.
2) The mean, $\bar{y} = \frac{1}{n}\sum_{i=1}^{20} y_i = \frac{1}{20}(103+55+\ldots)$.
3) The sampling fraction, $f = \frac{n}{N}$.
4) The finite population correction, $\left(1-\frac{n}{N}\right) = (1-f)$, where f is the sampling fraction computed in 2 c) above.
5) The sum of squared deviations, $\sum_{i=1}^{20}(y_i-\bar{y})^2 = (103-\bar{y})^2 + (55-\bar{y})^2 + \ldots$, where $\bar{y}$ is the mean computed in 2 b) above.
6) The sample variance, $s^2 = \left(\frac{1}{n-1}\right)\sum_{i=1}^{20}(y_i-\bar{y})^2 = \left(\frac{1}{20-1}\right)\left((103-\bar{y})^2 + (55-\bar{y})^2 + \ldots\right)$.
7) The sampling variance of the mean, $v(\bar{y}) = (1-f)\frac{s^2}{n} = \left(1-\frac{20}{150}\right)\frac{s^2}{20}$, where s^2 is the sample variance computed in 2 f) above.
8) The standard error of the mean, $se(\bar{y}) = \sqrt{v(\bar{y})}$, where v(…) is computed in 2 g) above.
9) The margin of error, $2 \times se(\bar{y})$, where se(…) is computed in 2 h) above.
10) We know for the population of faculty that S^2 is 735, and we wanted a standard error of 4 (to give a margin of error of 2 x \$4 = \$8), what simple random sample size would be needed?