CHAPTER 8
DISCUSSION 1

1. The head librarian at the Library of Congress has asked her assistant for an interval estimate of the mean number of books checked out each day. The assistant provides the following interval estimate: from 740 to 920 books per day. What is a point estimate of the number of books checked out each day at the Library of Congress?
    a) 740
    b) 830
    c) 920
    d) 1,660

2. Suppose a 95% confidence interval for μ turns out to be (1000, 2100). To make more useful inferences from the data, it is desired to reduce the width of the confidence interval. Which of the following will result in a reduced interval width?
    a) Increase the sample size.
    b) Increase the confidence level.
    c) Increase the population mean.
    d) Increase the sample mean.

3. In the construction of confidence intervals, if all other quantities are unchanged, an increase in the sample size will lead to an interval:
    a) narrower
    b) wider
    c) less significant
    d) biased

4. An economist is interested in studying the incomes of consumers in a particular country. The population standard deviation is known to be $1,000. A random sample of 50 individuals resulted in a mean income of $15,000. What is the upper end point in a 99% confidence interval for the average income?
    a) $15,052
    b) $15,141
    c) $15,330
    d) $15,364

5. An economist is interested in studying the incomes of consumers in a particular country. The population standard deviation is known to be $1,000. A random sample of 50 individuals resulted in a mean income of $15,000. What is the width of the 90% confidence interval?
    a) $232.60
    b) $364.30
    c) $465.23
    d) $728.60

6. If you were constructing a 99% confidence interval of the population mean based on a sample of n=25 where the standard deviation of the sample S = 0.05, the critical value of t will be
    a) 2.7969
    b) 2.7874
    c) 2.4922
    d) 2.4851

7. Suppose a 95% confidence interval for μ turns out to be (1000, 2100). Give a definition of what it means to be "95% confident" as an inference.
    a) In repeated sampling, the population parameter would fall in the given interval 95% of the time.
    b) In repeated sampling, 95% of the intervals constructed would contain the population mean.
    c) 95% of the observations in the entire population fall in the given interval.
    d) 95% of the observations in the sample fall in the given interval.

8. A major department store chain is interested in estimating the mean amount its credit card customers spent on their first visit to the chain's new store in the mall. Fifteen credit card accounts were randomly sampled and analyzed with the following results: *X-bar* =$50.50 and *S*=20. Assuming the distribution of the amount spent on their first visit is normal, what is the shape of the sampling distribution of the sample mean that will be used to create the desired confidence interval for μ?
    a) Approximately normal with a mean of $50.50
    b) A standard normal distribution
    c) A *t* distribution with 15 degrees of freedom
    d) A *t* distribution with 14 degrees of freedom

9. A major department store chain is interested in estimating the mean amount its credit card customers spent on their first visit to the chain's new store in the mall. Fifteen credit card accounts were randomly sampled and analyzed with the following results: *X-bar* =$50.50 and *S* = 20. Construct a 95% confidence interval for the mean amount its credit card customers spent on their first visit to the chain's new store in the mall assuming that the amount spent follows a normal distribution.
    a) $50.50 ± $9.09
    b) $50.50 ± $10.12
    c) $50.50 ± $11.00
    d) $50.50 ± $11.08

10. Private colleges and universities rely on money contributed by individuals and corporations for their operating expenses. Much of this money is put into a fund called an endowment, and the college spends only the interest earned by the fund. A recent survey of 8 private colleges in the United States revealed the following endowments (in millions of dollars): 60.2, 47.0, 235.1, 490.0, 122.6, 177.5, 95.4, and 220.0. Summary statistics yield *X-bar* = 180.975and *S* =143.042. Calculate a 95% confidence interval for the mean endowment of all the private colleges in the United States assuming a normal distribution for the endowments.
    a) $180.975±$94.066
    b) $180.975±$99.123
    c) $180.975±$116.621
    d) $180.975±$119.586

11. A university dean is interested in determining the proportion of students who receive some sort of financial aid. Rather than examine the records for all students, the dean randomly selects 200 students and finds that 118 of them are receiving financial aid. Use a 90% confidence interval to estimate the true proportion of students who receive financial aid.

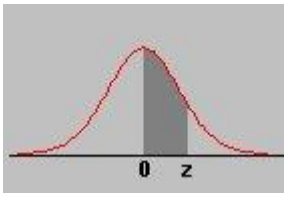
12. The county clerk wants to estimate the proportion of voters who will need special election facilities. The clerk wants to construct a 95% confidence interval for the population proportion which extends at most 0.07 to either side of the sample proportion. How large a sample must be taken to assure these conditions are met?

13. When determining the sample size necessary for estimating the true population mean, which factor is **not** considered when sampling *with* replacement?
    a) The population size.
    b) The population standard deviation.
    c) The level of confidence desired in the estimate.
    d) The allowable or tolerable sampling error.

14. An economist is interested in studying the incomes of consumers in a particular country. The population standard deviation is known to be $1,000. A random sample of 50 individuals resulted in a mean income of $15,000. What total sample size would the economist need to use for a 95% confidence interval if the width of the interval should not be more than $100?
    a) $n = 1537$
    b) $n = 385$
    c) $n = 40$
    d) $n = 20$

15. The head librarian at the Library of Congress has asked her assistant for an interval estimate of the mean number of books checked out each day. The assistant provides the following interval estimate: from 740 to 920 books per day. If the head librarian knows that the population standard deviation is 150 books checked out per day, and she asked her assistant for a 95% confidence interval, approximately how large a sample did her assistant use to determine the interval estimate?
    a) 125
    b) 13
    c) 11
    d) 4

Area between 0 and z



	0.00	**0.01**	**0.02**	**0.03**	**0.04**	**0.05**	**0.06**	**0.07**	**0.08**	**0.09**
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990