

Statistics 2500, Section 001
Assignment #3: Week of Oct. 26, 2009
Due on or before: Thursday, Nov. 19, 2009: 5pm

- The use of Minitab is **required** in the questions indicated. If you think you can use it in other questions, feel free to do so.
- Please **staple** the pages of your assignment together.
- Write your **name, ID number, lab instructor's name** and **day and time** you attend lab on your assignment.
- Assignments are to be passed into the assignment boxes located just to the left of the math/stats department's general office (HH-3003). Please put your assignment in the box that has your lab instructor's name on it:

Melissa (Mon. 9am, 10:30am): **BOX 1**

Vineetha (Mon. 3:30pm, Tues., Thurs. 1:50pm): **BOX 2**

Chithran (Wed. 9am, 10:30am): **BOX 3**

Hubert (Fri. 9am, 10:30am): **BOX 4**

Yunqi (Fri. 2pm): **BOX 5**

- All problem numbers are taken from the textbook *Elementary Statistics* by Bluman and Mayer.

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1. A survey found that 64% of people under age 18 owned an iPod. A random sample of 277 people under age 18 is selected.
 - (a) **Use Minitab** to find the probability that more than 160, but less than 180, people under age 18 owned an iPod. **PASS IN THE RELEVANT MINITAB OUTPUT.**
 - (b) **Use Minitab** to find the probability that at least 156 people under age 18 owned an iPod. **PASS IN THE RELEVANT MINITAB OUTPUT.**
 2. The number of loaves of white bread demanded daily at a bakery is normally distributed with mean 6800 loaves and variance 84000. The company decides to produce a sufficient number of loaves so that it will fully supply demand on 95% of all days.
 - (a) How many loaves of bread should the company produce?
 - (b) Based on (a), on what percentage of days will the company be left with more than 500 loaves of unsold bread?

3. A brand of spark plugs has an average lifespan of 84000km and a standard deviation of 13000km. What is the (approximate) probability that the average life for a random sample of 51 spark plugs will be between 80000km and 85000km?
4. Using the data in #16, p. 289, answer the following (**create the plots using Minitab, and pass in the plots**):
 - (a) Construct a histogram of the data. Based on this plot, does it appear the data come from a normal distribution? Explain.
 - (b) Construct a QQ-plot of the data. Based on this plot, does it appear the data come from a normal distribution? Explain.
5. A study of 400 kindergarten students showed that they had seen on average 5000 hours of television. If the sample standard deviation is 1000, find the 94% confidence interval of the mean hours of TV for all kindergarten students. If a parent claimed that his children watched 4000 hours, would the claim be believable?
6. #25, p. 307, **but change “within \$150” to “within \$180”**.
7. #12, p. 312.
8. #17, p. 312 **using Minitab**. Repeat this problem was repeated using a 98% confidence interval. Which interval (98% or 95%) is narrower? **Pass in the relevant Minitab output**.
9. #12, p. 319. **BUT, OMIT THE PART OF THE QUESTION STARTING WITH** *If the cafeteria manager . . .*
10. An Oct. 2009 national poll found that, in a random sample of 3320 Canadian voters, 890 favoured the federal Liberal party. Find a 99% confidence interval for the proportion of all Canadian voters that favour the federal Liberal party.
11. The company that makes *Tide* feels that university students do as little laundry as possible (imagine that!). They want to construct a confidence interval for the fraction of college students who do laundry once a week.
 - (a) How large a sample do they need to use if they want to construct a 90% confidence interval that is accurate within 3%?
 - (b) How large a sample do they need to use if they want to construct a 96% confidence interval that is accurate within 3%? How does this result compare to (a)?
 - (c) How large a sample do they need to use if they want to construct a 90% confidence interval that is accurate within 2%? How does this result compare to (a)?
12. #13, p. 346. **NOTE: In (a)–(c), (f) and (g), take “is” to be “is not”**.
13. #4, p. 355. Also find the p-value.