Lab 6 – The normal distribution & one sample t-tests
Sakai Question/Answer key

1. For any variable, the width of the sampling distribution of the mean is always more narrow than the width of the population frequency distribution.
2. The width of the distribution of sample means increases when: Sample size is decreased and when Population standard deviation is increased.
3. When sampling from a normal population (e.g. the fish), the sampling distribution is not normal if the sample size is small (n<4). False
4. The mean of a sampling distribution always equals the mean of the original distribution. True
5. The sampling distribution of coffee consumption closely resembles a normal distribution at what sample size? 0.03
6. A negative Z score indicates: The observed value falls below the mean.
7. According to the case summaries table, the observed bieth weight that is closest to the mean is 2948 g. The observed birth weight that is the closest to 1 standard deviation away from the mean is 2211 g. From these values, we could estimate the standard deviation to be 737 g.
8. The highest birth weight in this sample of babies is 4990 g, which is equal to approximately 11 lb. According to Z standardization, what is the probability that a randomly selected newborn baby in this population would have a birth weight greater than 11 lb? 0.0026
9. A) The probability that the temperature never exceeds 120 degrees F in a given July in Death Valley is 0.109.
   B) The probability that the temperature goes above 128 degrees F during July in a randomly chosen year is 0.089.
10. The probability that the highest recorded temperature will be between 128 and 130 degrees F is: 0.066.
11. The mean age on the titanic is significantly different from 18-years-old. True
12. The mean age on the titanic was 31.19 with a 95% confidence interval lower bound of 30.04 and an upper bound of 32.35.
13. Passenger class and survival on the Titanic are independent. False
14. There is a statistically significant association between gender and survival on the Titanic. True
15. The difference in mosquito biting before and after treatment is statistically significant and suggests that more mosquitos bite a person when they are uninfected than when they have malaria. False
16. The data are consistent with there being a decrease in soil lead content following the hurricanes.

17. The P-value for the one-sample t-test conducted on the change in soil lead (using the log ratio) is 0.0024.
18. According to the data on the concentration of lead in the blood before and after hurricanes Rita and Katrina, the null hypothesis that there is no change in blood lead concentration is rejected. Blood lead concentration decreased following the hurricanes.
19. The mean birth weight observed in the 1986 Springfield Massachusetts data set is significantly different from the hypothesized mean value according to current Canadian data. True
20. A) The 95% confidence interval for mean birth weight for mothers who did not smoke is: $2916.66 < \mu < 3194.73$.
    B) The 95% confidence interval for mean birth weight for mothers who smoked is: $2619.09 < \mu < 2924.74$.
21. There is a statistically significant association between low birth weight and the presence of uterine irritability in the mother. According to a chi square test, 14 mothers had both uterine irritability and low birth weight infants, whereas only 8.7 would be expected if the two variables were independent. True
22. According to the computed Z scores for cat body weight and the Z distribution statistical table, what is the probability that a randomly selected cat is between 9 and 10 lbs? 0.309
23. Which variables in the General Mills data set are significantly different from the expected values according to the larger survey of US breakfast cereals? Check all that apply. Protein and Fibre

No calculations on SPSS were required.