Part II: Free Response

Directions: Show all your work. Indicate clearly the methods you use, because you will be grade on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

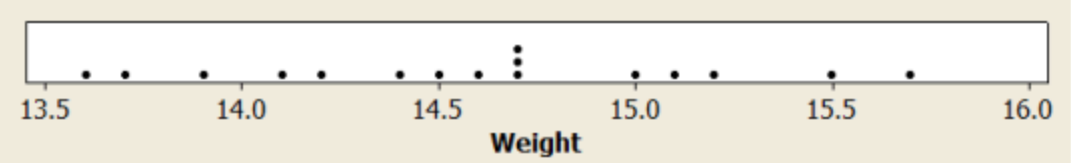
1. The student council at James Logan High School (a very large high school) wants to know what proportion of the student body favors banning plastic water bottles from the school buildings and grounds. A simple random sample of 152 students finds that 85 support banning plastic bottles.
    a. Construct and interpret a 95% confidence interval for the proportion of students at James Logan High School who support banning plastic water bottles. **[9pts]**

    b. The student council will ban the bottles if they are convinced that the majority (at least 51%) of students favor it. Does this confidence interval from part (a) provide evidence for a ban? Explain. **[2pts]**

    c. It turns out that the council's simple random sample was originally 165 students, but 13 individuals in the sample didn't respond because they were on an AP Biology field trip. Could this change your answer to part (b)? Explain your reasoning. **[3pts]**

2. We're All Nuts, Inc. sells bags of cashews that are advertised as holding 15 oz. of nuts. The quality control manager at the manufacturing plant is responsible for ensuring that the mean weight of bags is at least 15 oz. Twice a week he takes a random sample of 16 bags (from one day's production - about 10,000 bags)

and weighs the nuts in each bag. One day he finds that the mean weight is 14.6oz with a standard deviation of 0.6oz. Below is a dot plot and table of values of the sample.



13.6	13.7	13.9	14.1	14.2	14.4	14.5	14.6	14.7	14.7
14.7	15.0	15.1	15.2	15.5	15.7				

a. Construct and interpret a 99% confidence interval for the mean weight of cashews in one bag. **[10pts]**

b. Based on your interval, is there evidence that the manufacturing plant is not meeting their advertised clam? Explain your reasoning. **[3pts]**