1. Fritos $n = 6$ advertised weight $= 35.4$

L1
35.5
35.3
35.1
36.4
35.4
35.5

1 varstats $\bar{x} = 35.53333333$

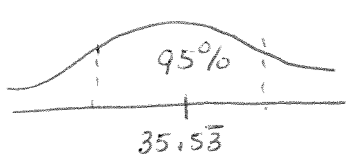
$Sx = 0.45018514 71$ → use t

$$SE = \frac{Sx}{\sqrt{n}} = \frac{0.4501851471}{\sqrt{6}} = 0.1837873167$$

a.) population = average weight of all Fritos bags marked with weight of 35.4 grams. ~~selected 6 at a time~~.

b.) Assume 6 bags selected at random. Assume each bag is independent. Six bags are less than 10% of population. Yes, conditions met.

c.) 95% c-level



$df = 6 - 1 = 5$

$t^* = 2.571$

$t^* * SE + \text{center}$

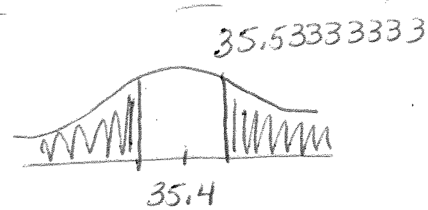
$\pm 2.571 * 0.1837873167 + 35.5\bar{3} = (\cancel{34.86081611}\ 35.06081614,\ \cancel{35.80585049}\ 36.00585052)$

we are 95% confident that the true average weight of all Fritos is between ~~34.86~~ 35.06 and ~~35.81~~ 36.01 grams.

d.) The stated weight of 35.4 grams is inside the interval, thus there is not enough evidence to suggest it is not 35.4 grams

---

If we did a hypothesis test instead:



$H_0: \mu = 35.4$

$H_A: \mu \neq 35.4$ 2-tailed

$$t = \frac{35.5\bar{3} - 35.4}{0.1837873167} = 0.725476232$$

$2 * tcdf(0.725476232, 100, 5) = 0.5006803989 = \text{pvalue}$

Since this is not less than 5%, we do not reject H_0.

There is not enough evidence to suggest that the weight is different from 35.4 grams.

(2.) Computer : $n = 1240$ total $\div 2$ (equal number of girls and boys)

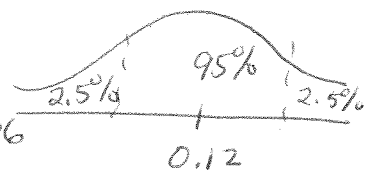
Boys	Girls
77%	65%
$\hat{p}_1 = 0.77$	$\hat{p}_2 = 0.65$ → Use z
$n_1 = 620$	$n_2 = 620$

$$SE = \sqrt{\frac{(0.77)(1-0.77)}{620} + \frac{0.65(1-0.65)}{620}}$$

$SE = 0.025545658$

95% c-level

$\hat{p}_1 - \hat{p}_2 = 0.77 - 0.65 = 0.12$



$z^* = \text{invnorm}(0.025) = -1.959963986$

$z^* * SE + \text{center}$

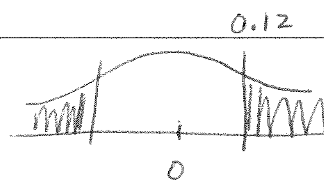
$\pm 1.959963986 * 0.025545658 + 0.12$

$(0.0699314303,\ 0.1700685697)$

We are 95% confident that boys play 7% to 17% more computer games than girls.

- - - - - - - - - - - - -

If hypothesis test:



$H_0: p_1 - p_2 = 0$

$H_A: p_1 - p_2 \neq 0$ two-tailed

$$z = \frac{0.12 - 0}{0.025545658} = 4.697471484$$

$2 * \text{normalcdf}(4.697471484, 100) = 2.637064924 \times 10^{-6} = 0.000002637$ pvalue.

Since this is less than 5%, we reject H_0 in favor of H_A.

There is strong evidence to suggest that boys play more computer games than girls.

3.) Shipping: claim 90% order shipped within 2 days.

~~[illegible]~~ 4000 total

$n = 200$

$x = 168$

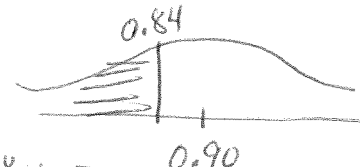
$\hat{p} = \frac{168}{200} = 0.84$ ⟶ use z

$SE = \sqrt{\frac{p(1-p)}{n}}$ OR $\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$

If Hypothesis test: $SE = \sqrt{\frac{0.90(1-0.90)}{200}} = 0.0212132034$

$H_0: p = 0.90$

$H_A: p < 0.90$ one tailed



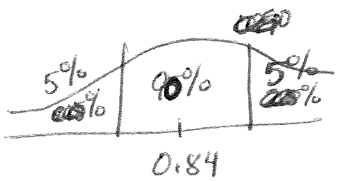
$z = \frac{0.84 - 0.90}{0.0212132034} = -2.828427125$

normalcdf $(-100, -2.828427125) = 0.0023389301$ = pvalue

Since this is less than 5%, we reject H_0 in favor of H_A.

There is strong evidence to suggest that the orders shipped within 2 days is less than 90%.

If Confidence Interval: $SE = \sqrt{\frac{0.84(1-0.84)}{200}} = 0.0259229628$



90% c-level

$z^* = \text{invnorm}(0.05) = -1.644853626$

$z^* \times SE + \text{center}$

$\pm 1.644853626 \times 0.0259229628 + 0.84$

$(0.7973605206, 0.8826394794)$

we are 90% confident that the percent of orders filled in two days is between 79.7% and 88.3%.

Since 90% is not in the interval, there is strong evidence to suggest that it is less than 90%.

(4.) Teach:

Certified	under certified
$\bar{X}_1 = 35.62$	$\bar{X}_2 = 32.48$
$S_{X_1} = 9.31$	$S_{X_2} = 9.43$
$n_1 = 44$	$n_2 = 44$

use $df = 86$

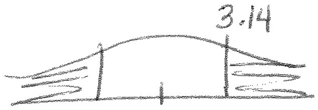
$\rightarrow$ use t

$\bar{X}_1 - \bar{X}_2 = 3.14$

If hypothesis test:

$H_0: \mu_1 - \mu_2 = 0$

$H_A: \mu_1 - \mu_2 \neq 0$ 2-tailed



$$SE = \sqrt{\frac{9.31^2}{44} + \frac{9.43^2}{44}}$$

$SE = 1.997731668$

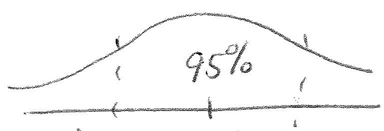
$$t = \frac{35.62 - 32.48 - 0}{1.997731668} = 1.571782662$$

$2 * tcdf(1.571782662, 100, 86) = 0.11967301$

Since not less than 5%, we do not reject Ho.

There is not strong evidence to suggest that there is a difference in reading scores between certified and under-certified teachers.

If confidence interval:



95% c-level row 86 (row 80 is closest)

$t^* = 1.990$

$t^* * SE + center$

$\pm 1.990 * 1.997731668 + 3.14$

$(-0.835486019\text{3}, 7.11548601\text{9})$

We are 95% confident that the difference in reading score is between -0.84 and 7.12. Since zero is in the interval, there is not strong evidence to believe that there is a difference in reading scores.