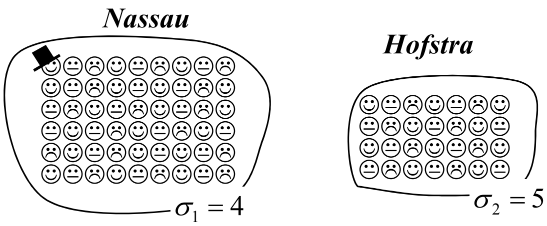
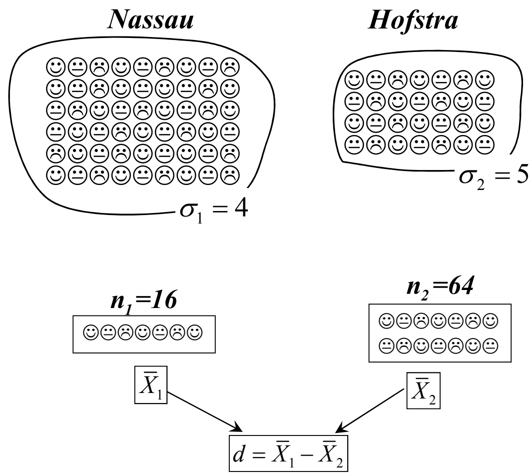
Nassau students do better than Hofstra students.



σ***: known***



H_0 : d = 0 (There is no difference in the scores)

H_a : d > 0 (Nassau scores are higher than Hofstra)

σ***: known***

H_0 : d = 0 (There is no difference in the scores)

H_a : d > 0 (Nassau scores are higher than Hofstra)

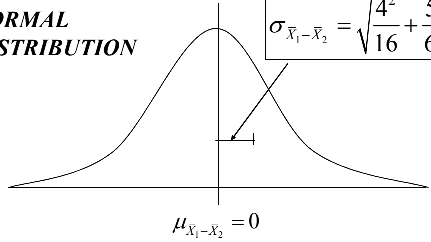
If Ho were true we would expect the distribution of differences of groups of exam scores to be distributed as below (Normal Distribution).

Nassau	*Hofstra*
$\sigma_1 = 4$	$\sigma_2 = 5$
$n_1 = 16$	$n_2 = 64$

$$\sigma_{\overline{X}_1 - \overline{X}_2} = \sqrt{\frac{\sigma_1^{\ 2}}{n_1} + \frac{\sigma_2^{\ 2}}{n_2}}$$

$$\sigma_{\overline{X}_1 - \overline{X}_2} = \sqrt{\frac{4^2}{16} + \frac{5^2}{64}} = 1.179$$

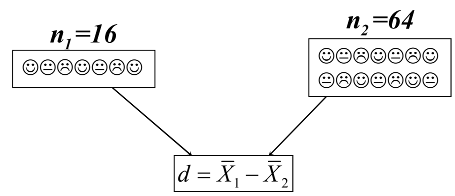
NORMAL DISTRIBUTION



σ***: known***

Exam Results

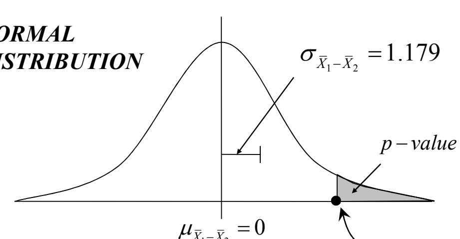
Nassau	***Hofstra***
$\overline{X}_1 = 73$	$\overline{X}_2 = 71$
$\sigma_1 = 4$	$\sigma_2 = 5$



$d = 73 - 71$

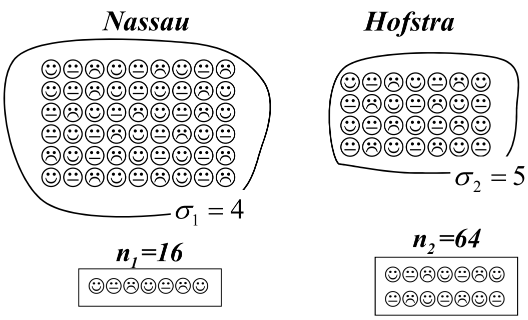
NORMAL DISTRIBUTION

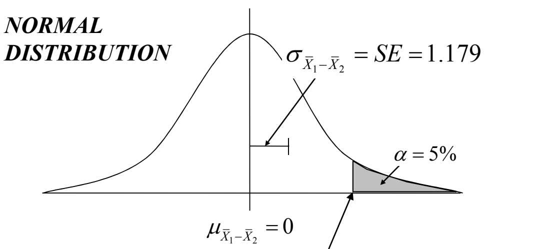
$\alpha = 5\%$



Since the difference in mean scores is 2,
the test statistic is x = (2 – 0)/1.179 = 1.696
The p-value is normalcdf(1.696,E99) = 0.0449.
Since α = 5%, we can reject Ho (that means are equal)

σ: known



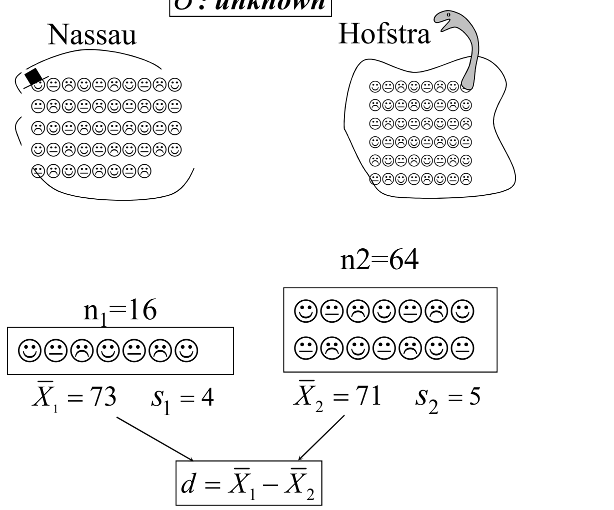


X_{cr} = Critical Value

Z_{cr} = invnorm(.95)=1.65

$X_{cr} = Z_{cr}(\sigma) + \mu =$ (1.65)(1.179) + 0 = 1.95

σ: unknown



H_0 : d = 0 (There is no difference in the scores)

H_a : d > 0 (Nassau scores are higher than Hofstra)

σ: unknown

H_0 : d = 0 (There is no difference in the scores)

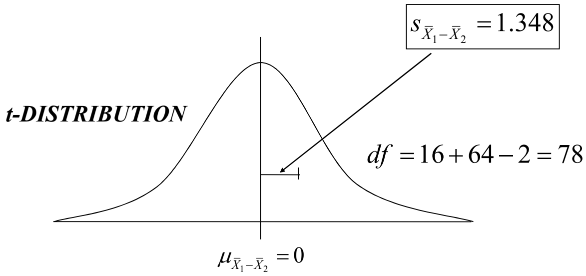
H_a : d > 0 (Nassau scores are higher than Hofstra)

If Ho were true we would expect the distribution of differences of groups of exam scores to be distributed as below (t - Distribution).

Nassau	$s_1 = 4$	$n_1 = 16$
Hofstra	$s_2 = 5$	$n_2 = 64$

$$s_{\bar{X}_1-\bar{X}_2} = \sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2} \cdot \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$

$$s_{\bar{X}_1-\bar{X}_2} = \sqrt{\frac{(16-1)4^2 + (64-1)5^2}{16+64-2} \cdot \left(\frac{1}{16} + \frac{1}{64}\right)}$$

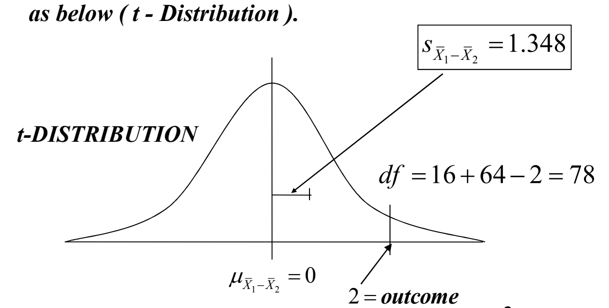


σ: unknown

H_0 : d = 0 (There is no difference in the scores)

H_a : d > 0 (Nassau scores are higher than Hofstra)

If Ho were true we would expect the distribution of differences of groups of exam scores to be distributed as below (t - Distribution).



which has t-score of $\frac{2}{1.348} = 1.484$

p-value = tcdf($\frac{2 - 0}{1.348}$, 10, 78) = .0710

Since p (7.1%) > α (5%), we cannot reject at 5%

But you can use the
2-SampTTest
on the calculator
to do all the calculations...

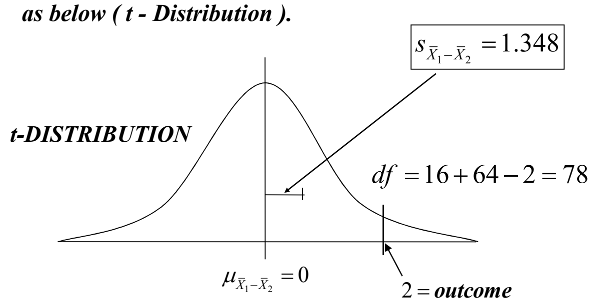
THANK YOU!!!

σ: unknown

H_0 : *d = 0 (There is no difference in the scores)*

H_a : *d > 0 (Nassau scores are higher than Hofstra)*

If Ho were true we would expect the distribution of differences of groups of exam scores to be distributed as below (t - Distribution).



Using the 2-SampTTest on the calculator
X1 = 73 Sx1 = 4 n1 = 16
X2 = 71 Sx2 = 5, n2 = 64,
Pool the std dev's when you assume they are equal.
p = .0710

Page 681 Hypothesis Testing Procedure
to test for the difference of two means

For each of the problems 47 to 52:

a) Define population 1 and population 2.
b) Formulate the null and alternative hypotheses.
c) Calculate the expected results for the hypothesis test assuming the null hypothesis is true and determine the hypothesis test model.
d) Formulate the decision rule.
e) Determine the test statistic.
f) Determine the conclusion and answer the question(s) posed in the problem, if any.

Insecticide Improvement

A new insecticide was developed by a chemical company. The company claims that the new insecticide has a more effective life than their present insecticide. An independent random sample of 40 cans of the new insecticide had a mean effective life of 45 minutes with a standard deviation of 8 minutes.

An independent random sample of 50 cans of the present insecticide had a mean effective life of 42 minutes with a standard deviation of 6 minutes. Do these sample results support the manufacturer's claim, at α = 1%?

Pg 682/50 Driver Differences

An insurance company claims that male drivers under age 25 have more accidents per year than male drivers 25 years of age or older.

An independent sample of size 40 is randomly selected from each age group. The mean number of accidents per year for the male drivers under age 25 was found to be 1.2 with a standard deviation of 0.1 while the mean number of accidents per year for the drivers 25 years of age or older was found to be 0.94 with a standard deviation of 0.2.

Do you believe the claim of the company is correct at α = 5%?

Pg 682/52 Plant Growth

A botanist wants to test whether the new product "Miraculous Growth" would significantly increase the number of flowers per plant over an eight week period.

Two trays of 12 plants were prepared. Tray I received the "Miraculous Growth" during the test period while Tray II served as the control group.

The plants were grown in a controlled environment for this eight week period. At the end of this period, the number of flowers per plant were recorded. The results are summarized in the following table:

Pg 682/52 Plant Growth Experiment

Did the treated group show increased number of flowers per pot than the control group?

Tray 1 (Treatment Group)		Tray 2 (Control Group)	
14	17	12	9
16	19	10	10
20	20	13	15
19	18	14	12
16	17	15	13
15	16	12	14