## 3 2-Proportion Test

- \* when you want to compare two proportions from two different populations. Population 1:
- (P. 4 P2)
  Ha: P1? P2 (D. Rapulation 2:

  Ha: P1? P2 (D. Parameter (P. 4 P2)

  #
- 4) Conditions: Rondom Samp 1 V
  . 10 n, < Pap, V
  . n, p, >10
  n, (1-p,) >10
- · Rondon Samp 2 V · 10n2 < Pop 2 · n2 \( \hat{p}\_2 \ge 2 \to 0 \)

  \( \cap 2 \left( 1 - \hat{p}\_2 \right) \ge 10 \)

Formula: 
$$Z = \frac{(\hat{p}_1 - \hat{p}_2) - (p_2 - p_2)}{(p_1 - p_1)} + \frac{(p_1 - p_2)}{(p_2 - p_2)} + \frac{(p_1 - p_2)}{(p_2 - p_2)}$$

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\* Since our prvalue is less than 5:).

We reject the Ho, which means the evidence suggests the (pi) is less than the (pz).

Words

(3) 2 - Sample 1 Param: ( µ, 4 µ2) 4 Conditions: Random Sompi & Rond. Samp. 2 d long Llop z · 10n, < Pop, n, 230

Joe Smith recently claimed that the proportion of adult males in the U.S with at least two credit cards is different then the proportion of adult females in the U.S with at least two credit cards. He conducted a survey by randomly selecting 100 males and 90 females. Out of 100 males, 71 had at least two credit cards. Out of 90 females, 72 had at least two credit cards. Conduct an appropriate hypothesis test to see if you believe that the

proportion of males is different from the proportion of females?

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Popm: All adult males in the U.S

Pop F: All adult females in the U.S

Param! (Pm & PF) proportion of adults with at least

two credit cards. Ho: Pm = PF

Two Proportion Test

**Ha: Pm ≠ PF

**Random Sampm & Rondom Samp F

**IDNA < Pop M & IONF < Pop F

**IONA < Pop M & IONF < Pop F

**IONA > IONA > IONE > IO
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Std. Error Z-Stat P-value samp Diff PO.0 -\* Since our p-value is greater than 5.1. We fail to reject the which means we did not have enough evidence to say that the proportion of adult males in the U.S with at least two CC's is different from the proportion of adult females in the US A student claims that the average G.P.A at Iowa State University is lower than the average G.P.A at Indiana State University. She goes to each college and randomly selects 60 students from each university. The average G.P.A for the 60 students at Iowa State was a 3.14 with a standard deviation of 0.32 and the average G.P.A at Indiana State was a 3.31 with a standard deviation of 0.18. Does the data support the students claim?

Std. Error samp diff 0.17 0.047399 (18) P-value = .0002  $\frac{(x_1-x_2)-0}{S_1^2}\approx -3.587$   $\frac{S_1^2}{N_1}+\frac{S_2^2}{N_2}\approx + \text{ Swee our } p\text{-value is}$   $\frac{S_1^2}{N_1}+\frac{S_2^2}{N_2}\approx + \text{ Swee our } p\text{-value is}$ at Iowa St. university is lower than the mean G.P.A at Indiana St. University.

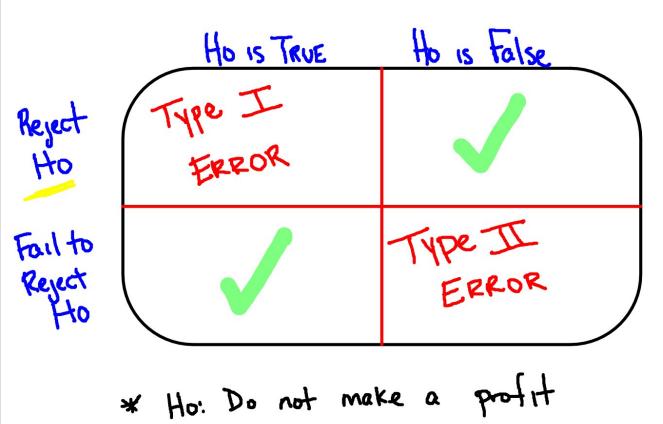
If someone believes the average temperature in a specific state is over 76° and they take a sample of 50 days and record the temperatures for that state. The average temperature for the 50 days is 80°. They conduct an appropriate hypothesis test and discover the p-value is equal to 0.04. Explain in detail what the p-value is actually saying in the context of this problem.

\* There is a 41. chance we would get a sample mean of 80 for 50 days

P-value: . 04

The state is 76.

Ho:  $\mu > 76$ Ha:  $\mu > 76$ 



\* Ha: We will make a profit

- . shows Ho is true (Do not buy a ticket)
- . Reject Ho (Buy Ticket)

(Lose #2) \*Ho: If you buy a ticket you will lose #2

Ha Win Lotto

Type II

Fail to reject the

Don't buy the ticket

but would have won.

\* Type I Reject Ho when True Lose \$ 2