TOPIC: GOODNESS OF FIT USING A TI-84

Goodness of Fit Test Using a TI-84

◆ To run a G.O.F. test on a TI-84, use the **D:χ^2GOF-Test** function.

EXAMPLE

A company surveys 200 customers about their preferred flavor of a new drink: Lemon, Berry, Mango, or Peach. The observed counts are below. Test at the 5% sig. level whether customer preferences are equally distributed among the flavors.

Flavor	Lemon	Berry	Mango	Peach
Obs. Freq.	48	58	42	52

H_0:

H_a:

$n =$ ___ $k =$ ___ $E =$ ___

Because P-value **[< | >]** α, we **[REJECT | FAIL TO REJECT]** H_0. There is **[ENOUGH | NOT ENOUGH]** evidence to conclude that the obs. freq's do not match the claimed distribution, therefore it **[IS | IS NOT]** a good fit for flavor preferences.

HOW TO: G.O.F. Test Using a TI-84

1) STAT, **1:Edit…**
   Enter obs. freq's in **L1**
   exp. values in **L2**

2) STAT, > **TESTS**
   v **D:χ^2GOF-Test**

3) **Observed:L1**
   Expected:L2
   df:
   Calculate **Draw**

Recall

n = total samp. size

k = # of categories

$E = \frac{n}{k}$, $df = k - 1$

PRACTICE

A student performs a Goodness of Fit Test using technology to see if the proportion of each candy flavor in a bag matches the expected distribution. They get the following results: $\chi^2 = 18.99$ & $p = 0.0019$. What can they conclude about the claimed distribution of candy flavors?

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EXAMPLE

A call center manages phone calls for four branches of a major company (A, B, C, & D). The center claims that they receive the same number of calls for each branch. To test the claim, the center randomly samples 160 calls and marks which branch the call is for. Perform a Goodness of Fit test on the data collected below with $\alpha = 0.01$.

Branch	A	B	C	D
Number of Calls	61	32	30	37

H_0: Observed frequencies **[DO | DO NOT]** match claimed distribution.

H_a: Observed frequencies **[DO | DO NOT]** match claimed distribution.

Because P-value **[< | >]** α, we **[REJECT | FAIL TO REJECT]** H_0.
There is **[ENOUGH | NOT ENOUGH]** evidence to suggest H_a is true.
So, the claimed dist. **[IS | IS NOT]** a good fit.

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1) STAT, **1:Edit…**
Enter obs. freq's in **L1**
exp. freq's in **L2**

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3) **Observed:L1**
Expected:L2
df:
Calculate **Draw**

Recall

$E = \frac{n}{k}$ *(claimed prob's SAME)*

$E = np$ *(claimed prob's DIFF)*

EXAMPLE

A store is doing an email coupon giveaway with promotional ads that give the chance of getting each type of coupon. A business bureau wants to investigate whether the ad reports the actual distribution for the coupons, so they sample 1000 emailed coupons and record the number of coupons for each discount amount.

Coupon	$5 off	$10 off	$15 off	$20 off	$50 off
Expected (%)	50%	20%	15%	10%	5%
Actual Count	615	213	72	81	19

$(\boldsymbol{A})$ Perform a Goodness of Fit Test with $\alpha = 0.1$ to test the claim.

H_0: Observed frequencies **[DO | DO NOT]** match claimed distribution.

H_a: Observed frequencies **[DO | DO NOT]** match claimed distribution.

Because P-value **[< | >]** α, we **[REJECT | FAIL TO REJECT]** H_0. There is **[ENOUGH | NOT ENOUGH]** evidence to suggest H_a is true. So the claimed dist. **[IS | IS NOT]** a good fit.

$(\boldsymbol{B})$ If the claimed distribution is not accurate, the store will have to correct their ads. Will they need to correct their ads?

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EXAMPLE

A high school claims that the commuting habits for incoming freshman will match the distribution of last year's class, so they collect data on a random sample of 100 students and their commuting habits to test the claim.

Method	Car	Bus	Walk	Bike	Other
Expected (%)	63%	28%	6%	2%	1%
Actual Count	68	23	5	2	2

$(\boldsymbol{A})$ Perform a Goodness of Fit Test with $\alpha = 0.05$ to test the claim.

H_0: Observed frequencies **[DO | DO NOT]** match claimed distribution.

H_a: Observed frequencies **[DO | DO NOT]** match claimed distribution.

Because P-value **[< | >]** α, we **[REJECT | FAIL TO REJECT]** H_0.
There is **[ENOUGH | NOT ENOUGH]** evidence to suggest H_a is true.
So, the claimed dist. **[IS | IS NOT]** a good fit.

$(\boldsymbol{B})$ Should the school do further research on the commuting habits of the upcoming class, or can they assume commuting habits remain the same for the incoming class?

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$E = \frac{n}{k}$ *(claimed prob's SAME)*

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