Time Frame: 50 minutes

Subject Matter: Test in Standard Error of the Estimate &Chi Square TELL ME

Objective: TSWBAT solve the problems in the test with at least 90% accuracy

Standards: DA – 3.8

 Materials: TI 83 Calculators and Test papers

SHOW ME

Test

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Formula: $S\_{est}=\sqrt{\frac{∑y^{2}-a∑xy-b∑y}{n-2}}$

1. A manager finds that there is a relationship between the number of radio ads aired per week and the amount of sales (in thousands) of a product. Compute the standard error of the estimate.

|  |  |
| --- | --- |
| No. of ads (x) | Sales (y) |
|  2 | 2 |
| 5 | 4 |
| 8 | 7 |
| 8 | 6 |
| 10 | 9 |
| 12 | 10 |

1. A researcher collects the following data and determines that there is a significant relationship between the age of a copy machine and its monthly maintenance cost. Find the standard error of the estimate.

|  |  |  |
| --- | --- | --- |
| Machine | Age (in years)(x) | Monthly cost(y) |
| A | 1 | $62 |
| B | 2 | $78 |
| C | 3 | $70 |
| D | 4 | $90 |
| E | 4 | $93 |
| F | 6 | $103 |

1. USA Today reported that 21% of loans granted by credit unions were for home mortgages, 39% were for automobile purchases, 20% were for credit card and other unsecured loans, 12% for real estate other than home loans, and 8% were for other miscellaneous needs. In order to see if her credit union customers had similar needs, a manger surveyed a random sample of 100 loans and found that 25 were for home mortgages, 44 for automobile purchases, 19 for credit card and unsecured loans, 8 for real estate other than home loans, and 4 for miscellaneous needs. At $α=0.05$, is the distribution the same as reported in the newspaper?

Solution: Make sure to fill-in the blanks.

d.f. = \_\_\_categories minus 1 = \_\_\_

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Frequency | Home mortgages | Automobile purchases | Credit card & other loans | Real estate | Misc. |
| Observed |  |  |  |  |  |
| Expected |  |  |  |  |  |

$\\_\\_\\_\\_\\_×\\_\\_\\_\\_\\_\\_$
$$\\_\\_\\_\\_\\_×\\_\\_\\_\\_\\_\\_$$

$$\\_\\_\\_\\_\\_×\\_\\_\\_\\_\\_\\_$$

$$\\_\\_\\_\\_\\_×\\_\\_\\_\\_\\_\\_$$

$$\\_\\_\\_\\_\\_×\\_\\_\\_\\_\\_\\_$$

The total number of loans is \_\_\_\_\_.

* State the hypotheses:

$H\_{0}:$ USA Today reported the following loans granted by state credit unions:

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

$H\_{1}:$ The distribution is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Find the critical value:

Use table G

* Compute the test value:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Frequency | Home mortgages | Automobile purchases | Credit card & other loans | Real estate | Misc. |
| Observed |  |  |  |  |  |
| Expected |  |  |  |  |  |

$$χ^{2}=∑\frac{\left(O-E\right)^{2}}{E}$$

$χ^{2}=\frac{\left( - \right)^{2}}{ }+\frac{\left( - \right)^{2}}{ }+ \frac{\left( - \right)^{2}}{ }+ \frac{\left( - \right)^{2}}{ }+ \frac{\left( - \right)^{2}}{ } $

$χ^{2}=\frac{\left( \right)^{2}}{ }+\frac{\left( \right)^{2}}{ }+ \frac{\left( \right)^{2}}{ }+ \frac{\left( \right)^{2}}{ }+ \frac{\left( \right)^{2}}{ } $

$χ^{2}=\\_\\_\\_\\_\\_\\_+\\_\\_\\_\\_\\_\\_ +\\_\\_\\_\\_\\_\\_ +\\_\\_\\_\\_\\_\\_+\\_\\_\\_\\_\\_\\_$

Compare this to the critical value

$$χ^{2}=\\_\\_\\_\\_\\_$$

* Make the decision:

Accept \_\_\_\_\_\_\_\_\_ since the computed value is \_\_\_\_\_\_\_\_\_\_\_\_\_ than the critical value.

* Summarize the result:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_