



## Chi-Square Test - Goodness of Fit.

The test of significance of experimental values and theoretical values under some theory of hypothesis is called as chi square test ( $\chi^2$ )

Test Statistics.

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

O - Observed frequency

E = Expected frequency =

$$\frac{\text{Total}}{\text{no of terms}}$$

Dof :  $n - 1$



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1) The number of automobile accidents per week in a certain community are as follows: 12, 8, 20, 2, 14, 10, 15, 6, 9, 4. Are these frequencies in agreement with the belief that accident conditions were the same during this 10 week period.

$$E = \frac{100}{10} = 10$$

$H_0$ : Accident conditions were the same during 10 weeks

$H_1$ : Accident conditions were not the same.



$O$	$E$	$O-E$	$(O-E)^2/E$
0	10	2	0.4
12	10	-2	0.4
8	10	10	10
20	10	-8	6.4
2	10	4	1.6
14	10	0	0.0
10	10	5	2.5
15	10	-4	1.6
6	10	-1	0.1
9	10	-6	3.6
4	10		<u>26.6</u>



$$df : n-1 = 10-9 = 9$$

$$LOS : 5\%$$

Test Statistic

$$\chi^2 = \frac{(O-E)^2}{E} = \frac{26.6}{10} = 26.6$$

Critical value:  $\alpha = 5\%$   $\nu = 9$ .

$$\chi^2_{\alpha} = 16.9$$

Conclusion: C.V  $\chi^2_{\alpha}$  T.V

$$26.6 > 16.9$$

$H_0$  rejected.