Part 4

Chi-Squared Goodness-of-Fit Test –

- Multinomial Experiment
  - Consists of a fixed number of *n* trials
  - The outcome of each trial can be classified into one of *k* categories, called *cells*
  - The probability *p* that the outcome will fall into cell *I* remains constant for each trial
  - Each trial of the experiment is independent of other trials
- Hypotheses:
  - H_0: $p_1 = \#$, $p_2 = \#$, $p_3 = \#$ etc.
  - H_A: At least one p_i is not equal to its specified value
- Expected value: $e_i = np_i$
- $X^2 = \sum (f_i - e_i)^2 / e_i$

Make a table:

Category	Observed frequency	Expected frequency	(f – e)	$(f - e)^2 / e$
A				
B				
Total				$X^2 = \#$

Rejection Region: $X^2 > X^2_{\alpha, k-1}$

- Describes a single population
- Nominal data
- 2 or more categories

Chi-Squared Test of a Contingency Table –

EXAMPLE:

P(Accounting) = 61/152 = .401
P(Finance) = 44/152 = .289
P(Marketing) = 47/152 = .309

P(BA) = 60/152 = .395
P(BEng) = 31/152 = .204
P(BBA) = 39/152 = .257
P(Other) = 22/152 = .145

Undergrad Degree	Accouting	Finance	Marketing	Total
B.A.	152 x 60/152 x 61/152 = 24.08	152 x 60/152 x 44/152 = 17.37	152 x 60/152 x 47/152 = 18.55	60
B.Eng.	152 x 31/152 x 61/152 = 12.44			31
B.B.A				39
Other				22
Total				152

Expected Frequencies = Row total x column total / sample size
$X^2 = (31 - 24.08)^2/24.08 + \ldots$

Rejection Region: $X^2 > X^2_{\alpha, v}$ $v = (r-1)(c-1)$

- Analyzes relationship between two variables and compares two or more opulations
- Nominal data