INSTRUCTIONS:

A **chi-square test of independence** requires an *r* × *c* **contingency table** that has *r* rows and *c* columns. Degrees of freedom for the chi-square test will be (*r* − 1)(*c* − 1). In this test, the **observed frequencies** are compared with the **expected frequencies** under the hypothesis of independence. The test assumes

categorical data (attribute data) but can also be used with numerical data grouped into classes. **Cochran’s Rule** requires that expected frequencies be at least 5 in each cell, although this rule is often relaxed. A test for **goodness-of-fit (GOF)** uses the chi-square statistic to decide whether a sample is from a specified distribution (e.g., multinomial, uniform, Poisson, normal). The **parameters** of the fitted distribution (e.g., the mean) may be specified *a priori,* but more often are estimated from the sample. Degrees of freedom for the GOF test are *c* − *m* − 1 where *c* is the number of categories and *m* is the number of parameters estimated. The **Kolmogorov-Smirnov** and **Lilliefors** tests are **ECDF-based tests** that look at differences between the sample’s empirical cumulative distribution function (ECDF) and the hypothesized distribution. They are best used with *n* individual observations. The **Anderson-Darling** test and the **probability plot** are the most common ECDF tests, most often used to test for normality

***15.22***: A student team examined parked cars in four different suburban shopping malls. One hundred vehicles were examined in each location. Research question: At α = .05, does vehicle type vary by mall location? (Data are from a project by MBA students Steve Bennett, Alicia Morais, Steve Olson, and Greg Corda.)

Vehicle Type Somerset Oakland Great Lakes Jamestown Row Total

Car 44 49 36 64 193

Minivan 2 15 18 13 67

Full-sized Van 2 3 3 2 10

SUV 19 27 26 12 84

Truck 14 6 17 9 46

Col Total 100 100 100 100 400