VII. Samples of 10 taken in 1985 and 1995 revealed the average time people spend grocery shopping decreased from 18 minutes to 14 minutes. Respective standard deviations were 5 minutes and 4 minutes. Test at the .10 level of significance whether there has been a change in shopping time variability.

Given:
n_1 and n_2 = 10
$\bar{x}_1 =$ 18 minutes
$\bar{x}_2 =$ 14 minutes
$S_1 =$ 5 minutes
$S_2 =$ 4 minutes
.10 level of significance

1. $H_0 : \sigma_1^2 = \sigma_2^2$ and $H_1 : \sigma_1^2 \neq \sigma_2^2$
2. The level of significance is .10.
3. F is the test statistic.
   $df = n_1 - 1 = 10 - 1 = 9$
   $df = n_2 - 1 = 10 - 1 = 9$
   $\alpha \div 2 = .10 \div 2 = .05 \rightarrow F = 3.18$
4. If F for the test statistic is beyond the critical value of F, reject H_0.
5. $F = \frac{s_1^2}{s_2^2}$

   $= \frac{5^2}{4^2}$

   $= 1.56$

   Accept H_o because 1.56 < 3.18.
   Shopping time is not more variable.

VIII. Test at the .05 level of significance whether workplace accidents happen equally throughout the workweek.

Day	Accidents f_o	f_e	$f_o - f_e$	$(f_o - f_e)^2$	$(f_o - f_e)^2/f_e$
Monday	9	7	2	4	4/7 = 0.571
Tuesday	5	7	-2	4	4/7 = 0.571
Wednesday	6	7	-1	1	1/7 = 0.143
Thursday	5	7	-2	4	4/7 = 0.571
Friday	10	7	3	9	9/7 = 1.286
Totals	35	35	0		3.142

H_0 : accidents are equally distributed

H_1 : accidents are not equally distributed

$df = k - 1 = 5 - 1 = 4$

$\alpha = .05 \rightarrow \chi^2 = 9.49$

$$\chi^2 = \Sigma\left[\frac{(f_o - f_e)^2}{f_e}\right] = 3.142$$

Accept H_o because 3.14 < 9.49.
Accidents happen equally throughout the workweek.