

QERM 598 - HW 6
 Due February 28, 2007
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Contingency tables and chi-squared tests

1 Fish scarring

A study was performed analyzing the scarring experienced by adult salmon on their spawning migration in Alaska. The researchers are interested in knowing whether dense fishing activities in Briston Bay are impacting the fish. The data is counts of scarred and unscarred fish collected at three different periods.:

	Period 1	Period 2	Period 3
Scarring YES	14	156	126
Scarring NO	322	188	229

- a. Using the notation from the notes, identify r and c and calculate R_i , C_i and N .
- b. State a null-hypothesis that explores the effect of time period on fish-scarring.
- c. Generate a table of expected frequencies under to the null hypothesis.
- d. Obtain a test statistic to test the null hypothesis. What is it's distribution?
- e. Perform a test of the null-hypothesis based on this statistic.
- f. What are your conclusions?

2 Tea Party

David Salsburg wrote an engaging popular history of statistics called “The Lady Tasting Tea: How Statistics Revolutionized Science in the Twentieth Century” (W.H. Freeman & Co., 340 pp). The title refers to a Cambridge University tea party in the early 1900's. One of the guests insisted that tea tastes different depending on whether the tea was poured into the milk or whether the milk was poured into the tea. Most of the people attending the party thought this was nonsense, but R.A. Fisher, who was also in attendance, immediately devised a simple experiment to test the lady's assertion.

Can you devise an experiment that is capable of ruling out the role of random luck? How would you perform the test? Be sure to specify the null hypothesis you are testing.