

Brief.

Surprise Quiz  
CSE383M and CS395T  
April 9, 2014

1. In a survey, 16 students in Austin and 24 students in Ann Arbor are asked whether they prefer to eat chicken, fish, or tofu. In all, 20 prefer chicken, 15 fish, and 5 tofu. Fill in all the squares in the contingency table below, either with known values, or else with expectation values under the null hypothesis that there is no association between location and dietary preference.

|         | Austin | Ann Arbor |    |
|---------|--------|-----------|----|
| Chicken | 8      | 12        | 20 |
| Fish    | 6      | 9         | 15 |
| Tofu    | 2      | 3         | 5  |
|         | 16     | 24        | 40 |

2. In an intramural tournament with 24 players total, CSEM fields a team of 10, while CS fields a team of 8. The results are that out of 5 players in the winner's circle, 2 are from CSEM and 2 are from CS. What is the probability of getting this exact result if in fact all players have equal ability?

$$\begin{aligned}
 P &= \frac{\binom{10}{2} \binom{8}{2} \binom{6}{1}}{\binom{24}{5}} = \frac{5}{\frac{10 \cdot 9}{2 \cdot 1}} \left( \frac{8 \cdot 7}{2 \cdot 1} \right) \left( \frac{6}{1} \right) \left( \frac{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}{24 \cdot 23 \cdot 22 \cdot 21 \cdot 20} \right) \\
 &= \frac{5 \cdot 9}{11 \cdot 23} = \frac{45}{253} \approx \frac{45}{250} = 0.180 \text{ approx.}
 \end{aligned}$$