

Worksheet 1: Solutions

GPCO 453, FALL 2017

SECTION 01 (SHANE)

NAME:

Problem 1 (Central tendency). The County of San Diego has conducted a food facility inspection search of 300 restaurants. Each restaurant received a rating on a 3-point scale on typical meal price (in columns) and quality (in rows).

Table 1: Food Facility Inspection Results

	1	2	3	Total
1	42	39	3	84
2	33	63	54	150
3	3	15	48	66
Total	78	117	105	300

- a.) Develop a bivariate probability distribution for quality (x) and meal price (y) of a randomly selected restaurant in San Diego.

Table 2: Probability: Food Facility Inspection Results

	1	2	3	Total
1	.14	.13	.01	.28
2	.11	.21	.18	.50
3	.01	.05	.16	.22
Total	.26	.39	.35	1.0

- b.) Compute the expected value for quality rating, x .

$$\begin{aligned}\mathbb{E}[x] &= 1 \times \Pr(x = 1) + 2 \times \Pr(x = 2) + 3 \times \Pr(x = 3) \\ &= 1(.28) + 2(.50) + 3(.22) = 1.94\end{aligned}$$

Problem 2 (Variability). Compute covariance and correlation coefficient:

x_i	6	12	13	15
y_i	5	6	8	1

- $\bar{x} = 11.5, \bar{y} = 5$
- $\sigma_x^2 = \frac{\sum(x_i - \bar{x})^2}{n-1} = 15$
- $\sigma_y^2 \approx 8.67$
- $\sigma_{xy} = \frac{0 + .5 + 4.5 - 14}{4-1} = \boxed{-3}$
- $\rho_{xy} = \frac{-3}{\sqrt{15}\sqrt{8.67}} \approx \boxed{-.26}$