Midterm Solution

May 1, 2012

Question 1

$Min.$	$1stQu.$	$Median$	$3rdQu.$	$Max.$	$Range$	IQR
1	2	3	4	8	7	2

Question 2

Observational Study
Response variable: smoking status
Explanatory variable: gender
P_f = proportion of smokers among female = 30/120 = 0.25

Table 1: Contingency table - Question 2

	Smoke	No Smoke	Total
Female	30	90	120
Male	30	70	100
Total	60	160	220

P_m = proportion of smokers among male = 30/100 = 0.3
O_f = odd of smoking among female = 0.25/0.75 = 1/3
O_m = odd of smoking among male = (0.3)/(0.7) = 3/7
$OR = O_m/O_f = 9/7 = 1.29$
The odds of smoking among males are 1.29 times higher than that among

females

Question 3

$$\bar{x} = 10, CV_x = 0.5 \Rightarrow S_x = (10)(0.5) = 5$$
$$y = 2x + 5 \Rightarrow \bar{y} = 2\bar{x} + 5 = 25, S_y = 2S_x = 10$$
$$CV_y = \frac{S_y}{\bar{y}} = 0.4$$

Question 4

$P(E_1 \cup E_2) = P(E_1) + P(E_2) = 0.9 \neq 1 \Rightarrow E_1$ and E_2 don't partition the sample space

Question 5

$$P(E_1 \cap E_2) = P(E_1) + P(E_2) - P(E_1 \cup E_2) = 0.1$$
$$P((E_1 \cap E_2)^c) = 1 - P(E_1 \cap E_2) = 1 - 0.1 = 0.9$$