

Math 4753-12

Exam 1

Luis Mario Tremisi

R  $\{$  table(MTBE\$WellClass, MTBE\$Aguifier)

	Bedrock	unconsoli	
Private	103	0	103
Public	98	22	120
	201	22	223

1)  $P(\text{Bedrock} | \text{Public}) = 98/120 = 0.8167$

2)  $P(\text{Public}) = 120/223 = 0.538$

R  $\{$  table(MTBE\$WellClass, MTBE\$MTBE.Detect)

	Below	Detect	
Private	81	22	103
Public	72	48	120
	153	70	223

3)  $P(\text{Private} \cap \text{Below}) = 81/223 = 0.3632$

4)	Positive	Negative
yes	0.91	
NO		0.82

$P(+|U) = 0.91$

$P(-|NU) = 0.82$

$P(U) = 0.05$

$P(+|NU) = 1 - P(-|NU) = 0.18$

$P(NU) = 1 - P(U) = 0.95$

$$P(U|+) = \frac{P(+|U) \cdot P(U)}{P(+|U)P(U) + P(+|NU)P(NU)} = \frac{0.91 \cdot 0.05}{0.91 \cdot 0.05 + 0.18 \cdot 0.95}$$

$P(U|+) = 0.2102$



5) 30

EPAGAS = read.csv("EPAGAS.csv")

MPG = EPAGAS\$MPG

$Z = (MPG - \text{mean}(MPG)) / \text{sd}(MPG)$

$MPG[\text{abs}(Z) > 2 \ \& \ \text{abs}(Z) \leq 3]$

6) 0.49

EPAGAS = read.csv("EPAGAS.csv")

MPG = EPAGAS\$MPG

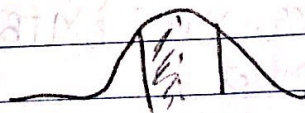
$Z = (MPG - \text{mean}(MPG)) / \text{sd}(MPG)$

$P = \text{length}(MPG[\text{abs}(Z) \leq 3]) / \text{length}(Z)$

7)  $\text{mean}(EPAGAS\$MPG) + \text{sd}(EPAGAS\$MPG)$

39.419

$U = \mu + \text{sd}$



8)  $\int_0^2 C y^2 dy = 1$

$$\frac{C y^3}{3} \Big|_0^2 = 1 \Rightarrow \frac{C \cdot 2^3}{3} = 1$$

$$C = 3/2^3 = 0.375$$

9) a b/c continuous

10)  $\int_0^2 3/4 y^2 dy + \int_0^1 3/4 y^2 dy + \int_2^3 3/4 y^2 dy$

= 1

$$\begin{cases} 3/4 y^2 & \text{for } 0 \leq y \leq 2 \\ 0 & \text{for others} \end{cases}$$

So, it is one because y covers all the data for which  $f(y) = 3/4 y^2$

$$11) P_{\text{norm}}(13, 12, 4) - P_{\text{norm}}(8, 12, 4) = 0.4401$$

$$12) P = 0.4567 \quad q = 1 - P = 0.5433$$

$$\Rightarrow \sigma_x^2 = p \cdot q = \mu_2' - \mu_1'^2$$

$$\Rightarrow \mu_2' - \mu_1'^2 = 0.4567 \cdot 0.5433 = 0.2481$$