Solutions, Assignment 4, Stat 1510

Question 1) See the solution manual Ex. 14.16.

Question 2) " " " " Ex. 14.18.

Question 3) " " " " Ex. 14.22.

Question 4) " " " " Ex. 14.32.

Question 5) " " " " Ex. 15.10.

Question 6) " " " " Ex. 15.18.

Question 7) " " " " Ex. 15.28.

Question 8) " " " " Ex. 18.14.

Question 9) " " " " Ex. 18.20.

Question 10) " " " " Ex. 18.24.

Question 11) The correlation is exactly 1. Since there is an perfect positive correlation between the number of plates purchased by a customer and the amount paid.

Question 12) (a) The IQ is the explanatory variable and GPA is the response variable.

b) The correlation is $r = 0.88$

(Note those who use Rmarkdown, calculating this by cor command is enough But if they solved manually, they should show their work)

c) The least square line is given by:

$$\hat{y} = -7.329 + 2.157x$$

(Similar to Note in part b)

d) Intercept: The intercept means the distance of regression line from the origin (or when $X=0$). Since $IQ=0$ and consequently $GPA=-7.32$ is NOT possible, the intercept is meaningless practically here.

Slope: The slope means the GPA score grows 2.157 when IQ increases one unit.

e) $\hat{y} = -7.329 + 2.157(5.3) = 4.1031$

f) They should scatterplot with regression line (take easy this part as long as they have both graphs. That's fine!)

Question 13) In order to have a legitimate probability model

$$\sum_{i=1}^{6} p_i = 1$$

$$0.2 + 2K + 6K + 0.2 + 0.1 + 0.1 = 1$$

$$\Rightarrow \quad 8K + 0.6 = 1 \quad \Rightarrow \quad 8K = 1 - 0.6 = 0.4$$

$$\Rightarrow K = 4/10 \cdot 8 = \frac{4}{80} = 0.05$$