Q1(a) There is a definite association between budget and sales as $p < 0.001$ and $F_{calc} = 79.52$

(b) The Q-Q plot appears to follow a straight line indicating the assumption of normality is satisfied.

There is no obvious pattern in the Residuals v Fitted values. I can make the assumption that the error terms are independently distributed. and a constant variance is satisfied.

(c) Observation 50 has high Leverage

(d) $\beta_1 = 0.043755$

(e) $y_i = \beta_0 + \beta_1 x_i + e_i$

$\hat{y} = 4.445364 + 0.043755(500)$

$\hat{y} = 26.323$

estimated mean monthly sales when YouTube budget is $500
$= \$2,632$

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Q2

(a) $\beta_1 = 1.00173$

(b) $\hat{y} = -0.35249 + 1.00173x + 23.70402 x z_1$

$- 66.81662 x z_2 - 0.35345 z_1 + 0.01986 x$

(c) $\hat{y} = -0.35249 + 1.00173x + 23.70402(1)$

$- 66.81662(1) - 0.35345(0) + 0.01986(1)$

(d)

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(a) Figure 6 shows that customers' paying by DD ~~will not~~ have a high probability of not defaulting. P-value is less than 0.05 and negative z value with a negative estimated standard error indicate no default

(b)
$$\ln\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 + x_3$$

(c)

$$\ln\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 + x_3$$

$$\ln\left(\frac{P}{1-P}\right) = -2.9292$$