ETC2410 Assignment 2

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Question 2 (31 Marks)

2(a)

$$\begin{aligned}\widehat{HOUSTNSA} = & \underset{(4.196)}{92.871} - \underset{(5.911)}{4.592}\ Jan - \underset{(5.911)}{1.935}\ Feb + \underset{(5.934)}{26.184}\ Mar \\ & + \underset{(5.934)}{41.452}\ Apr + \underset{(5.934)}{46.786}\ May + \underset{(5.934)}{46.263}\ Jun + \underset{(5.934)}{40.937}\ Jul \\ & + \underset{(5.934)}{38.714}\ Aug + \underset{(5.934)}{32.252}\ Sep + \underset{(5.934)}{36.170}\ Oct + \underset{(5.934)}{15.600}\ Nov\end{aligned} \tag{1}$$

2(b)

Steps

In order to formulate the linear regression, first we need to determine the intercept: From equation 1 we can determine the values of each month because of the dummy variables. $92.871 - 4.592 = c \rightarrow c = 88.280$, where the LHS is the month of Jan from calculated from equation 1.

Next we need to determine the β values for Feb - Dec. Since we know the intercept for the

new equation, we can substitute it in.

$$92.871 + 1.935 = 88.280 + \beta_2\ Feb$$
$$\rightarrow\ \beta_2 = 2.656$$

$$92.871 + 26.184 = 88.280 + \beta_3\ Mar$$
$$\rightarrow\ \beta_3 = 30.776$$

$$92.871 + 41.452 = 88.280 + \beta_4\ Apr$$
$$\rightarrow\ \beta_4 = 46.044$$

$$92.871 + 46.786 = 88.280 + \beta_5\ May$$
$$\rightarrow\ \beta_5 = 51.377$$

$$92.871 + 46.263 = 88.280 + \beta_6\ Jun$$
$$\rightarrow\ \beta_6 = 50.855$$

$$92.871 + 40.937 = 88.280 + \beta_7\ Jul$$
$$\rightarrow\ \beta_7 = 45.528$$

$$92.871 + 38.714 = 88.280 + \beta_8\ Aug$$
$$\rightarrow\ \beta_8 = 43.306$$

$$92.871 + 32.252 = 88.280 + \beta_9\ Sep$$
$$\rightarrow\ \beta_9 = 36.844$$

$$92.871 + 36.170 = 88.280 + \beta_10\ Oct$$
$$\rightarrow\ \beta_{10} = 40.762$$

$$92.871 + 15.600 = 88.280 + \beta_11\ Nov$$
$$\rightarrow\ \beta_{11} = 20.192$$

$$92.871 = 88.280 + \beta_12\ Dec$$
$$\rightarrow\ \beta_{12} = 4.592$$

$$\begin{aligned}\widehat{HOUSTNSA} = 88.280 \ &+ \ 2.656 \ Feb \ + \ 30.776 \ Mar \ + \ 46.044 \ Apr \\ &+ \ 51.377 \ May \ + \ 50.855 \ Jun \ + \ 45.528 \ Jul \ + \ 43.306 \ Aug \\ &+ \ 36.844 \ Sep \ + \ 40.762 \ Oct \ + \ 20.192 \ Nov \ + \ 4.592 \ Dec\end{aligned} \tag{2}$$

2(c)

2(d)

2(e)