FOOD DEMAND ANALYSIS WITH SPSS

DETERMINING HOW WELL THE MODEL FITS

REGRESSION

The first table of interest is the Model Summary table. This table provides the *R*, R^2, adjusted R^2, and the standard error of the estimate, which can be used to determine how well a regression model fits the data:

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.954[a]	.910	.910	47.51923
a. Predictors: (Constant), num_orders, meal_id, center_id, week, checkout_price				

The "R" column represents the value of *R*, the multiple correlation coefficient. *R* can be considered to be one measure of the quality of the prediction of the dependent variable; in this case. A value base_price of 0.954, indicates a good level of prediction. The "R Square" column represents the R^2 value which is the proportion of variance in the dependent variable that can be explained by the independent variables. We can see from our value of 0.910 that our independent variables explain 91% of the variability of our dependent variable, base_price.

STATISTICAL SIGNIFICANCE

The F-ratio in the ANOVA table tests whether the overall regression model is a good fit for the data. The table shows that the independent variables statistically significantly predict the

dependent variable, F (5, 1993) = 4054.172, p < .0005 (i.e., the regression model is a good fit of the data).

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	45773167.619	5	9154633.524	4054.172	.000[b]
	Residual	4500347.657	1993	2258.077		
	Total	50273515.276	1998			
a. Dependent Variable: base_price						
b. Predictors: (Constant), num_orders, meal_id, center_id, week, checkout_price						

ESTIMATED MODEL COEFFICIENTS

The general form of the equation to predict base_price from week, center_id, meal_id, checkout_price, num_orders are:

If $p < .05$, we can conclude that the coefficients are statistically significantly different to 0 (zero). The *t*-value and corresponding *p*-value are located in the "t" and "Sig." columns, respectively, as highlighted below:

This is obtained from the Coefficients table, as shown below:

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	11.254	5.397		2.085	.037
	week	-.015	.026	-.004	-.578	.563
	center_id	.032	.023	.009	1.368	.172

	meal_id	-.001	.002	-.004	-.587	.557
	checkout_price	1.015	.007	.965	139.886	.000
	num_orders	.021	.003	.054	7.868	.000
a. Dependent Variable: base_price						

We can see from the "Sig." column that all independent variable coefficients are statistically significantly different from 0 (zero). Unstandardized coefficients indicate how much the dependent variable varies with an independent variable when all other independent variables are held constant.

CONCLUSION

A multiple regression was run to base_price from week, center_id, meal_id, checkout_price, num_orders. These variables statistically significantly predicted base_price, F (5, 1993) = 4054.172, $p < .0005$, $R^2 = 0.910$. All five variables added statistically significantly to the prediction, $p < .05$.