

BUS 735: Business Decision Making and Research
In-class Exercise: Logistic Regression

Name: _____

Learning Objectives:

- LO2: Be able to construct and use multiple regression models (including some limited dependent variable models) to construct and test hypotheses considering complex relationships among multiple variables.
- LO6: Be able to use standard computer packages such as SPSS and Excel to conduct the quantitative analyses described in the learning objectives above.
- LO7: Have a sound familiarity of various statistical and quantitative methods in order to be able to approach a business decision problem and be able to select appropriate methods to answer the question.

Directions: Work in groups of up to four people and answer the following questions. All papers will be collected, but only one member's paper will be randomly selected and graded and all members of the group will receive the same grade.

By signing below, you agree that the following work represents the efforts of everyone in the group, and you are willing to accept as your own grade for the group project the grade earned from this representation of your group's work. Every member must agree to these terms to earn a non-zero grade for this assignment.

_____ Signature Group Member 1	_____ Print Name	_____ Date
_____ Signature Group Member 2	_____ Print Name	_____ Date
_____ Signature Group Member 3	_____ Print Name	_____ Date
_____ Signature Group Member 4	_____ Print Name	_____ Date

Directions: When asked “Test the hypothesis..” or “Is there evidence of..” or “Is there statistical significance of..” conduct the appropriate hypothesis test, following these steps (in order):

- Indicate what statistical test / statistical method you are using.
- State the null and alternative hypothesis.
- Report the p-value.
- Conclude whether you reject or fail to reject the null hypothesis.
- State your result in plain English.

1. Test the hypothesis that there is a relationship between weight and gender.

2. Test the hypothesis that there is a relationship between weight and age.

3. Test the hypothesis that there is a relationship between weight and race.

4. Test the hypothesis that there is a relationship between weight and depression.

5. Test the hypothesis that there is a relationship between weight and marital status.

6. Test the hypothesis that there is a relationship between weight and financial status.

7. Recode the following variables so that they become dummy variables, appropriate for regression analysis

- Create a new variable called RACE_WHITE that is equal to 1 if white, 0 otherwise.
- Create a new variable called SINGLE that is equal to 1 if marital status is equal to 'Single', 0 otherwise.
- Create a new variable called POOR that is equal to 1 if financial status is equal to 'Overextended', 0 otherwise.
- Create a new variable called DEPRESSED that is equal to 1 if score for Depression is greater than 15.

8. Run a logistic regression with OVERWEIGHT as the dependent variable, with the following explanatory variables: GENDER, AGE, RACE_WHITE, SINGLE, POOR, and DEPRESSED.

(a) For which variables is there significant evidence that it leads to an increased chance of being overweight? Test appropriate hypotheses.

(b) Of the individuals who are overweight in your sample, what percentage of them does the model correctly predict they will be overweight?

(c) Of the individuals who are not overweight in your sample, what percentage of them does the model correctly predict they will not be overweight?

(d) What is the probability that the following person will be overweight? He is a male student, age 21, who is single, white, feels comfortable financially, and is not depressed.

(e) For a person typical of the previous student, what impact does being overextended financially have on the probability of being overweight?

(f) For a person typical of student in problem (d), what impact does being female have on the probability of being overweight?