You should also be able to develop and interpret hypotheses similar to those problem 4 group assignment 2

3.(10 points) Please use the file “Flight delays ledolter with dummies.csv” to answer this question.

These data are same as the data used earlier in the class. The flights have origins in BWI, DCA or IAD, and destinations in EWR, JFK, or LGA. The variable delaynew is 1 if the flight is delayed, and 0 if not delayed.

d1 = 1 if origin is BWI, d1=0 if origin is DCA or IAD

d2 = 1 if origin is DCA, d2=0 if origin is BWI or IAD

d3 = 1 if destination is EWR, d3=0 if destination is JFK or LGA

d4 = 1 if destination is JFK, d4=0 if destination is EWR or LGA

d5 = 1 if the flight is in the evening (6:00 pm or later), d5 = 0 if not

Estimate a logit model with delaynew as the response variable, and d1, d2, d3, d4 and d5 as independent variables, that is,

I = B0 + B1\*d1 + B2\*d2 + B3\*d3 + B4\*d4 + B5\*d5

Then, use Models 🡺 Hypothesis tests 🡺 Linear hypothesis to test each of the following five hypotheses at a 95% level of confidence:

1. **B1 = B2 = 0**

The probability of whether a flight is delayed or not has nothing do to with a flight’s origin.

1. **B3 = B4 = 0**

The probability of whether a flight is delayed or not has nothing do to with a flight’s destination.

1. B1 = B4 = 0

B1=0. Given time of departure and destination, flights from IAD and BWI origins are equally likely to be delayed.

B4=0. Given time of departure and origins, flights to LGA and JFK destinations are equally likely to be delayed. Combined: Given time of departure, for flights from either IAD or BWI (origin) and to either LGA or JFK (destination), they are equally likely to be delayed

1. **B2 + B3 = 0**

Given time of departure, flights are equally likely to be delayed for the following two combinations of origin and destination: 1) origin=IAD and destination=LGA; 2) origin=DCA and destination=EWR

1. B0 + B3 + B5 = 0

A flight has a 50% likelihood to be delayed if the flight departures from IAD to EWR in the evening (6:00pm or later).

For each hypothesis, state the meaning of the hypothesis and the result (that is, whether you can reject the null hypothesis at a 95% level of confidence).

**When to reject:**

**For testing of logit regressions hypotheses**

1. P-value greater than 0.05, failed to reject the null hypothesis.
2. Chi-squrare>Chisquare0.01->reject null hypothesis

**Standard regression model:**

If F>Falpha(k,n-m-1), reject null hypothesis