



Quiz Feedback: Fitting the Model

Your Score: 100% Congratulations! Your score of 100% indicates that you've mastered the topics in this lesson. If you'd like, you can review the feedback.

When you're finished, exit the lesson.



1. Which of the following statements is true regarding logistic regression?

- ☐ a. The logit transformation takes the log of the posterior probability.
- ☐ b. The logit transformation transforms the probability scale to the real line $(-\infty, +\infty)$.
- ☐ c. The parameter estimates measure the rate of change in the probability corresponding to a one-unit change in the input variable, adjusted for the effects of the other inputs.
- ☐ d. The standard logistic regression model assumes that the posterior probability is a linear combination of the input variables.

Your answer: b

Correct answer: b

The logit transformation takes the log of the odds. The parameter estimates measure the rate of change in the logit. Answer *d* is incorrect because the standard logistic regression model assumes that the logit of the posterior probability is a linear combination of the input variables.



2. Which of the following statements is true regarding odds ratios?

- ☐ a. An odds ratio of 1.20 means that there is a 20% increase in the logit for every one-unit increase in the predictor variable.
- ☐ b. An odds ratio compares the probability of the event in one group to the probability of the event in another group.
- ☐ c. The scale of the odds ratios goes from $-\infty$ to $+\infty$.
- ☐ d. Exponentiating the parameter estimates gives the odds ratio.

Your answer: d

Correct answer: d

The odds ratio compares the odds of the event in one group to the odds of the event in another group. The scale of the odds ratios goes from 0 to $+\infty$. An odds ratio of 1.20 means that there is a 20% increase in the odds of the event for every one-unit increase in the predictor variable.



3. Which of the following models has the highest predictive accuracy based on the association of predicted probabilities and observed responses?

- ☐ a. percent concordant = 75.0, percent discordant = 22.0, percent tied = 3.0
- ☐ b. percent concordant = 45.0, percent discordant = 50.0, percent tied = 5.0

- ☐ c. percent concordant = 55.0, percent discordant = 25.0, percent tied = 20.0
- ☐ d. percent concordant = 65.0, percent discordant = 25.0, percent tied = 10.0

Your answer: a

Correct answer: a

Model a has the highest percentage of concordant pairs and the highest c statistic (that is, the percent concordant plus half the percent tied).



4. Which of the following statements is true regarding adjustments for oversampling?

- ☐ a. In logistic regression, all the parameter estimates are affected when you adjust the model for oversampling.
- ☐ b. The priors, π_0 and π_1 , represent the population proportions of class 0 and 1 respectively.
- ☐ c. Oversampling rare events always yields models with higher predictive accuracy.
- ☐ d. When rare events are oversampled, only the slope terms need to be modified.

Your answer: b

Correct answer: b

When you adjust the model for oversampling by using the offset, only the intercept term is affected. There is also no guarantee that oversampling yields models with higher predictive accuracy. When rare events are oversampled, only the intercept term needs to be modified.



5. If the value of the offset is 3.2567, then the model corrected for oversampling has which of the following?

- ☐ a. an intercept that is 3.2567 lower in value compared to the model fitted to the biased sample
- ☐ b. probabilities that are 3.2567% higher than the probabilities from the model fitted to the biased sample
- ☐ c. probabilities that are 3.2567% lower than the probabilities from the model fitted to the biased sample
- ☐ d. parameter estimates that are 3.2567% lower than the parameter estimates from the model fitted to the biased sample

Your answer: a

Correct answer: a

The value of the offset is used to adjust the intercept term.



6. Which statement is true regarding the LOGISTIC procedure statements?

- ☐ a. In the MODEL statement, the response variable must be a binary variable.
- ☐ b. The order of PROC LOGISTIC statements is not important.
- ☐ c. The UNITS statement enables you to obtain an odds ratio estimate for a specified change in a predictor variable.
- ☐ d. More than one MODEL statement is allowed in a single PROC LOGISTIC step.

Your answer: c

Correct answer: c

The response variable in the MODEL statement can be binary, ordinal, or nominal with more than two levels. In PROC LOGISTIC, the CLASS statement must come before the MODEL statement. Only one MODEL statement is allowed in a single PROC LOGISTIC step.

Before answering questions 7-10, perform the following steps in your SAS software.

Note: Make sure you set up the course files before you continue.

a. Copy and paste the following code into the editor:

```
data work.pva(drop=CONTROL_NUMBER MONTHS_SINCE_LAST_PROM_RESP
              FILE_AVG_GIFT FILE_CARD_GIFT);
  set pmlr.pva_raw_data;
run;

data work.pva;
  set work.pva;
  STATUS_FL=RECENCY_STATUS_96NK in("F","L");
  STATUS_ES=RECENCY_STATUS_96NK in("E","S");
run;

proc logistic data=work.pva plots(only)=(effect(clband
          x=(lifetime_card_prom recent_response_prop
            months_since_last_gift
            recent_avg_gift_amt status_es))
          oddsratio (type=horizontalstat))
          namelen=25;
  model target_b(event='1')= lifetime_card_prom
    recent_response_prop months_since_last_gift
    recent_avg_gift_amt status_es / clodds=pl stb;
  units lifetime_card_prom=10 months_since_last_gift=6
    recent_avg_gift_amt=25 / default=1;
run;
```

b. Submit the code and review the results.



7. What is the rank order of the relative importance of the predictor variables?

- ☐ a. Recent_Response_Prop, Months_Since_Last_Gift, Lifetime_Card_Prom, Recent_Avg_Gift_Amt, Status_ES
- ☐ b. Recent_Response_Prop, Lifetime_Card_Prom, Months_Since_Last_Gift, Recent_Avg_Gift_Amt, Status_ES
- ☐ c. Recent_Response_Prop, Lifetime_Card_Prom, Status_ES, Months_Since_Last_Gift, Recent_Avg_Gift_Amt
- ☐ d. Months_Since_Last_Gift, Recent_Avg_Gift_Amt, Recent_Response_Prop, Lifetime_Card_Prom, Status_ES

Your answer: **a**

Correct answer: **a**

The variables are rank ordered by the absolute values of the standardized estimates.



8. The odds ratio for **Recent_Response_Prop** indicates that a one-unit increase in **Recent_Response_Prop** yields which of the following?

- ☐ a. 4.63 increase in the probability of the event
- ☐ b. 4.63 increase in the logit
- ☐ c. 4.63 increase in the odds of the event
- ☐ d. 4.63 increase in the log odds of the event

Your answer: **c**

Correct answer: **c**

An odds ratio shows the change in the odds, not the change in the logit or the probability.



9. The odds ratio for **Recent_Avg_Gift_Amt** indicates which of the following?

- ☐ a. A one-unit increase in **Recent_Avg_Gift_Amt** yields a 77% increase in the odds of the event.
- ☐ b. A 25-unit increase in **Recent_Avg_Gift_Amt** yields a 77% increase in the odds of the event.
- ☐ c. A 25-unit increase in **Recent_Avg_Gift_Amt** yields a 23% decrease in the odds of the event.
- ☐ d. A one-unit increase in **Recent_Avg_Gift_Amt** yields a 77% increase in the log odds of the event.

Your answer: **c**

Correct answer: **c**

The UNITS statement computed an odds ratio for a 25-unit increase for **Recent_Avg_Gift_Amt**. With an odds ratio of 0.77, there is a $100 \times (0.77 - 1)$ percent change in the odds.



10. The effect plot of **Lifetime_Card_Prom** shows a positive relationship between the number of card promotions and the target. At what value(s) does the plot hold the other predictor variables in the model?

- ☐ a. at their means
- ☐ b. at their medians
- ☐ c. at their maximum values
- ☐ d. at 0

Your answer: **a**

Correct answer: **a**

With no variables in the CLASS statement in this model, the effect plot of **Lifetime_Card_Prom** holds the other predictor variables in the model at their means.

Close

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