## Instructions

Please complete the following lab assignment. You may work on the assignment in groups or on your own. However, to get credit, you must submit your own answers in Canvas. This lab is open note and open book. You may also ask the instructor and the TA questions. Please note that in most cases we will try to guide you towards answering your own question rather than directly providing you with an answer.

**Calculations**

**Q1. Calculate prevalence**

[Numerical Answer]

A physical examination was performed for 8814 adult persons who visited the City A Obesity Center during the month of June. Among these adults, 2089 had metabolic syndrome (MetS). Of these 2089 with metabolic syndrome, 1149 were obese. Of those adults without metabolic syndrome, 2286 were obese.

Calculate the prevalence of obesity in all visitors. (Round your answer to 3 decimal places)

|  |  |
| --- | --- |
| ✅ | 0.39 |

**Q1. Feedback**

A physical examination was performed for 8814 adult persons who visited the City A Obesity Center during the month of June. Among these adults, 2089 had metabolic syndrome (MetS). Of these 2089 with metabolic syndrome, 1149 were obese. Of those adults without metabolic syndrome, 2286 were obese.

Calculate the prevalence of obesity in all visitors. (Round your answer to 3 decimal places)

Prevalence = (1149 + 2286) / 8814

Prevalence = 3435 / 8814

Prevalence = 0.38972

Prevalence = 0.390

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q2. Calculate POR**

[Numerical Answer]

A physical examination was performed for 8814 adult persons who visited the City A Obesity Center during the month of June. Among these adults, 2089 had metabolic syndrome (MetS). Of these 2089 with metabolic syndrome, 1149 were obese. Of those adults without metabolic syndrome, 2286 were obese.

Calculate the prevalence odds ratio of obesity in metabolic syndrome patients compared to those without metabolic syndrome. (Round your answer to 3 decimal places at each step)

|  |  |
| --- | --- |
| ✅ | 2.374 |

**Q2. Feedback**

A physical examination was performed for 8814 adult persons who visited the City A Obesity Center during the month of June. Among these adults, 2089 had metabolic syndrome (MetS). Of these 2089 with metabolic syndrome, 1149 were obese. Of those adults without metabolic syndrome, 2286 were obese.

Calculate the prevalence odds ratio of obesity in metabolic syndrome patients compared to those without metabolic syndrome. (Round your answer to 3 decimal places at each step)

Odds in MetS+ = 1149 / 940

Odds in MetS- = 2286 / 4439

POR = (1149 / 940) / (2286 / 4439)

POR = (1.222) / (0.515)

POR = 2.37282

POR = 2.373

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q3. Logistic assumptions**

[True/False]

A key assumption of logistic regression representing the relationship between the exposure (X) and the outcome (Y) is that the log odds of Y changes linearly with changes in X.

|  |  |
| --- | --- |
| ✅ | True |
|  | False |

**Q3. Feedback**

A key assumption of logistic regression representing the relationship between the exposure (X) and the outcome (Y) is that the log odds of Y changes linearly with changes in X.

This is true. The logistic function assumes that the relationship between the outcome and exposure variables are linear in the log scale across the entire set of data.

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q4. Logistic regression**

[Multiple Answers]

Which of the following relationships/associations can you use a logistic function to model? (Please choose all that apply)

|  |  |
| --- | --- |
| ✅ | a) Outcome (Binary Hypertension: Yes, No), Exposure (Age as a continuous variable) |
|  | b) Outcome (BMI as a continuous variable), Exposure (Age as continuous variable) |
| ✅ | c) Outcome (Binary Cholesterol: > 240 mg/dl, ≤ 240 mg/dl), Exposure (Ethnicity) |
|  | d) Outcome (BMI as a continuous variable), Exposures (Ethnicity, Physical exercise as a binary variable) |
| ✅ | e) Outcome (Binary Blood glucose: ≥ 140 mg/dl, < 140 mg/dl), Exposures (Age as continuous variable, Ethnicity) |

**Q4. Feedback**

Which of the following relationships/associations can you use a logistic function to model? (Please choose all that apply)

The correct answer options are a, c, and e. The logistic model can be used to model the relationship/association between a continuous, binary, or categorical exposure and a binary outcome.

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q5. Logistic Regression**

[Multiple Answers]

Consider a logistic regression model assessing the relationship between a single exposure (X = Age) and outcome (Y = Asthma).

Which of the following does the regression coefficient b1, obtained represent? (Please choose all that apply)

|  |  |
| --- | --- |
|  | a) The estimated increase in the odds of asthma per unit increase in the value of age |
| ✅ | b) The estimated increase in the log odds of asthma per unit increase in the value of age |
|  | c) The estimated increase in the probability of asthma per unit increase in the value of age |
|  | d) The estimated increase in the odds of asthma per unit increase in the odds of the value of age |
| ✅ | e) The exponent of b1 is the odds ratio of asthma associated with a one-unit increase in the value of age |

**Q5. Feedback**

Consider a logistic regression model assessing the relationship between a single exposure (X = Age) and outcome (Y = Asthma).

Which of the following does the regression coefficient b1, obtained represent? (Please choose all that apply)

The correct answer options are b and e. The obtained regression coefficient represents linear increase in the log odds of the outcome, given a unit change in the exposure. The exponent of the regression coefficient gives us the odds ratio.

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q6.**

[Multiple Choice]

Investigators conducted a cross-sectional study of 189 inner-city school children to examine the relationships between reading scores, gender, and referrals to remedial reading programs. Of these children, 59 (31.22%) were recommended for remedial reading classes and 130 (68.78%) were not. The outcome variable was being recommended for remedial reading instruction (1 = yes, 0 = no), and the two predictors were students’ reading score on a standardized test (X1 = the reading variable) and gender (X2 = gender). The standardized reading scores ranged from 40 to 125 points, with a mean of 64.91 points and a standard deviation of 15.29 points. The gender predictor was coded as 1 = boy and 0 = girl. The gender distribution was nearly even with 49.21% (n = 93) boys and 50.79% (n = 96) girls.

The results of the logistic regression were as follows:

Table

Description automatically generated

Please select the correct mathematical equation for the given **logistic regression**, predicting the recommendation of remedial reading classes using the variables gender and standardized reading score.

|  |  |
| --- | --- |
| ✅ | a. log odds ( REMEDIAL)= 0.5340 + (-0.0261)\*READING + (0.6477)\*GENDER |
|  | b. odds ( REMEDIAL)= 0.5340 + (-0.0261)\*READING + (0.6477)\*GENDER |
|  | c. |
|  | d. |

**Q6. Feedback**

Investigators conducted a cross-sectional study of 189 inner-city school children to examine the relationships between reading scores, gender, and referrals to remedial reading programs. Of these children, 59 (31.22%) were recommended for remedial reading classes and 130 (68.78%) were not. The outcome variable was being recommended for remedial reading instruction (1 = yes, 0 = no), and the two predictors were students’ reading score on a standardized test (X1 = the reading variable) and gender (X2 = gender). The standardized reading scores ranged from 40 to 125 points, with a mean of 64.91 points and a standard deviation of 15.29 points. The gender predictor was coded as 1 = boy and 0 = girl. The gender distribution was nearly even with 49.21% (n = 93) boys and 50.79% (n = 96) girls.

The results of the logistic regression were as follows:

Table

Description automatically generated

Please select the correct mathematical equation for the given **logistic regression**, predicting the recommendation of remedial reading classes using the variables gender and standardized reading score.

The correct answer is a, based on the formula on page 293 of the book.

log (odds) = b0 +b1x

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q7.**

[Multiple Choice]

Investigators conducted a cross-sectional study of 189 inner-city school children to examine the relationships between reading scores, gender, and referrals to remedial reading programs. Of these children, 59 (31.22%) were recommended for remedial reading classes and 130 (68.78%) were not. The outcome variable was being recommended for remedial reading instruction (1 = yes, 0 = no), and the two predictors were students’ reading score on a standardized test (X1 = the reading variable) and gender (X2 = gender). The standardized reading scores ranged from 40 to 125 points, with a mean of 64.91 points and a standard deviation of 15.29 points. The gender predictor was coded as 1 = boy and 0 = girl. The gender distribution was nearly even with 49.21% (n = 93) boys and 50.79% (n = 96) girls.

The results of the logistic regression were as follows:

Table

Description automatically generated

If the difference between two students on the standardized reading score was 40 points, the odds of recommended remedial reading would decrease from 1.00 to \_\_\_\_\_\_\_.

|  |  |
| --- | --- |
|  | a. 0.0261 |
|  | b. 0.261 |
|  | c. 0.9742 |
| ✅ | d. 0.3520 |

**Q7. Feedback**

Investigators conducted a cross-sectional study of 189 inner-city school children to examine the relationships between reading scores, gender, and referrals to remedial reading programs. Of these children, 59 (31.22%) were recommended for remedial reading classes and 130 (68.78%) were not. The outcome variable was being recommended for remedial reading instruction (1 = yes, 0 = no), and the two predictors were students’ reading score on a standardized test (X1 = the reading variable) and gender (X2 = gender). The standardized reading scores ranged from 40 to 125 points, with a mean of 64.91 points and a standard deviation of 15.29 points. The gender predictor was coded as 1 = boy and 0 = girl. The gender distribution was nearly even with 49.21% (n = 93) boys and 50.79% (n = 96) girls.

The results of the logistic regression were as follows:

Table

Description automatically generated

If the difference between two students on the standardized reading score was 40 points, the odds of recommended remedial reading would decrease from 1.00 to \_\_\_\_\_\_\_.

The correct answer is d. The odds of recommended remedial reading decreases from 1 to e^(-0.0261) with one unit increase in standardized reading score, hence for 40 unit difference in the standardized reading score, the odds of recommended remedial reading decreases from 1 to e^(40\*(-0.0261)) = 0.3520

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

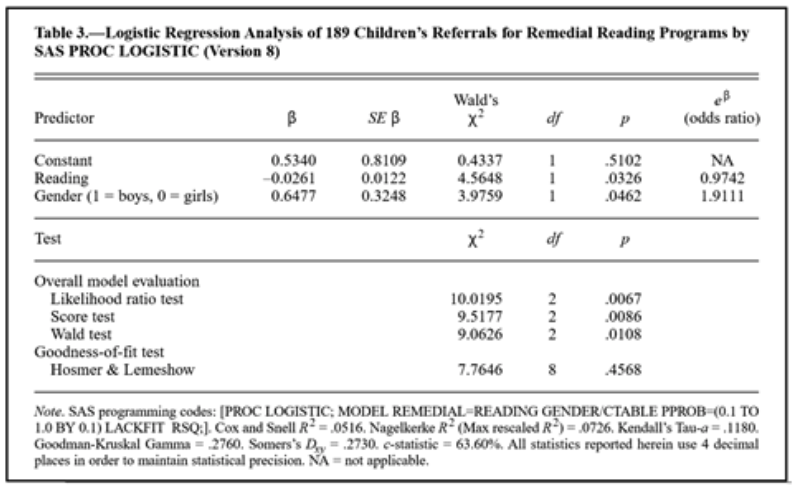
Click the "Next" button below to move on to the next question.

**Q8. Interpret odds**

[Multiple Choice]

Investigators conducted a cross-sectional study of 189 inner-city school children to examine the relationships between reading scores, gender, and referrals to remedial reading programs. Of these children, 59 (31.22%) were recommended for remedial reading classes and 130 (68.78%) were not. The outcome variable was being recommended for remedial reading instruction (1 = yes, 0 = no), and the two predictors were students’ reading score on a standardized test (X1 = the reading variable) and gender (X2 = gender). The standardized reading scores ranged from 40 to 125 points, with a mean of 64.91 points and a standard deviation of 15.29 points. The gender predictor was coded as 1 = boy and 0 = girl. The gender distribution was nearly even with 49.21% (n = 93) boys and 50.79% (n = 96) girls.

The results of the logistic regression were as follows:



Interpret the calculated odds of recommended remedial reading for the standardized reading score, using the answer to the question above.

|  |  |
| --- | --- |
|  | a. The 40 unit change in standardized reading score will decrease the odds of referral to remedial reading from 1.00 to 0.0261 |
|  | b. The 40 unit change in standardized reading score will increase the odds of referral to remedial reading from 1.00 to 0.0261 |
| ✅ | c. The 40 unit change in the standardized reading score will decrease the odds of referral to remedial reading from 1.00 to 0.3520 |
|  | d. The 40 unit change in standardized reading score will increase the odds of referral to remedial reading from 1.00 to 0.9742 |

**Q8. Feedback**

Investigators conducted a cross-sectional study of 189 inner-city school children to examine the relationships between reading scores, gender, and referrals to remedial reading programs. Of these children, 59 (31.22%) were recommended for remedial reading classes and 130 (68.78%) were not. The outcome variable was being recommended for remedial reading instruction (1 = yes, 0 = no), and the two predictors were students’ reading score on a standardized test (X1 = the reading variable) and gender (X2 = gender). The standardized reading scores ranged from 40 to 125 points, with a mean of 64.91 points and a standard deviation of 15.29 points. The gender predictor was coded as 1 = boy and 0 = girl. The gender distribution was nearly even with 49.21% (n = 93) boys and 50.79% (n = 96) girls.

The results of the logistic regression were as follows:

Table

Description automatically generated

Interpret the calculated odds of recommended remedial reading for the standardized reading score, using the answer to the question above.

The correct answer is C.

The interpretation is that 40 units change in standardized reading score will decrease the odds of remedial reading from 1 to 0.3520.

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q9. Predicted probability**

[Multiple Choice]

Investigators conducted a cross-sectional study of 189 inner-city school children to examine the relationships between reading scores, gender, and referrals to remedial reading programs. Of these children, 59 (31.22%) were recommended for remedial reading classes and 130 (68.78%) were not. The outcome variable was being recommended for remedial reading instruction (1 = yes, 0 = no), and the two predictors were students’ reading score on a standardized test (X1 = the reading variable) and gender (X2 = gender). The standardized reading scores ranged from 40 to 125 points, with a mean of 64.91 points and a standard deviation of 15.29 points. The gender predictor was coded as 1 = boy and 0 = girl. The gender distribution was nearly even with 49.21% (n = 93) boys and 50.79% (n = 96) girls.

The results of the logistic regression were as follows:

Table

Description automatically generated

What is the predicted probability of being recommended for remedial reading in a male child with a reading score of 55 points?

|  |  |
| --- | --- |
|  | a. 0.2538 |
| ✅ | b. 0.4369 |
|  | c. 0.7976 |
|  | d. 0.5233 |

**Q9. Feedback**

Investigators conducted a cross-sectional study of 189 inner-city school children to examine the relationships between reading scores, gender, and referrals to remedial reading programs. Of these children, 59 (31.22%) were recommended for remedial reading classes and 130 (68.78%) were not. The outcome variable was being recommended for remedial reading instruction (1 = yes, 0 = no), and the two predictors were students’ reading score on a standardized test (X1 = the reading variable) and gender (X2 = gender). The standardized reading scores ranged from 40 to 125 points, with a mean of 64.91 points and a standard deviation of 15.29 points. The gender predictor was coded as 1 = boy and 0 = girl. The gender distribution was nearly even with 49.21% (n = 93) boys and 50.79% (n = 96) girls.

The results of the logistic regression were as follows:

Table

Description automatically generated

What is the predicted probability of being recommended for remedial reading in a male child with a reading score of 55 points?

The correct answer is b.

P = 1/ 1+(e^ -(0.5340+(-0.0261\*55) + (0.6477\*1)))

   = 1/1+ e^(0.2538)

   = 1/1+1.2889

   = 0.4369

This is equation 7.5 from section 7.4.3 of the textbook.

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q10.**

[Multiple Choice]

Investigators conducted a cross-sectional study of 189 inner-city school children to examine the relationships between reading scores, gender, and referrals to remedial reading programs. Of these children, 59 (31.22%) were recommended for remedial reading classes and 130 (68.78%) were not. The outcome variable was being recommended for remedial reading instruction (1 = yes, 0 = no), and the two predictors were students’ reading score on a standardized test (X1 = the reading variable) and gender (X2 = gender). The standardized reading scores ranged from 40 to 125 points, with a mean of 64.91 points and a standard deviation of 15.29 points. The gender predictor was coded as 1 = boy and 0 = girl. The gender distribution was nearly even with 49.21% (n = 93) boys and 50.79% (n = 96) girls.

The results of the logistic regression were as follows:

Table

Description automatically generated

What is the odds ratio for remedial reading for boys to girls?

|  |  |
| --- | --- |
| ✅ | a. 1.911 |
|  | b. 1.6477 |
|  | c. 1.0233 |
|  | d. 1.544 |

**Q10. Feedback**

Investigators conducted a cross-sectional study of 189 inner-city school children to examine the relationships between reading scores, gender, and referrals to remedial reading programs. Of these children, 59 (31.22%) were recommended for remedial reading classes and 130 (68.78%) were not. The outcome variable was being recommended for remedial reading instruction (1 = yes, 0 = no), and the two predictors were students’ reading score on a standardized test (X1 = the reading variable) and gender (X2 = gender). The standardized reading scores ranged from 40 to 125 points, with a mean of 64.91 points and a standard deviation of 15.29 points. The gender predictor was coded as 1 = boy and 0 = girl. The gender distribution was nearly even with 49.21% (n = 93) boys and 50.79% (n = 96) girls.

The results of the logistic regression were as follows:

Table

Description automatically generated

What is the odds ratio for remedial reading for boys to girls?

The correct answer is a.

OR males/females  = e^(0.6477) = 1.911

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q11.**

[Multiple Choice]

Investigators conducted a cross-sectional study of 189 inner-city school children to examine the relationships between reading scores, gender, and referrals to remedial reading programs. Of these children, 59 (31.22%) were recommended for remedial reading classes and 130 (68.78%) were not. The outcome variable was being recommended for remedial reading instruction (1 = yes, 0 = no), and the two predictors were students’ reading score on a standardized test (X1 = the reading variable) and gender (X2 = gender). The standardized reading scores ranged from 40 to 125 points, with a mean of 64.91 points and a standard deviation of 15.29 points. The gender predictor was coded as 1 = boy and 0 = girl. The gender distribution was nearly even with 49.21% (n = 93) boys and 50.79% (n = 96) girls.

The results of the logistic regression were as follows:

Table

Description automatically generated

Interpret the **odds ratio** you calculated for the question above.

|  |  |
| --- | --- |
|  | a. The adjusted odds ratio for the recommendation of remedial reading is 1.6477 comparing boys to girls |
|  | b. The crude odds ratio for the recommendation of remedial reading is 1.023 comparing boys to girls. |
|  | c. The adjusted odds ratio for recommendation of remedial reading is 1.544 comparing girls to boys. |
|  | d. The crude odds ratio for recommendation of remedial reading is 0.5233 comparing boys to girls. |
| ✅ | e. The adjusted odds ratio for the recommendation of remedial reading is 1.911 comparing boys to girls. |

**Q11. Feedback**

Investigators conducted a cross-sectional study of 189 inner-city school children to examine the relationships between reading scores, gender, and referrals to remedial reading programs. Of these children, 59 (31.22%) were recommended for remedial reading classes and 130 (68.78%) were not. The outcome variable was being recommended for remedial reading instruction (1 = yes, 0 = no), and the two predictors were students’ reading score on a standardized test (X1 = the reading variable) and gender (X2 = gender). The standardized reading scores ranged from 40 to 125 points, with a mean of 64.91 points and a standard deviation of 15.29 points. The gender predictor was coded as 1 = boy and 0 = girl. The gender distribution was nearly even with 49.21% (n = 93) boys and 50.79% (n = 96) girls.

The results of the logistic regression were as follows:

Table

Description automatically generated

Interpret the **odds ratio** you calculated for the question above.

The correct answer is e. Since there are other variables in the equation, this is an adjusted odds ratio and not a crude ratio.

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q12.**

[Multiple Choice]

A cross-sectional study was conducted in Texas to evaluate the association between residential proximity to major roadways (primary exposure) and CNS tumor diagnosis (binary outcome, Yes, No) in children between the period of 1995-2009.

The variables adjusted for include birth weight (grams), maternal age at birth (years), gender of the child (Female = 1, Male=0) and maternal smoking status (Yes=1, No=0). The primary exposure was binary (Residential proximity to a major roadway, < 500m = 1, ≥ 500m = 0). The type 1 error rate is set at 0.05.

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

Which of the following is a correct **logistic regression equation** for the table provided?

|  |  |
| --- | --- |
|  | a) Odds (children diagnosed with CNS tumor│X1,X2,X3,X4,X5) = -3.1747 + 0.4153(residential proximity<500) + 0.0224(maternal age) - 0.1410(Female gender) - 0.0009(birthweight) + 0.6299(Maternal smoker) |
|  | b) Log Odds (children diagnosed with CNS tumor│X1,X2,X3,X4,X5 ) = -3.1747 + 0.4153(residential proximity<500) + 0.0224(maternal age) + 0.1410(Female gender) + 0.0009(birthweight) + 0.6299(Maternal smoker) |
| ✅ | c) Log Odds (children diagnosed with CNS tumor│X1,X2,X3,X4,X5) = -3.1747 + 0.4153(residential proximity<500) + 0.0224(maternal age) - 0.1410(Female gender) - 0.0009(birthweight) + 0.6299(Maternal smoker) |
|  | d) Probability (children diagnosed with CNS tumor│X1,X2,X3,X4,X5 ) = -3.1747 + 0.4153(residential proximity<500) + 0.0224(maternal age) - 0.1410(Female gender) - 0.0009(birthweight) + 0.6299(Maternal smoker) |

**Q12. Feedback**

A cross-sectional study was conducted in Texas to evaluate the association between residential proximity to major roadways (primary exposure) and CNS tumor diagnosis (binary outcome, Yes, No) in children between the period of 1995-2009.

The variables adjusted for include birth weight (grams), maternal age at birth (years), gender of the child (Female = 1, Male=0) and maternal smoking status (Yes=1, No=0). The primary exposure was binary (Residential proximity to a major roadway, < 500m = 1, ≥ 500m = 0). The type 1 error rate is set at 0.05.

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

Which of the following is a correct **logistic regression equation** for the table provided?

The correct answer option is c. The equation should be written in 'log odds' and should consider the positive or negative signs associated with the regression coefficient.

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q13.**

[Multiple Choice]

A cross-sectional study was conducted in Texas to evaluate the association between residential proximity to major roadways (primary exposure) and CNS tumor diagnosis (binary outcome, Yes, No) in children between the period of 1995-2009.

The variables adjusted for include birth weight (grams), maternal age at birth (years), gender of the child (Female = 1, Male=0) and maternal smoking status (Yes=1, No=0). The primary exposure was binary (Residential proximity to a major roadway, < 500m = 1, ≥ 500m = 0). The type 1 error rate is set at 0.05.

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

Which of the following is a correct interpretation for the logistic regression coefficient for **residential proximity**?

|  |  |
| --- | --- |
|  | a) The odds of CNS tumor for a child living within 500m of a major road increases by 0.4153 in comparison to living 500m or more from a major road, keeping maternal age, gender, birthweight and maternal smoking status constant. |
|  | b) The log odds of CNS tumor for a child living within 500m of a major road increases by 0.4153 in comparison to living 500m or more from a major road, keeping maternal age, gender, birthweight and maternal smoking status constant. |
|  | c) The probability of CNS tumor for a child living within 500m of a major road increases by 0.4153 in comparison to living 500m or more from a major road, keeping maternal age, gender, birthweight and maternal smoking status constant. |
|  | d) The log odds of CNS tumor for a child living within 500m of a major road multiplies 0.4153 times in comparison to living 500m or more from a major road, keeping maternal age, gender, birthweight and maternal smoking status constant. |
| ✅ | e) There is no significant statistical association between proximity to a major road and log odds of CNS tumor, keeping maternal age, gender, birthweight and maternal smoking status constant. |

**Q13. Feedback**

A cross-sectional study was conducted in Texas to evaluate the association between residential proximity to major roadways (primary exposure) and CNS tumor diagnosis (binary outcome, Yes, No) in children between the period of 1995-2009.

The variables adjusted for include birth weight (grams), maternal age at birth (years), gender of the child (Female = 1, Male=0) and maternal smoking status (Yes=1, No=0). The primary exposure was binary (Residential proximity to a major roadway, < 500m = 1, ≥ 500m = 0). The type 1 error rate is set at 0.05.

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

The correct answer choice is e. The type 1 error rate is set at 0.05. The P-value of the regression coefficient for residential proximity is greater than 0.05 (i.e 0.253).

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q14.**

[Multiple Choice]

A cross-sectional study was conducted in Texas to evaluate the association between residential proximity to major roadways (primary exposure) and CNS tumor diagnosis (binary outcome, Yes, No) in children between the period of 1995-2009.

The variables adjusted for include birth weight (grams), maternal age at birth (years), gender of the child (Female = 1, Male=0) and maternal smoking status (Yes=1, No=0). The primary exposure was binary (Residential proximity to a major roadway, < 500m = 1, ≥ 500m = 0). The type 1 error rate is set at 0.05.

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

Which of the following is a correct interpretation for the logistic regression coefficient for **birth weight?**

|  |  |
| --- | --- |
|  | a) The odds of CNS tumor for a child increases by 0.0009 for every unit increase in birthweight (grams), keeping residential proximity, maternal age, gender, and maternal smoking status constant. |
| ✅ | b) The log odds of CNS tumor for a child reduces by 0.0009 for every unit increase in birthweight (grams), keeping residential proximity, maternal age, gender, and maternal smoking status constant. |
|  | c) The probability of CNS tumor for a child increases by 0.0009 for every unit increase in birthweight (grams), keeping residential proximity, maternal age, gender, and maternal smoking status constant. |
|  | d) The log odds of CNS tumor for a child multiplies 0.0009 times for every unit increase in birthweight (grams), keeping residential proximity, maternal age, gender, and maternal smoking status constant. |
|  | e) The log odds of CNS tumor for a child increases by 0.0009 for every unit increase in birthweight (grams), keeping residential proximity, maternal age, gender, and maternal smoking status constant. |

**Q14. Feedback**

A cross-sectional study was conducted in Texas to evaluate the association between residential proximity to major roadways (primary exposure) and CNS tumor diagnosis (binary outcome, Yes, No) in children between the period of 1995-2009.

The variables adjusted for include birth weight (grams), maternal age at birth (years), gender of the child (Female = 1, Male=0) and maternal smoking status (Yes=1, No=0). The primary exposure was binary (Residential proximity to a major roadway, < 500m = 1, ≥ 500m = 0). The type 1 error rate is set at 0.05.

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

Which of the following is a correct interpretation for the logistic regression coefficient for **birth weight?**

The correct answer choice is b. The logistic regression coefficient should be interpreted in terms of log odds and should consider the sign (positive or negative) of the regression coefficient.

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q15.**

[Multiple Choice]

A cross-sectional study was conducted in Texas to evaluate the association between residential proximity to major roadways (primary exposure) and CNS tumor diagnosis (binary outcome, Yes, No) in children between the period of 1995-2009.

The variables adjusted for include birth weight (grams), maternal age at birth (years), gender of the child (Female = 1, Male=0) and maternal smoking status (Yes=1, No=0). The primary exposure was binary (Residential proximity to a major roadway, < 500m = 1, ≥ 500m = 0). The type 1 error rate is set at 0.05.

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

Which of the following is a correct interpretation for the logistic regression coefficient for **maternal smoking?**

|  |  |
| --- | --- |
|  | a) The odds of CNS tumor for a child whose mother is a smoker increases by 0.6299 in comparison to a child whose mother is not a smoker, keeping residential proximity, birthweight, maternal age and gender constant. |
|  | b) The log odds of CNS tumor for a child whose mother is a smoker multiplies 0.6299 times in comparison to a child whose mother is not a smoker, keeping residential proximity, birthweight, maternal age and gender constant. |
|  | c) The probability of CNS tumor for a child whose mother is a smoker increases by 0.6299 in comparison to a child whose mother is not a smoker, keeping residential proximity, birthweight, maternal age and gender constant. |
| ✅ | d) The log odds of CNS tumor for a child whose mother is a smoker increases by 0.6299 in comparison to a child whose mother is not a smoker, keeping residential proximity, birthweight, maternal age and gender constant. |
|  | e) The log odds of CNS tumor for a child whose mother is a smoker reduces by 0.6299 in comparison to a child whose mother is not a smoker, keeping residential proximity, birthweight, maternal age and gender constant. |

**Q15. Feedback**

A cross-sectional study was conducted in Texas to evaluate the association between residential proximity to major roadways (primary exposure) and CNS tumor diagnosis (binary outcome, Yes, No) in children between the period of 1995-2009.

The variables adjusted for include birth weight (grams), maternal age at birth (years), gender of the child (Female = 1, Male=0) and maternal smoking status (Yes=1, No=0). The primary exposure was binary (Residential proximity to a major roadway, < 500m = 1, ≥ 500m = 0). The type 1 error rate is set at 0.05.

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

Which of the following is a correct interpretation for the logistic regression coefficient for **maternal smoking?**

The correct answer choice is d. The interpretation should be given in terms of 'log odds' and should consider the sign (positive or negative) associated with the regression coefficient.

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q16.**

[Multiple Choice]

A cross-sectional study was conducted in Texas to evaluate the association between residential proximity to major roadways (primary exposure) and CNS tumor diagnosis (binary outcome, Yes, No) in children between the period of 1995-2009.

The variables adjusted for include birth weight (grams), maternal age at birth (years), gender of the child (Female = 1, Male=0) and maternal smoking status (Yes=1, No=0). The primary exposure was binary (Residential proximity to a major roadway, < 500m = 1, ≥ 500m = 0). The type 1 error rate is set at 0.05.

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

Calculate the odds ratio associated with **maternal smoking**, given the logistic regression coefficient provided.

|  |  |
| --- | --- |
|  | a) 0.6299 |
| ✅ | b) 1.8774 |
|  | c) 0.0418 |
|  | d) 2.0568 |

**Q16. Feedback**

A cross-sectional study was conducted in Texas to evaluate the association between residential proximity to major roadways (primary exposure) and CNS tumor diagnosis (binary outcome, Yes, No) in children between the period of 1995-2009.

The variables adjusted for include birth weight (grams), maternal age at birth (years), gender of the child (Female = 1, Male=0) and maternal smoking status (Yes=1, No=0). The primary exposure was binary (Residential proximity to a major roadway, < 500m = 1, ≥ 500m = 0). The type 1 error rate is set at 0.05.

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

Calculate the odds ratio associated with **maternal smoking**, given the logistic regression coefficient provided.

The correct answer choice is b.

Exponent (0.6299) = 1.8774

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q17.**

[Multiple Choice]

A cross-sectional study was conducted in Texas to evaluate the association between residential proximity to major roadways (primary exposure) and CNS tumor diagnosis (binary outcome, Yes, No) in children between the period of 1995-2009.

The variables adjusted for include birth weight (grams), maternal age at birth (years), gender of the child (Female = 1, Male=0) and maternal smoking status (Yes=1, No=0). The primary exposure was binary (Residential proximity to a major roadway, < 500m = 1, ≥ 500m = 0). The type 1 error rate is set at 0.05.

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

Which of the following is a correct interpretation for the odds ratio associated with **maternal smoking**?

|  |  |
| --- | --- |
|  | a) The log odds for CNS tumor for a child whose mother is a smoker is 1.8774 times that of a child whose mother is not a smoker, keeping residential proximity, birthweight, maternal age and gender constant. |
| ✅ | b) The odds for CNS tumor for a child whose mother is a smoker is 1.8774 times that of a child whose mother is not a smoker, keeping residential proximity, birthweight, maternal age and gender constant. |
|  | c) The log odds ratio for CNS tumor for a child whose mother is a smoker increases by 1.8774 in comparison to a child whose mother is not a smoker, keeping residential proximity, birthweight, maternal age and gender constant. |
|  | d) The odds ratio for CNS tumor for a child whose mother is a smoker increases by 1.8774 in comparison to a child whose mother is not a smoker, keeping residential proximity, birthweight, maternal age and gender constant. |
|  | e) The odds ratio for CNS tumor for a child whose mother is a smoker reduces by 1.8774 in comparison to a child whose mother is not a smoker, keeping residential proximity, birthweight, maternal age and gender constant. |

**Q17. Feedback**

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

Which of the following is a correct interpretation for the odds ratio associated with **maternal smoking**?

The correct answer choice is b. The exponent of the logistic regression coefficient gives us odds ratio. The odd ratio should be interpreted in terms of 'odds' or 'odds ratio', not log odds or probability.

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q18.**

[Multiple Choice]

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

Calculate the 95% CI for the odds ratio associated with **maternal smoking** given the logistic regression coefficient and CI provided.

|  |  |
| --- | --- |
|  | a) (0.5799, 0.6799) |
| ✅ | b) (1.7859, 1.9737) |
|  | c) (0.0118, 0.0718) |
|  | d) (1.5568, 2.5568) |

**Q18. Feedback**

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

Calculate the 95% CI for the odds ratio associated with **maternal smoking** given the logistic regression coefficient and CI provided.

The correct answer choice is b. Exponent (0.5799, 0.6799) = (1.7859, 1.9737)

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q19.**

[Multiple Choice]

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

Calculate the odds ratio associated with **birth weight** given the logistic regression coefficient provided.

|  |  |
| --- | --- |
| ✅ | a) 0.9991 |
|  | b) 1.2646 |
|  | c) 3.4356 |
|  | d) 0.4565 |

**Q19. Feedback**

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

Calculate the odds ratio associated with **birth weight** given the logistic regression coefficient provided.

The correct answer choice is a. Exponent (-0.0009) = 0.9991

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q20.**

[Multiple Choice]

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

Calculate the 95% confidence interval of the odds ratio associated with **birth weight** given the logistic regression coefficient and CI provided.

|  |  |
| --- | --- |
|  | a) (0.5678, 0.7867) |
|  | b) (1.3556, 3,6758) |
| ✅ | c) (0.9987, 0.9994) |
|  | d) (0.9991, 0.9993) |

**Q20. Feedback**

The table obtained after carrying out a logistic regression is shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CNS Tumor | Coefficient | Std. Error | Z | P Value | 95% Confidence Interval | |
| Residential Proximity | 0.4153 | 0.3633 | 1.14 | 0.253 | -0.2968 | 1.1274 |
| Maternal Age | 0.0224 | 0.0235 | 0.96 | 0.339 | -0.0236 | 0.0684 |
| Gender | -0.1410 | 0.2982 | -0.47 | 0.636 | -0.7254 | 0.4433 |
| Birthweight | -0.0009 | 0.0001 | -5.35 | <0.001 | -0.0013 | -0.0006 |
| Maternal Smoking | 0.6299 | 0.7352 | 0.86 | 0.006 | 0.5799 | 0.6799 |
| \_CONS | -3.1747 | 1.6661 | -1.91 | 0.076 | -6.4404 | 0.0907 |

Calculate the 95% confidence interval of the odds ratio associated with **birth weight** given the logistic regression coefficient and CI provided.

The correct answer choice is c. Exponent (-0.0013, -0.0006) = (0.9987, 0.9994)

Please make sure you understand why this is the correct answer. You may use the "Previous" button below to update your answer if your original answer was incorrect.

Click the "Next" button below to move on to the next question.

**Q21. Optional Feedback**

**Optional**: Please feel free to leave any comments below about the usefulness of this lab. Which parts were helpful? What could I do to improve it? What is still unclear?