

# DM-Spring-2020-Q4-Grade

80% (16/20)

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- ✓ 1. Poisson distribution is specified by
- ☒ A 1 parameter
  - ☐ B 2 parameters
  - ☐ C 3 parameters
  - ☐ D Poisson distribution does not have parameters
  - ☐ E I do not know
- ✓ 2. The type of dependent variable in Poisson Regression is
- ☐ A Integer
  - ☒ B Count
  - ☐ C Ratio
  - ☐ D Interval
  - ☐ E I do not know
  - ☐ F Binary
- ✓ 3. Overdispersion in Poisson Regression occurs when
- ☐ A  $\text{var}(Y|X) > \text{var}(Y)$
  - ☒ B  $\text{var}(Y|X) > \text{mean}(Y|X)$
  - ☐ C Variance is decreasing
  - ☐ D I do not know
- ✓ 4. The model of Poisson Regression is specified by the following formula
- ☒ A  $\ln(\lambda) = xb$
  - ☐ B  $\ln(y) = e^{(xb)}$
  - ☐ C  $\ln(y) = e^{(xb)} / (1 + e^{(xb)})$
  - ☐ D  $\ln(\lambda) = e^{(xb)} / (1 + e^{(xb)})$
  - ☐ E I do not know

- ✓ 5. We can estimate Poisson Regression in R using function
- ☐ A lm()
  - ☒ B glm()
  - ☐ C flm()
  - ☐ D poisson()
  - ☐ E I do not know
- ✓ 6. Which one of these is the measure for goodness of fit for Poisson Regression?
- ☐ A Ordinal R<sup>2</sup>
  - ☒ B Chi-square
  - ☐ C I do not know
  - ☐ D There are not measure for it
- ✓ 7. Which one of these is the correct interpretation of the coefficient of Poisson Regression?
- ☐ A For a 1-unit increase in X, we expect a b1 unit increase in Y.
  - ☒ B For a 1-unit increase in X, we expect b1 percentage increase in Y.
  - ☐ C For a 1-percentage increase in X, we expect b1 percentage increase in Y.
  - ☐ D For a 1-percentage increase in X, we expect b1 unit increase in Y.
  - ☐ E I do not know
- ✗ 8. Count data is continuous
- ☒ A Yes
  - ☐ B No
  - ☐ C I do not know
- ✓ 9. The logistic model is estimated by way of
- ☐ A Ordinary least squares
  - ☒ B Maximum likelihood estimation
  - ☐ C Negative binomial distribution
  - ☐ D I do not know

- ✓ 10. As a result of estimation of coefficients
- ☒ A We do not have the formula, an iterative algorithm must be used
  - ☐ B The explicit formula of coefficients exists
  - ☐ C I do not know
  - ☐ D We can obtain different values for coefficients
- ✗ 11. In Poisson regression...
- ☐ A The asymptotic distribution of the maximum likelihood estimates is multivariate normal.
  - ☐ B The distribution of the maximum likelihood estimates is multivariate normal.
  - ☒ C The asymptotic distribution of the maximum likelihood estimates is multivariate Poisson distribution.
  - ☐ D I do not know
- ✓ 12. Pseudo R-Squared Measures are calculated based on (if any)
- ☒ A Deviance
  - ☐ B Chi-squared value
  - ☐ C I do not know
- ✗ 13. The formula for the raw residual is
- ☐ A The difference between the actual response and the estimated value from the model
  - ☐ B The squared difference between the actual response and the estimated value from the model
  - ☒ C The difference between the actual response and the estimated value from the model by dividing by the standard deviation
  - ☐ D I do not know
- ✓ 14. Which of these is NOT the type of residuals
- ☐ A Deviance Residual
  - ☐ B Pearson Residual
  - ☐ C Raw Residual
  - ☒ D Poisson Residual
  - ☐ E I do not know

- ✓ 15. In the case of intercept-only model
- ☒ A The mean of the dependent variable equals the exponential value of the intercept
  - ☐ B The mean of the dependent variable equals the intercept
  - ☐ C The mean of the dependent variable equals 0
  - ☐ D I do not know
- ✓ 16.  $\ln(\lambda) = 0.6 - 0.2 * \text{female}$  [ $\lambda$  = the average number of articles] Note:  $e^{(-0.2)}=0.78$
- ☐ A One unit increase in female brings a 0.2 decrease in  $\ln(\lambda)$ .
  - ☐ B Being female decreases the average number of articles by 0.78 percent
  - ☒ C Being female decreases the average number of articles by 22%
  - ☐ D I do not know
- ✓ 17. While running the Poisson Regression we will have never faced with the value of  $\lambda$
- ☒ A 0
  - ☐ B 1
  - ☐ C 2
  - ☐ D I do not know
- ✓ 18. Why does not quasi-Poisson model have AIC?
- ☒ A Quasi-Poisson is used quasi-likelihood instead of log-likelihood estimates.
  - ☐ B Quasi-Poisson does not use iterative estimation
  - ☐ C I do not know
- ✓ 19. Why Poisson regression is called log-linear?
- ☒ A Because we use a log link to estimate the logarithm of the average value of the dependent variable
  - ☐ B Because we use a log values of independent variable
  - ☐ C Because we use a log value of an independent variable is transformed to linear
  - ☐ D I do not know

✗ 20. Formulate the Null hypothesis for chi-squared and deviance test.

- ☒ A The distance between actual and predicted values is insignificant
- ☐ B The distance between actual and predicted values is 0
- ☐ C There is a significant difference between actual and predicted values.
- ☐ D I do not know