

Pembentukan Model Regresi Double Poisson = The Construction of Double Poisson Regression Models

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Abstrak

Untuk memodelkan data cacah atau count data, model regresi yang biasa digunakan adalah model regresi Poisson. Model regresi Poisson mengasumsikan mean pada variabel respon sama dengan variansinya atau dikenal dengan istilah equidispersion. Apabila regresi Poisson digunakan untuk kondisi selain equidispersion, yaitu overdispersion dan underdispersion, maka nilai standard error dari estimasi parameter model menjadi tidak konsisten. Salah satu alternatif model regresi untuk mengatasi overdispersion maupun underdispersion adalah model regresi double Poisson. Model regresi double Poisson mengasumsikan variabel respon berdistribusi double Poisson. Distribusi double Poisson diperoleh menggunakan definisi dari keluarga distribusi double eksponensial. Parameter pada model regresi double Poisson diestimasi menggunakan metode maksimum likelihood dan solusi dari persamaan log-likelihoodnya diselesaikan menggunakan metode numerik Newton-Raphson. Penerapan model regresi double Poisson pada data kepiting tapal kuda menunjukkan bahwa hanya variabel weight yang berpengaruh signifikan terhadap banyak kepiting satelit yang berkerumun ke sarang kepiting tapal kuda betina. Selain itu, interpretasi dari model regresi double Poisson juga serupa dengan model regresi Poisson sebab keduanya menggunakan fungsi penghubung log.

.....To model count data, the most commonly used regression model is the Poisson regression model. The Poisson regression model assumes that the mean of the response variable is equal to the variance, also known as equidispersion. If Poisson regression is used for conditions other than equidispersion, namely overdispersion and underdispersion, then the standard error value of the estimated model parameters becomes inconsistent. One of the alternative regression models to overcome overdispersion and underdispersion is the double Poisson regression model. The double Poisson regression model assumes that the response variable has a double Poisson distribution. The double Poisson distribution is obtained using the definition of the double exponential distribution family. The parameters in the double Poisson regression model were estimated using the maximum likelihood method and the solutions of the log-likelihood equation were solved using the Newton-Raphson numerical method. The application of the double Poisson regression model to the horseshoe crab data shows that only the variable weight has a significant effect on the number of satellite crabs swarming to the nests of female horseshoe crabs. In addition, the interpretation of the double Poisson regression model is also similar to the Poisson regression model because both use a log link function.