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Application of Logistic Regression on Passenger Survival Data of the Titanic Liner

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Abstract—This empirical research aims to predict the distinguishing variables of passengers who did or did not survive while traveling in the famous Titanic liner, which sunk in 1912. The binary logistic regression analysis empirically analyzes the secondary dataset available for 1046 passengers. Variables such as passenger's gender, age, family composition, ticket class, number of parents with/without children, and number of siblings and/or spouses were opted to examine the differences between the binary dependent variable (Passenger Survived/ Not Survived). The study results indicate that all the variables are statistically significant in the model, with passenger's gender being the most significant predictor followed by passenger's ticket class. The survival chances of passengers decreased for male passengers compared to their counterparts (female passengers) for the sample data [Exp(β)=0.080], for the passengers of age more than 21 years compared to passengers of age less than and equal to 21 years [Exp(β)=0.576], and for passengers with ticket class second and third compared to first-class ticket holders [Exp(β)=0.412]. In contrast, there was a greater chance of survival for families traveling together with parents, siblings, spouses compared to single travelers [Exp(β)=1.823].

Keywords—Binary, Dichotomous, Generalized Linear Model (GLM), Logistic Regression