DAT 610

Module Six Exercise

**Principal Component Analysis**

Chart, histogram

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A screenshot of a computer

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Calendar

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After completing a principal component analysis on the data set, it was found that Component 1 explains most of the variation within the data set. When looking at the loading of Component 1, it can be seen that Medical Payment (0.648), Personal Injury (0.578), and Bodily Injury (0.432), are the highest variables and can be recommended as Key Risk Indicators (KRI). If a further inquiry is required, Component 2 can be looked into, with its highest variable being Comprehensive at 0.867.

**Linear Regression**

Table

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For each unit increase in collision payouts, there is a 0.0007 decrease in the likelihood to recommend buying that make of car. For each unit increase in property damage, there is a 0.0006 decrease in the likelihood to recommend buying that make of car. For each unit increase in comprehensive, there is a 0.0039 decrease in the likelihood to recommend buying that make of car. For each unit increase in personal injury, there is a 0.0047 decrease in the likelihood to recommend buying that make of car. For each unit increase in medical payment, there is a 0.0057 decrease in the likelihood to recommend buying that make of car. For each bodily injury, there is a 0.0005 increase in the likelihood to recommend buying that make of car. With the linear regression in mind, medical payment and potentially personal injury could be seen as KRIs because they have the largest values out of all the coefficients.

**Logistic Regression**

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To look for potential KRIs in a logistic regression analysis, you can look at the Estimate column. The coefficients that have the highest value are most likely KRIs. In this data set, medical payment, comprehensive, and property damage have around the same value at around -2.4. These three variables would be recommended as KRIs.

**Set of KRIs**

From the above analysis, I would recommend an appropriate set of KRIs to Company XYZ for determining the lowest total average insurance loss for a particular auto model: Medical Payment, Personal Injury, and Comprehensive. Medical Payment was prominent in the PCA, linear regression, and logistic regression. Personal Injury was prominent in the PCA and linear regression. Comprehensive was somewhat prominent in the PCA and prominent in the logistic regression.

References

DAT 610. (2016). *Module Six Exercise Guidelines and Rubric*. Manchester, NH: Southern New Hampshire University.

DAT 610. (2016). *Exercise Six Additional Materials*. Manchester, NH: Southern New Hampshire University.