

Research paper on a decision of uncertainty

Technology, Artificial Intelligence



QNT/561

I need to travel for a distance of 1064 miles and select a personal insurance policy that will cover the expenses. Car rental is much more convenient and cheaper compared to flying. I do my research and identify a rental company called travel safe. They offer \$9.99 a day on the weekends and \$18.99 per day if a client chooses to extend including the \$3.00 charge. In addition, an extra \$12.99 will need to be paid as accident insurance. Notably, it is indicated that if offered an insurance claim, \$500 will be deducted. In this situation, I need to make an informed choice between taking the offered car rental insurance or the individual using a probability theorem.

Concept Application

Research shows that there are 1 in 16 odds that cars travelling through the route I am using end up in accidents. I must therefore use my statistical skills to make an informed decision on whether to take the offered policy or forfeit. The procedure about to partake will enable me analyze the disadvantages or advantages of taking the insurance claim or taking the individual strategy.

Appropriate Probability Concepts

I decided to use Bayes' theorem to determine the most appropriate measure. Bayes' theorem is extremely helpful in assisting business people make informative decisions involving information. The theorem makes use of data to predict a situation instead of using hunches or guess work. Two arbitrary events are observed and analyzed using data from previous occurrences to compute a probability that a given diagnosis will take place — $P(A, B)$ —. The formula is the generalized formula of the law that is used in

finance to weigh risk using evidence issued and make choices (McClave, Benson, & Sincich 2011).

Therefore, Bayes' theorem could be used to a certain the most appropriate and most favorable method of transporting my goods.

Statistical Analysis Outcomes

Taking into consideration the 1 in 16 likelihood of being in an accident, it is translated to 6.25% possibility. to begin my calculations in determining whether or not to take up the policy, I have to set up variables to examine the uncertainty of the matter. Following is the formula used to establish my decision whether to take up the policy. This will improve my chances of making a more informed idea by assessing the risk that I am taking.

Accept Insurance = AI = Purchase Rental Insurance Coverage

Decline Insurance = DI = Refute Rental Insurance Coverage

The probability of being involved in an accident and consequentially needing the insurance policy is 6.25%; $P(AI) = \text{Accept Insurance} = .0625$.

However the chance that I will not be involved in any accident and therefore not utilizing the insurance policy is 93.75%; $P(DI) = \text{Decline Insurance} = .9375$

The probability of being in any accident is .0625 not forgetting the flat deductible \$ 500.00 per occurrence (DE) which can also be written as $P(AI) [(DE)] = \text{Break Even (BE)}$ which is the cost of purchasing the insurance.

$P(AI) [(DE)] = BE$

$(.0625) [\$ 500.00] = \$ 31.25$

The calculations made above are the results of using the theorem to estimate my chances of needing the policy that is 0. 625 which in total costs \$31. 25. This is the cost of the journey if made one way. Therefore, the cost of making the journey back and forth is an even \$62. 50. Ideally, I will spend \$62. 50 if I make the journey both ways that is a high possibility.

Tradeoffs between Accuracy and Precision

This information is used to make the precise calculations to make an accurate decision on the policy issue.

EventProbability

(P)Personal Deductible

(DE)Joint Probability

Two Equally Select HappeningsPosterior Probability

$P(AI) [(DE) (2)] = \text{Total Cost of taking the policy or}$

P (1-DI) [(DE) (2)] Savings for Decline

Accept Insurance. $0.625 \$5002P (. 0625) [(500) (2)]$

Refute Insurance. $0.9375 \$5002 P (. 9375) [(500) (2)]$

Total 1. 0000

Decision Based on Analysis

Both choices offered include risks and losses. No one knows for certain if they would need an insurance cover or not. However, Bayes' method enable people view the risk in a clearer and precise way therefore reducing dramatically the chances of making decisions that may regret in the future. While analyzing this situation, I chose not to take the insurance cover and

take my chances in individual coverage. The insurance was at an expense of \$12. 99 a day not including the tax or the car rental fee. Taking the insurance would mean saving very little after forfeiting travelling by air. In this scenario, the risk was worth taking compared to the insurance policy. I chose to use my personal insurance if anything was to happen. The statistical numbers in place gave me the option to forfeit the policy instead of a \$62. 50 charge.

Conclusion

In conclusion, this mathematical tool is vital in making any types of decisions in business and every day scenarios. It enables the users avoid mistake of making hurriedly decisions which might lead to losses (Cooper & Schindler 2011). However, it is important to note that the number degree of risk also plays a part in the decision making process. For example, a 15% and a 3. 5% risk offer very different thinking ways most people would opt to take the risk if lower compared to the 15%. It is also advisable to always consider using other probability theorems to measure the difference of risks using different calculations.

References

- Cooper, D. R. & Schindler, P. S. (2011). Business research methods (11th ed.). New York, NY: McGraw-Hill/Irwin.
- McClave, J. T., Benson, P. G., & Sincich, T. (2011). Statistics for business and economics (11th ed.). Boston, MA: Prentice Hall.