



Foundation for Critical Thinking

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The Logic of Analyzing a Problem:

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The problem you are analyzing: **improving the risk assessment process**

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The logic of the question you have reasoned through can be found here. Beside each of your answers, you will find checkpoints, or guidelines for making sure you have reasoned well through each element. If you are unclear as to how to interpret any of these "checkpoints," read more deeply about the elements of reasoning and intellectual standards.

Statement of the problem:

ABC Insurance company has been seeing an increase in insurance claims in Montgomery County Maryland over the last few quarters. The company tries to keep their rates as low as possible, so when they start to see a spike in claims in a particular area they decided to look into the data to ensure that customers who are in the highest risk pools are paying the higher premiums.

- The key **question** at issue is...

<--What type of violations have higher amount of claim? <--Which make and model of vehicle cost higher amount to be paid? <--How do we evaluate the aggressiveness of a driver? what are the factors? <--How do we determine the impact levels of accident factors? <--How do we categorize the impact levels?

Clarify the question: Have I stated the question as clearly and precisely as possible? Have I stated the question so as to detail the complexities in it? Does my formulation of the question give me [or others] some unjust advantage?

- The **purpose** of reasoning through the issue is...

The purpose in this effort is to build an evaluation model that ABC insurance company uses to rate their clients. This is necessary so they can charge the correct premiums to those who are higher risk.

Check your purpose: Have I stated the question as clearly and precisely as possible? Have I stated the question so as to detail the complexities in it? Does my formulation of the question give me [or others] some unjust advantage?

- The **information** I need to use in answering this question is...

The information that we use to solve this problem is a data set of traffic violations from Montgomery County Maryland for the last four years. This data contains information about the driver as well as the vehicle that they were driving when the incident occurred. It also contains some information about the

Assess your information: Have I included all the important relevant information? Have I left out any relevant information I would rather not have to consider? Have I checked to see that my information is accurate?

offense such as location, description and what action the officer took (citation, warning etc.).

- The **assumptions** I am making when reasoning through this issue are...

- All drivers are paying their premium according to the risk pool. - Premium amount has been decided after checking driving record. - Customers with below 25 age, paying higher amount than above 25. (irrespective of driving record) - Our analysis only includes drivers who have been ticked by the Police. These drivers will be bucked into the medium, high and very high risk pools. We will assume that the drivers that have not been included in the analysis are lower risk drivers. - Drivers with alcohol consumption are all risk drivers no matter how much they drink. - Drivers that had citations that involved the following are the highest risk: alcohol, fatalities, contributed to an accident, were speeding and were either not wearing seat belts, cause personal injury, property damage, or were in a work zone. Additionally if they were not wearing seat belts and caused damage or personal injury or contributed an an accident are high risk drivers. - We are assuming that all of the other drivers in our data set are medium risk drivers. - We have removed the drivers city and state attributes from our data set and will not be using them in this analysis. This is due to the fact that there is not a lot of variability in these attributes as the dataset is from Montgomery county Maryland, and therefore most of the attribute values for state contain Maryland. While the values for city will have more variability we found they were not good for the analysis we are performing.

Identify assumptions: Do I recognize the beliefs I have taken for granted in reasoning through this issue? In other words, have I uncovered the important assumptions guiding my thinking in this situation? Have I questioned assumptions that may not be based in sound reasoning? Am I holding onto assumptions that cannot be justified based on the evidence?

- The primary **concepts** guiding my reasoning about this issue are...

<-- Driver scoring/ Aggressive driving measures; <-- Risk Pools; <-- Moving violations.

Understand the concepts: Have I identified the main concepts guiding my thinking through this issue? Am I even clear about what a concept is and the role concepts play in human thinking? Have I distorted some idea to fit my vested interest? Do any of my concepts need to be questioned? Have I thought deeply about the concepts I am using? Am I using concepts superficially?

- Some important **implications** of reasoning through this problem well or poorly are...

After running our model with a client's information, the insurance company will obtain a risk level of that client. "Very High" implicates the client is an aggressive driver, "High" means the client is less aggressive, "Medium" indicates the client drives

Recognize the implications: Have I traced out the important implications in this situation? Have I thought through the potential negative as well as positive implications connected with this issue? Are there implications I would rather not face, and so I am refusing to consider them? Have I anticipated the implications of the obvious implications, and then the implications of those implications, and the implications of

carelessly but not aggressive, “None” implies the client tends to drive safely. And then the insurance company would be in a better position to charge an applicable rate to clients who are risky drivers and keep their low rate going for their regular clients. By doing so, they can avoid loss of capital due to large No. of risk claims, and loss of loyal clients.

those implications, and so on, as well?

- The **point of view** from which I am looking at this situation is...

The point of view that we will be analyzing this problem from is that of the insurance company. We will also consider the point of view of the customers, who expect their insurance amount to be more reasonable.

Consider your Point of View: Have I considered all important viewpoints relevant to this situation before formulating my viewpoint? Have I inadvertently distorted some other viewpoints in order to maintain my viewpoint? Have I articulated and considered other ways of looking at the situation, in good faith, before coming to conclusions about how to think and how to act?)

- In reasoning through this issue, the main **inferences** I have made and **conclusion(s)** I have come to, in terms of how to deal with the issue are...

Based on the analysis, a proper classification can be done by this insurance company to place certain clients into risk zones and hence charge a higher premium from them since the no. of insurance claims is increasing. This will ensure that the company wouldn't suffer any major loss, and also will help to keep the low-risk drivers loyal with their existing low rates applicable to them.

Analyze your interpretations: Am I clear about the inferences I have made in coming to this conclusion? Have I considered the fact that any or all of my inferences may be more or less sound? Do my inferences clearly follow from the evidence, or have I failed to consider important information in coming to my conclusions? Can I articulate the assumptions that have led to my inferences? Do I have a vested interest in coming to a particular conclusion, and if so, has this clouded my judgment?

Summary:

While reasoning through the logic of this problem, I have gained the following insights and come to the following decisions.

After going through the logic of the problem, we believe we could improve the risk assessment process used to generate consumer pricing of the insurance companies policies. This will be done by performing various data mining tasks on the traffic violations reported by the Montgomery County Sheriff's department.

Save Conclusions / Finish Problem

If you are unclear as to how to interpret any of these "checkpoints," read more deeply about the elements of reasoning and intellectual standards. We suggest the following materials:

- [The Thinker's Guide to Analytic Thinking](#)
- [Critical Thinking: Tools for Taking Charge of Your Professional and Personal Life](#)
- [Critical Thinking: Tools for Taking Charge of Your Learning and Your Life](#)

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