PROJECT MATH MINDS

ARE YOU UP FOR THE CHALLENGE OF ACTUARIAL WORK?

In its third year, the Project Math Minds scholarship opportunity is again available. The Project highlights the high level math skills used by the actuarial profession. ('Actuaries' are consistently rated as one of the top math based careers in America.)

Up to three scholarships ranging between $1,000 and $5,000 will be awarded!

PROJECT DESCRIPTION

Purpose & Goal:

The purpose of the Project Math Minds assignment is to introduce the student to common insurance concepts through the use of practical examples. This example in the assignment revolves around the National Catastrophe Fund.

The National Catastrophe Fund* (known as the NCF or the "Nat Cat Fund") needs enough money to cover the losses that it expects to have in the next calendar year. The primary goal of this Project Math Minds project is to develop an estimate of the potential losses that the Nat Cat Fund will bear in the next year.

Student Role:

The student will act as the actuary who determines the estimate of total losses in the coming year for the NCF. The actuary is to prepare a formal report for the director of the NCF, presenting his/her final estimate of the liability with all supporting work and documentation included.

Background Information:

The NCF currently provides government funds to reimburse homeowner losses for the following 3 catastrophes: Hurricanes, Wildfires, and Blizzards. A large portion of homes are already insured through many private companies (State Farm, All State, etc.); the Nat Cat Fund exists to reimburse these insurers for up to 10% of their total losses for any of the 3 events.

The NCF therefore determines its estimate of annual losses to be 10% of the expected homeowner losses from these 3 events.

Your Assignment:

The student is to complete an estimate of the total losses that can be expected to incur in the next year for the Nat Cat Fund. A single source of data, outlining historical experience of losses from these 3 events is to be used as the basis for all results.

The report should include the following:

- Executive summary of results
- Statement of problem
- Data
- Methodology
- Analysis
- Conclusions
- Recommendations

The report can also include an appendix of tables to illustrate any work, if necessary.

Note: The student should note that there is no one right answer to the Project Math Minds assignment. Demonstration of actuarial concepts and thought are at the center of this assignment.

DO YOUR RESEARCH HERE

Use the data found in the excel spreadsheet named Project Data Source. The link is located on the same Web Page as this PDF or go to:
http://www.actuarialfoundation.org/programs/youth/math_minds.shtml

PROJECT SCORING GUIDELINES

I. Creative Ability - 10 points

Does the solution presented satisfy the given problem? Is the solution more than a straight-forward answer to the problem? Does the solution involve some sophistication in its justification?

II. Use of Mathematics - 15 points

a) Does the project use more than just arithmetic and basic statistics (like mean, median, mode)? Does the student use statistical regression appropriately to analyze trends?

b) Are mathematical conclusions displayed using computer graphics for better visualization?

c) If mathematical proof is involved, are steps clear, concise, and lead directly from prior statements?

d) If simulation or approximation methods are used, are they appropriate to the problem? Is there an analysis of possible errors involved in using these methods?

III. Actuarial Thought - 30 points

a) Was there a procedural plan for obtaining a solution? What mathematics was involved in this solution?

b) Were the variables clearly recognized and defined? Is there evidence that the student understands the variables/terminology being used?

c) Does the finalist recognize the data's limitations?

d) Does the finalist understand the project's ties to related research?

e) Does the finalist have an idea of what further research is needed?

f) Did the finalist cite scientific literature?

IV. Thoroughness - 15 points

How completely was the problem covered?

V. Skill - 5 points

Was the project completed under adult supervision, or did the student work mainly alone?

VI. Clarity - 25 points

a) How clearly does the finalist discuss his/her project and explain the purpose, procedure, and conclusions? Is there real understanding of the project?

b) Does the written material reflect that understanding?

c) Are important phases of the project presented in an orderly manner?

d) How clearly is the data presented?

e) How clearly are the results presented?

f) How well does the project *display* explain the project?

DUE DATES

Your *Project Math Minds* research project need to be postmarked by March 15, 2010. Winners will be announced by April 15, 2010.

SUBMISSIONS

Your essay should be limited to approximately twenty typed, double-spaced pages (one inch margins). Please number your pages and include your last name and school on each page in the header or footer. Do not fold your submission. There is no limit on the supporting graphics; however, each graphic must be referenced in the essay as to how it supports the recommendation.

Submit your completed project to:

mathminds@actfnd.org

OR

The Actuarial Foundation
Project Math Minds
475 N. Martingale Rd., Ste. 600
Schaumburg, IL 60173-2226

???QUESTIONS???

Actuaries, aka Cranium Coaches, are available to guide you and answer any questions you may have as you develop your project. Email all questions to mathminds@actfnd.org. Allow 1 week to receive a response.

*The use of the project name, National Catastrophe Fund, is for project use only and not to be confused with any other project, group or organization of similar name or program.