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Story Problem Analysis System

Examinations in mathematically-based curiculae inevitably require the ubiquitous story problem. While multiple-choice problems are easy to grade, they are presented in a manner which performs much of the important understanding process for the student, leaving them with the much easier task of merely computing some quantity. Such problems require that the student:

- select the appropriate formulae;
- select the correct information from the problem;
- solve the equations using the information;
- indicate the correct answer;
- make a decision.

The solutions for grading purposes of such problems require that many contingencies be pre-planned.

While the problem designer has no difficulty implementing a conditional grading strategy, the author's experience with graders has not been uniformly positive. Either unforseen contingencies arise, or the grading algorithm is defective. The professor frequently must regrade problems for consistency.

A solution to this problem is currently being created. The Story Problem Analysis System (SPAS) consists of:

- a course-wide equation list, for all equations discussed in the class;
- a problem generator, capable of the generation of both constant text and random values for each individual (both data and summary quantities);
- the solution to the problem, stated in equations and decision inequalities;
- a low-level decision-making engine. This section, the heart of the system, will consist of comparisons of the answers from the student to the correct answers. The system will self-correct to ensure that partial credit is fully obtained.

The SPAS system, when completed, will allow the teacher to administer and grade such long-answer problems, and handle certain broad classes of errors. This will facilitate both consistency in grading, and research into student preparation and learning. Finally, once a problem is created, the time previously spent grading may be spent considering why the problem did not work like it was supposed to!