The solution to a problem posed by a course assignment or exam question may expose students' ability to select among and practically apply multiple course-relevant skills. Furthermore, a student's mastery of the same skill may be exposed in their solutions to multiple problems within a particular activity or assessment. Traditional approaches to grading assign a scalar score to each problem independently. Thus, while weaknesses in students' answers may be easily attributed to common set of deficits, the grading system does not systematically expose these weaknesses across multiple problems in a manner amenable for systematic analysis by the instructor or student.

We describe an alternative approach to grading - where students grades are collected on the granularity of skills demonstrated across multiple problems. These skill-grades are tabulated in a manner that facilitates analysis by the instructor and students. For example, each student's deficits can be explicitly listed on exam results, instructors can identify common and individual misunderstandings when designing lessons and individualized interventions.

We report on our approach to skills-based grading, the software we have developed to tabulate grades collected in this manner, and the lessons we have learned from using skills-based-grading for several semesters in two courses.