Case Studies in the Advanced Placement Computer Science Curriculum

Panelists

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Abstract

Beginning in spring 1995, the Advanced Placement Computer Science Examination will include questions based on "Directory Manager", a case study describing the design and development of a program to manage file names in a simulated directory. The "Directory Manager" materials include the following: a problem statement; solution program code; a narrative description and defense of decisions made in the solution process; study questions distributed throughout the narrative to involve the reader in the solution process; sample exam items; and a comprehensive instructors' manual.

Case studies engage students in a kind of "apprenticeship" with an expert programmer. A variety of advantages result from using case studies to teach programming. They provide

- excellent models for student learning;

- context for study and assessment of abstract programming concepts;

- encouragement for students to reflect on their strengths and weaknesses and learn from their experience;

- opportunities for working with large programs without the overhead involved in producing them from scratch.

Case studies represent a swing of the pendulum away from a focus on program synthesis toward a better balance with analytical skills. Thus this change potentially will have a significant impact on the teaching and learning of programming in high schools and colleges.

Panelists will describe the upcoming changes to the examination and the rationale behind these changes. They will also describe a recent pilot study of the "Directory Manager" materials, its results, and experience teaching with "Directory Manager" in high school AP CS courses.

Gail Chapman is ETS Consultant to the AP CS Test Development Committee. She coordinated and helped design the recent pilot study of the "Directory Manager" materials. Owen Astrachan is Director of Undergraduate Studies in the Computer Science Department at Duke University, as well as Chief Faculty Consultant in charge of grading the exam and a former Test Development Committee member. Sarah Fix and Joseph Kmoch are AP CS instructors who participated in the pilot study. Both have several years' experience as AP CS exam readers, supervisors of question grading, College Board consultants, and leaders of workshops for AP CS instructors; in addition, Sarah has been a member of the Test Development Committee since 1989.