"Jump-Starting" Usage of a Web-Based Database of Course Material

Edward F. Gehringer
Department of Electrical & Computer Engineering
North Carolina State University
efg@ncsu.edu

Abstract. The proposer is developing a Web-based database of course materials in computer architecture and computer organization. This database is funded by the National Science Foundation, currently contains about 600 reusable questions, and has been used by dozens of instructors around the world. However, most instructors have used it only sporadically; and have not contributed any of their own questions. This program is an opportunity to "jump-start" usage of the database within the UNC system by providing financial incentives for instructors to contribute problems—which will, in turn, familiarize instructors with using the database, making it much more likely that they will turn to it often in the future.

Introduction. A database of course materials in computer architecture (an important field within computer engineering) and computer organization (an integral part of computer science) is being developed on the World-Wide Web. Its goal is to allow instructors at different institutions to share materials and develop them jointly, thus greatly enhancing the productivity of the time they spend on course preparation. This database comprises problems contributed from the Web sites of courses in computer architecture and computer organization at universities around the world. The site is searchable by classification or fulltext string for problems on particular topics in computer architecture. At this writing, the database contains about 600 problems. We have begun to add lecture notes to the database, and intend to add lab exercises. The software is fully adaptable to other academic fields. In essence, the Computer Architecture Course Database is a prototype for databases of course materials that could be developed in almost any academic field.

The software for the Computer Architecture Database is built on top of WebAssign, a Web-based multimedia exam and homework-grading system developed in the NCSU Physics department, which now has several thousand users at NCSU and throughout the state. Although it shares software with WebAssign, the Computer Architecture database is a totally separate database. To this software, the Computer Architecture database adds the ability to download problems from Web pages and insert them into the database.

An instructor searches for questions by going to the search screen and filling out a form (Figure 1). The system then searches for questions of the given description (say, all questions that include the word "pipeline"). It responds with the text of these questions on a Web page (Figure 2). The instructor can peruse these questions and select appropriate ones for a new test or homework assignment.

Interest in using the database has been high, with about 60 faculty from major research institutions having obtained accounts, as of March 1. Initially, users rated its usefulness at 4 on a scale of 1 to 5, with 5 being high. But in a February 2000 survey, it was discovered that fewer than half of all instructors had accessed the database more than

once during the last semester they taught a computer architecture course. Further, the rate of contributing problems has been low, with only nine instructors contributing. Clearly, if the database is to realize its promise as a vehicle for sharing course materials, instructors must be given more incentive to use the database.
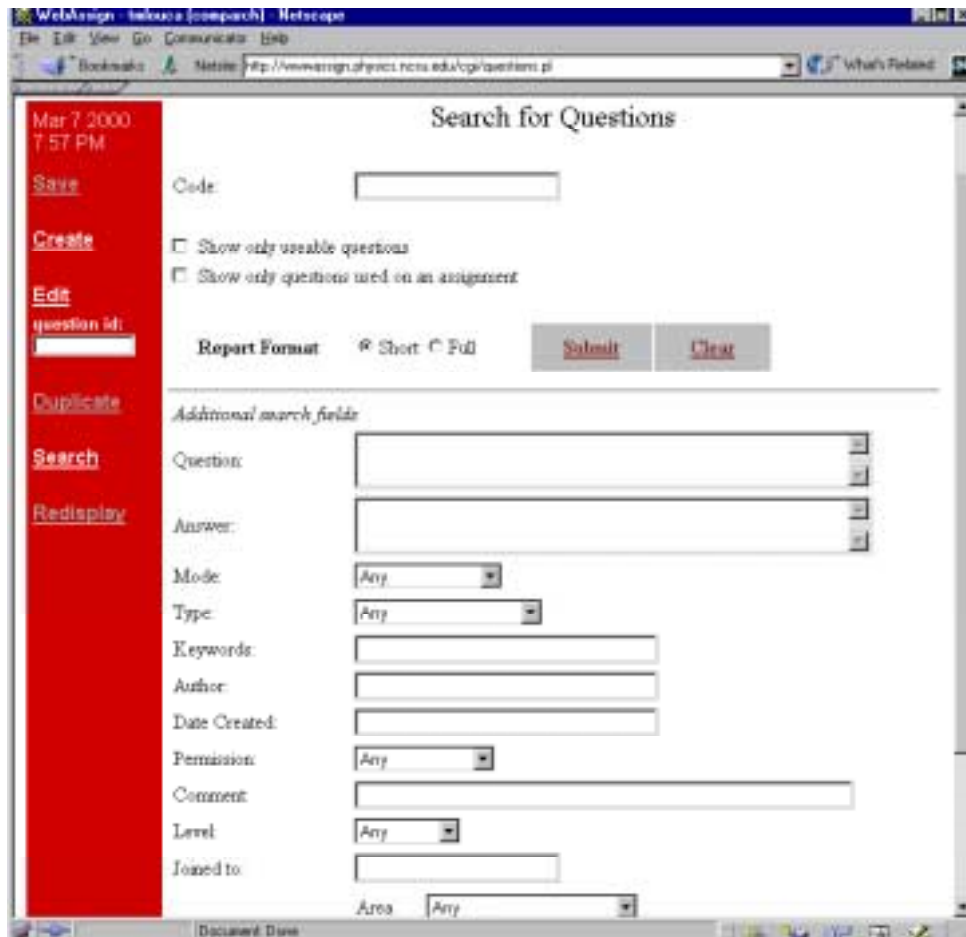

Figure 1. Main search screen

Plan. Could UNC system instructors in computer architecture and computer organization serve as a pilot group for encouraging usage? The proposer's experience with other four-year-college faculty suggests that they could. Last week, the author's project was one of twenty NSF projects "showcased" at the 31st SIGCSE Technical Symposium on Computer Science Education, which is frequented largely by faculty from four-year colleges, rather than major research institutions. During the 2-hour demonstration, a dozen more instructors signed up for accounts. Eleven of them were from four-year colleges, with the other being from a community college. The proposer also announced the database during the "Town Meeting" session of the symposium, and several dozen instructors requested information on obtaining accounts. This is an indication that faculty from four-year colleges, as well as faculty from research institutions, are eager to participate in a project of this type.

To encourage usage of the database within the UNC system, the following is proposed: UNC system instructors in computer architecture and computer organization will be recruited to participate. Each instructor will receive a stipend of $25 per solved homework problem, $35 per on-line lecture, and $100 per examination (with solutions) that is submitted to the database. This will encourage instructors to become familiar with using the database as authors of material. Having participated as authors, they will naturally turn to the database in subsequent semesters when seeking material for their own courses.

This plan offers many benefits to the UNC system. It promises to introduce instructors on many UNC campuses to the latest in instructional technology. It will increase the productivity of the time they spend on course preparation. It will foster sharing of materials across campuses in the system. Finally, it can serve as a model for the rest of the computer-architecture world in sharing course materials, as well as for cooperation in other academic fields within the UNC system.

Budget justification. The three main items in the budget are $18,000 to pay UNC system faculty to submit material to the database, $1,000 for release time for the instructor to recruit participants and manage the submission, and $1,000 for a student to provide technical support, keep track of who has submitted what and how much the consultants are to be paid. In addition to that, there are the required fringe-benefit and overhead amounts.

File Edit View Go Communicator Help

Bookmarks   Netsite: http://www.wacrign.physics.ncsu.edu/cgi/questions.pl   What's Related

WebAssign.dev
Questions

Classes   Assignments   Questions   Grades   Manual   Help Desk   Admin

Mar 7 2000
6:54 PM

Save

Create

Edit
question id:

Duplicate

Search

Redisplay

Results of Your Questions Search

1 - 20 of 167

Next 20 results

Question 1389 Edit or Duplicate
Original source

Question 5. (a) In a microprogrammed stack architecture, what component must be inserted between the microinstruction register and the inputs $C'0, ?$, Cw in the diagram below, in order to assert the line for the function that is to be executed?

Answer: A decoder, more specifically, a $\log 2w$-to-w decoder (assuming w is a power of 2). A demultiplexer can, of course, be used as a decoder if a constant 1 is input to it and the control lines are used to select one of w outputs. But a multiplexer (another popular answer) cannot serve this purpose.

(b) The output of the stack arithmetic unit in the diagram is available during *clock2*. Why is it held in $R2$ until *clock3* instead of being pushed onto the stack immediately?
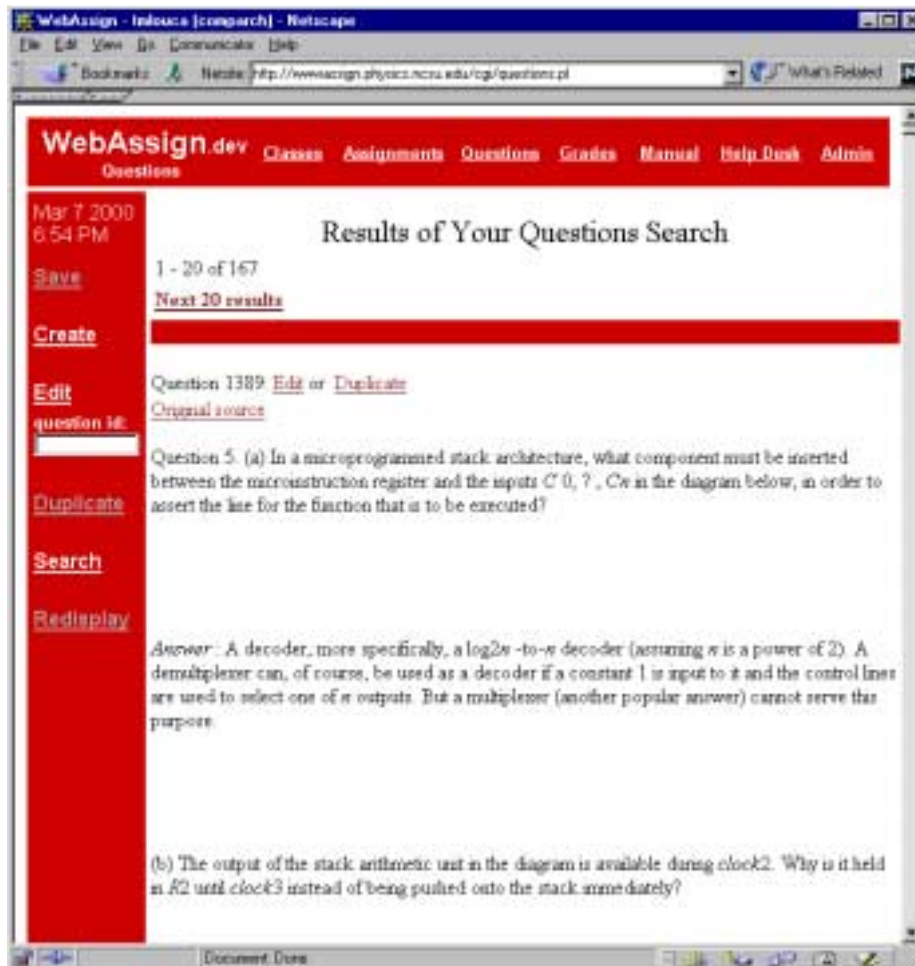
Document Done

Figure 2. Search results.