Course: CPSC 110, Introduction to Software Development  
Writing Unit: No  
Instructor: Hollingsworth  
Methods: Final Exam Question  
LAE Category: Scientific Understanding

**Goal:** Students will develop the ability to analyze questions related to major concepts cover in a field of study.

### Student Outcomes

<table>
<thead>
<tr>
<th>Students will develop the ability to analyze questions related to major concepts cover in a field of study</th>
<th>Number of Topics exceeding expectations</th>
<th>Number of Topics meeting expectations</th>
<th>Number of Topics failing to meet expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stream of Evidence</td>
<td>10 (59%)</td>
<td>6 (35%)</td>
<td>1 (6%)</td>
</tr>
</tbody>
</table>

**Student work examined**

Summarize the tasks used to measure the objective (e.g., exams, research project/paper assignments, presentation, or class assignment) and attach a copy of each (from Departmental assessment instrument).
Overview

A problem presented on the final exam is evaluated; it requires the students to use the concepts of loops and search, as applied to an array, as a data structure. They must also use a variable to store information to be used later. The problem represents a comprehensive summary of some of the concepts in the course, and requires the students to use some creativity in designing and implementing a solution.

Problem Statement

The bugs are happy because it is spring! Start with the bug array in your text; this array has 5 bugs, each different. Use a loop to make each bug flip front-to-back and end-up like they started. After the loop ends, make the shortest bug jump to a winner's platform. Your software must automatically find the shortest bug, and remember it, also by using a loop.

A second stream of evidence assessed was the administration of an LAE goal assessment tool. This evidence was not part of the original plan developed by the department, but the data were collected and are reported here. This will allow faculty to compare such evaluation data in the future, if they so desire.

Scoring Criteria

Explain the criteria used to evaluate student performance in relation to the learning objective (i.e., what constitutes advanced, proficient, partially proficient, not proficient, etc.) Attach copies of measurement instrument or rubric (Departmental assessment instrument or other source).

The scoring for a sample from the final involved a 20-point question. Students who scored from 15 - 20 were deemed to have exceeded expectations for this particular question. Those that scored from 10 - 14 were considered to have met expectations, in terms of the LAE goals. Scores less than 10 were considered to be below the desired performance. In successfully answering the question, the students needed to perform both analytical and synthetic activities. The began by reading the problem and determining exactly what was required to successfully answer the question. They then
had to create a design for the solution in the form of comments used in the Alice programming environment, developed at Carnegie Mellon University. Next, they converted their design into a program, using visual programming tiles. Finally, they had to run their solution and debug any errors they found. The scoring for the standard form is difficult to develop, since there is no history for the course. A sensible measure would be to consider a score of 4 or over to be exceeding expectations, and a score of 3 to 4 to be meeting expectations. Since the MACS department has not discussed this as a group, it would not be wise to establish this scoring based on one faculty member’s ideas.

**Analysis/reflections on the course outcomes**

**Why do you think students performed as they did in this class? What might be done to improve their performance?**

The students answered the question in a manner that suggests they grasped the essential threads of the course. Subjectively, it seemed that several people in the class took this course because they could not get into a section of CPSC 100, and their lack of preparation for the level of the course affected their performance. As people become familiar with the level of the course, performance should improve.

A summary of the LAE assessment data from the standard form is given in the following table. It will be interesting to compare the values with those obtained when the course is taught over several years.

<table>
<thead>
<tr>
<th>This course enabled me to ...</th>
<th>Average Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>... arrive at new conclusions by synthesizing information in a new way.</td>
<td>3.57</td>
</tr>
<tr>
<td>... examine information in novel ways to create new understandings.</td>
<td>3.36</td>
</tr>
<tr>
<td>... investigate information and ideas by generalizing or explaining, to arrive at new conclusions.</td>
<td>3.71</td>
</tr>
<tr>
<td>... use information and ideas through</td>
<td>3.50</td>
</tr>
</tbody>
</table>
hypothesizing to produce new meaning and understandings.

It appears the students felt that the overall objectives of the course were accomplished. Since this is the first year for teaching the course, and the first time the instructor has taught the course, the students had no track record to review prior to taking the course. Also, faculty advisors had no experience on which to base recommending this course to particular students from various majors on campus. It is likely that scores will increase in the future, as students and faculty become more familiar with the course requirements and the academic level of the course.

Reflections on the assessment

How might the course-embedded assessment process be improved? Ideas for possible revisions of listed learning objective(s) related to the goal are especially welcome.