Overview

We are continuing with the Game Maker project. The goal of our data gathering is to determine if students are more inclined to use state diagrams or code based techniques (i.e., pseudo code) to solve simple state based problems in the domain of casual games. This information is important due to the fact that our project is based on the hypothesis that incoming students will have an easier time developing simple games using state diagrams than coding directly in a given programming language (e.g., C++, Java).

Data gathering techniques

Our team is collecting our data in the form of survey and an interview. The target audience of our survey is CSC 101 students. The interview is with a potential instructor of a 100 level game design class.

The survey consists of the following:

1)   An example problem with two solutions: state diagram and pseudo code. This is to ensure that the participants have a baseline for what we expect.

2)   Another example problem in which the participant is asked to solve the problem using one of the two techniques (state diagram or pseudo code). Note that we are not evaluating the solutions for accuracy, but instead, we are concerned with which technique they choose.

3)   Several questions asking the participants what their experience level is with state diagrams and coding respectively.

Note that due to time constraints, we were unable to perform the instructor interview. However, we expect perform the interview for usability instead.

Initial results

We used the lab data gathering exercise in lab to both test out our survey before we pass use with CSC101 students. This information has been helpful in flushing out the questions and provide baseline from students with more experience.

Some of the information that we found useful had to do with our problem description and definition. For instance, we found that several participants thought that they needed to solve it using both techniques, rather than choosing only one. Also we found that some of our naming conventions needed to be more descriptive. Finally, we realized that it is useful to find out if the participant naturally thought about the problem in one way over the other.

Results

We surveyed 44 CSC 101 students. While we did not get as striking results as we may have wanted, we still got some interesting results. We found that 57% of the students chose the state diagram over

pseudo-code. This was not as high as we may have liked but it still shoes tendencies that towards state diagrams. We believe that with a class teaching state machines in addition to the game creator students will prefer state machines.

We asked the students how easy students thought it would be to create simple state diagrams vs pseudo-code. Among the 44 students we found that the average result was in fact average or a score of 3. For the specific results, we had an average of 2.91 for state diagrams and 2.95 for pseudo code. As you can see there is a slight tendency towards state diagrams being easier to use, but this is hardly worth mentioning. These questions were on a scale of 1-5 (where 1 = Easy and 5 = Hard).

As expected, students were more comfortable with pseudo-code than state diagrams. We had an average of 1.34 for state diagrams and 2.70 for pseudo-code. These questions were on a scale of 1-5 (where 1 = None and 5 = Expert).

For the last question of the survey, we wanted to get an idea of what level of interest there was in this sort of class. Our average across the 44 surveys was 3.39. This means while some people were interested others were not. Another way of looking at the results to this questions is the median value. And here we get a 4. This changes the analysis from being that some are interested and others are not to, a lot were somewhat interested and the others were not interested at all. These questions were on the following scale, 0-None, 3-Average, 5-I want it now.

Numerical Results

	Average	Median
Problem 1 (1=State 2=Pseudo)	1.43	1
Question 1	2.91	3
Question 2	2.95	3
Question 3	1.34	1
Question 4	2.70	3
Question 5	3.39	4

Other than what we have commented so far there was one interesting data point that can be presented: A lot of people tried either a state diagram or pseudo-code and couldn't finish it. When they then listed how easy it was to do either task for question 1 or 2 they would say the one they didn't attempt would have been the easier one. We believe this is due to people not thoroughly understanding what they are doing and when they can't figure it out, presuming that the other solution would have been easier.

Improvements

The data we collected was good, but as with any survey one way to make it better would have been to have a larger sample. This would have allowed us to have more confidence in our results. For the data we were gathering, there is not really a better method we could have used. We could have done interviews instead of the survey and that would have given us a more in depth information on each subject, but we would not have been able to interview nearly as many people.