3-ExploringAlgorithms.doc

CS 139 Activity – Exploring Algorithms Inidividual NOTE SHEET

Content Objectives: At the conclusion of this activity students will be able to:

- Identify the four structures of an algorithm
- Evaluate an algorithm for the 5 properties of a good algorithm
- Write a simple algorithm that adheres to the 5 properties

Roles for this activity – Choose these from among your group.

- MANAGER: Keep the group on task.
- RECORDER: Write the group consensus on the worksheet.
- PRESENTER: Write the group consensus on the board and be prepared to explain.
- REFLECTORS: Watch the process of working through the exercise. Complete the Exit Pass.

PART 2 – Examine an algorithm

Read the algorithm for making Jello and then answer the questions that follow:

1. **BOARD** - There are four kinds of statements in the Jello algorithm: action, decision, repetition, and reference (referring to an outside instruction). For each type of statement (use A, D, R, X for action, decision, repetition, and reference respectively) provide one example from the algorithm. On the board, list each type of statement and then the line number of that example. Prop the board when done for instructor review.

A-action

D-decision

R-repetition

X-reference

2. The following questions relate to the quality of this algorithm.
   a. Are there any steps that have more than one action associated with them? If so, which one(s).

   b. Are there any unnecessary steps? If so, which one(s).

   c. Are there any steps that are not clear (are ambiguous or could be interpreted in more than one way? If so, which ones(s).

   d. Will this algorithm complete? In other words, can you get to the point of serving the Jello. If not, where can it go wrong?

   e. Will this algorithm make Jello (it is correct)?

   f. Are there any steps in which we abstract a step (refer to the detail located somewhere else)? If so, which ones.

3. The following questions relate to the quality of the printing algorithm that you find at the end of this packet.
   a. Are there any steps above that have more than one action associated with them? If so, which one(s).

   b. Are there any unnecessary steps? If so, which one(s).

   c. Are there any steps that are not clear (are ambiguous or could be interpreted in more than one way? If so, which ones(s).

d. Will this algorithm complete? In other words, can you get to the point of printing to the printer. If not, where can it go wrong?

e. Will this algorithm correctly print a document on the printer (it is correct).

f. Are there any steps in which we abstract a step (have the detail located somewhere else)? If so, which ones.

**4. BOARD** - Based on these two algorithms, list the characteristics that you think make a good algorithm.

5. Evaluate the algorithms that you brought with you for homework based on the criteria you listed in number 4. Pick the best algorithm out of the group. Explain based on the criteria you developed, why this one is the best. (Return this algorithm to the folder before you leave. Put your name on it if you need it back.)

6. Pick the worst algorithm out of the group. Explain, based on the criteria you developed, why this one is the worst. (Return this algorithm to the folder before you leave. Put your name on it if you need it back.)