“**Mining Student Behavior Models in Learning-by-Teaching Environments”-** Hogyeong Jeong and Gautam Biswas.

This paper discusses methods for analyzing student behaviors and linking them to student performance. At the core of this approach is a hidden Markov model methodology that builds students’ behavior models from data collected in the log files.

**A Data Mining Approach to Analyzing Student Behaviors**

A Data Mining Approach used to analyzing student behaviors involves four steps that appear in most data mining applications:

(i) devise a logging system that records student interactions with the system;

(ii) perform data cleaning by parsing the generated log files and splicing the information into desired activity sequence data that will form the input to the HMM generating algorithm;

(iii) construct the HMM models; and

(iv) interpret generated models as student learning behaviors and compare

models across conditions.

***2.1 Generating the Raw Data: The Logging System***

The raw data corresponds to actions performed by students on the system and the responses

provided by Betty and the mentor agent.

***2.2 Parsing the Log Files***

In this study, we derive students’ behavior patterns by analyzing the sequence of their interactions with the system over multiple sessions. To simplify the interpretation task we

lumped analogous student actions into one aggregate activity

**Table 2: Student Activities and Related Actions**



. For example, all of the map creation and modification activities, i.e., adding concepts and links, deleting concepts and links, and editing nodes and links, were combined into one aggregate activity called Edit Map (EM). All student activities were expressed as the eight activities summarized in

Table 2. Examples of the resultant sequences are shown in Fig. 3 below.

S5213,1,RA,EM,EM,EM,EM,EM,EM,AQ,AQ,AQ,EM,EM,AQ,EM,EM

S5254,1,RA,RA,RA,RA,EM,EM,EM,AQ,AQ,EM,EM,EM,EM,EM,EM,EM

S6236,1,RA,EM,EM,EM,AQ,EM,EM,EM,EM,EM,EM,EM,EM,EM,EM,EM,RQ,QT,EM,EM,AQ,AQ

**Figure 3: Parsed Data for 3 students in session 1**

**Take away for our project on identifying students behaviours in Fathom.**

In the given steps for data mining approach, the step 1 is done. Your task is to complete step 2, in which we have to identify the student activities and related actions as shown in table 2. Later, the log data is to be parsed to identify the sequence of activities performed by each student.

Work till step 2 and report about the progress made.