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E- marker: Moodle plug-in tool to evaluate essay type questions

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Moodle is one of well-known Learning Management Systems (LMS) that helps academics to create varied assessment types such as Multiple Choice Question (MCQ), tutorials, short question and assignments etc. Typically, MCQ questions and small essay type questions are used as formative assessment techniques to evaluate students' performance. MCQ question marking is automated and straight forward in Moodle whereas short essay type questions are marked manually by academics. Subsequently sizes of the class and diversity of courses and assessments are increasing day by day. Therefore, it is a challenging practice to evaluate and grade short type questions on time. Hence the present research was conducted to build a Moodle plug-in to mark essay type questions automatically. Two hundred short essay type questions of the Software Engineering course of the Department of Computing and Information System at University of Wayamba were used as the initial dataset. Initially, the research was conducted in a few steps. Statistical features were derived with Natural Language Processing (NLP) techniques such as number of word used in the answer, number of name entities, number of distinct words, correct words and incorrect words. In addition, several chunking rules were developed to identify the correct usage of the languages. Next, semantic mapper module was developed to extract the semantic features based on provided answers. Finally, several experiment were done to identify the most appropriate feature set to develop a logistic regression model with *scikit* learning machine learning package. The final model showed an accuracy of 82%.

Keywords: Logistic regression, Semantic mapping, Chunk rules