Automated Assessment of Free Text Questions for MOOC Using Regular Expressions

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ABSTRACT

Presently, most platforms used on the selection of Massive Open Online Courses (MOOC) available online have various automated methods of assessment. These type of tools are based on applications that analyze the answers using a pre-correction algorithm. Most of these programs run several types of automatic assessment, but the possible use of the technology for each of them differs with respect to the kind of automation applied. The role of technology in the objective test for online education has become extremely common, so it can be found in various MOOC platforms with this type of questions or quizzes, because the assessment system can be fully computerized (from the test design to its correction and reporting). However, not all of the assessment instruments can be easily implemented in automatic mode with the use of technology. This paper seeks to research and clarify a type of assessment tool in which the use of technologies is quite low, namely, the essay question type and within them, the short answer question type or free text question type, using regular expressions. The large number of students who would be in MOOC prevents a teacher from assessing responses of thousands of students in a finite time without the aid of technology. This research analyzes the results of an MOOC from hundreds of students to verify that the use of regular expressions in an MOOC platform is not only recommended but also necessary.

Keywords: Assessment, Assessment Instrument, Automatic Grader, Massive Online Courses, Open Answer Quizzes, Regular Expressions

INTRODUCTION

The automated assessment of short free text responses has been observed since the mid-fifties, but sufficiently reliable computational systems have not been developed (Mani & Maybury, 1999) for all the cases. However, machines now have much more computing power and can assess a large number of items in a short time (Ezeiza, 2013).

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AUTOMATED ASSESSMENT TOOLS CLASSIFICATION

These types of tools or assessment instruments are based on automatic applications that examine the answers using computer tools that implement a prefixed algorithm. The use of these tools aims to provide consistent corrections in the responses submitted to the automatic system. There are different types of instruments that can go into this classification, but the key characteristic is that it does not involve human intervention, which makes them particularly suitable for use in MOOC.

Some assessment tools that can be marked automatically:

1. Calculated
2. Simple Calculated
3. Calculated Multi-choice
4. Description
5. Essay
6. Matching
7. Embedded Answers
8. Multiple Choice
9. Short-Answer
10. Numerical
11. True/False
12. Third-party question types
13. Surveys and questionnaires
14. Rating scale

This report will seek to clarify the use of technology in short answer questions only, because essay or long answer questions assessment tools have been studied by MIT (Massachusetts Institute of Technology), who that are investigating it for the EDX platform as an essay automatic scoring called AEG (Automated Essay Grading) (Markoff, 2013).

OPPONENTS OF AUTOMATIC ASSESSMENT SYSTEMS

As is to be expected, the technology has plenty of opponents within HumanReaders.org, which has more than 4,000 professional firms of different universities around the globe. They are carrying out a call to all schools and universities to stop using automated assessment tools of summaries, text or written examinations in student graduation tests. Their main contention is that computers cannot read, cannot measure the essential elements of written communication: accuracy, reasoning, matching the exposed evidence, common sense, ethical stance, if the argument is compelling; significant organization, clarity and accuracy, among others (“Human Readers”, 2013).

OVERVIEW OF CURRENT ASSESSMENT SYSTEMS FOR MOOC

Most MOOCs have a mix of assessment systems, usually a single type of assessment tool, multiple choice tests, and sometimes peer review.

Some of the elements that have current platforms are:

1. Multiple choice questions and peer assessment;
2. Multiple choice questions only;
3. Peer review only;
4. Others.

Most platforms studied by Katy Jordan (Jordan, 2013) are xMOOCs, assessments that take place in them are associated with these type of courses. But cMOOCs also has a number of assessment instruments to consider, such as, among others:

1. Peer assessment of the activities carried out;
2. The knowledge generated and collaborative learning.

It can be viewed on samples of assessment tools in some MOOC by Phil Hill (Hill, 2013), that in very few cases an assessment tool for
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