де $i = \overline{1, n}$, n – кількість можливих комбінацій компонент логіко-лінгвістичних моделей речень, а масив $K_i \in K$ належить до множини ключових слів всього електронного текстового документу, то у фрагменті вжито ланцюговий зв'язок, тобто кожне наступне речення за змістом та будовою об'єднуються з попереднім, поступово розвиваючи думку.

За аналогічним принципом сформульовані умови для паралельного зв'язку та всіх видів тематичних прогресій.

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INTRODUCTION TO EDUCATIONAL DATA MINING

E. Borodina, A. Kikot
Poltava National Technical Yuri Kondratyuk University, Ukraine

Educational Data Mining is a relatively new part of Data Mining. It describes a multidisciplinary research field contained Data Mining itself, Statistics, and Machine Learning, applied to Educational Systems.

EDM is concerned with developing methods for exploring the unique and increasingly large-scale data that come from educational settings, and using those methods to better understand students, and the settings which they learn in. Wherever educational information is taken (e.g., universities and intelligent tutoring systems), it often has multiple levels of meaningful hierarchy, which often need to be determined by properties in the data itself, rather than in advance. Issues of time, sequence, and context also play important roles in this field.

It's obvious, that both Data Mining and Educational Data Mining is seeking hiding patterns, but the difference between them is, firstly, a purpose.

EDM is striving by all means to improve educational process, to properly manage students, to give recommendations to lecturers, and, moreover, to get to the bottom of educational phenomenon by understanding how we, after all, truly acquire our skills and abilities.

Ryan S. Baker and Kalina Yacef identified the following four goals of EDM:

1. Predicting students' future learning behavior – With the use of student modeling, this goal can be achieved by creating student models that incorporate the learner's characteristics, including detailed information such as their knowledge, behaviors and motivation to learn. The user experience of the learner and their overall satisfaction with learning are also measured.

2. Discovering or improving domain models – Through the various methods and applications of EDM, discovery of new and improvements to existing models is possible. Examples include illustrating the educational content to engage learners and determining optimal instructional sequences to support the student's learning style.

3. Studying the effects of educational support that can be achieved through learning systems.

4. Advancing scientific knowledge about learning and learners by building and incorporating student models, the field of EDM research and the technology and software used.

Secondly, what sets EDM apart of DM is a quite difficult inner data semantics. It includes both a few important hierarchy levels and relations between different data types.

And thirdly, the difference is methods themselves. Apart from standard methods of DM (clustering, classification, regression, correlation, visualization, statistics, association rule mining etc) EDM uses also some specific ones, e.g. from psychometrics. According to sources, psychometrics is a field of study concerned with the theory and technique of psychological measurement. In EDM field it helps to divide students into groups by perception of information, what in turn allows adapting learning process to any student (to select a proper content type and arrange it in a suitable way).

There are four main users and stakeholders involved with educational data mining. These include:

1. Learners - Learners are interested in understanding student needs and methods to improve the learner's experience and performance.

2. Educators - Educators attempt to understand the learning process and the methods they can use to improve their teaching methods.

3. Researchers - Researchers focus on the development and the evaluation of data mining techniques for effectiveness.

4. Administrators - Administrators are responsible for allocating the resources for implementation in institutions.

EDM generally consists of four phases:

1. The first phase of the EDM process (not counting pre-processing) is discovering relationships in data. This involves searching through a repository of data from an educational environment with the goal of finding consistent relationships between variables. Several algorithms for identifying such relationships have been utilized, including classification, regression, clustering, factor analysis, social network analysis, association rule mining, and sequential pattern mining.

2. Discovered relationships must then be validated in order to avoid overfitting.

3. Validated relationships are applied to make predictions about future events in the learning environment.

4. Predictions are used to support decision-making processes and policy decisions.

During phases 3 and 4, data is often visualized or in some other way distilled for human judgment.

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ОПРЕДЕЛЕНИЕ НАСТУПЛЕНИЯ СОБЫТИЯ С ПРИМЕНЕНИЕМ МОДИФИЦИРОВАНЫХ СТАТИСТИЧЕСКИХ КРИТЕРИЕВ

А.Л. Ляхов, Е.А. Бородина
Полтавский национальный технический университет имени Юрия Кондратюка, Украина

Существует ряд задач в которых необходимо определить степень наступления некоторого события, а также понесённый ущерб от принятия решения, например при аварии на АЭС, определения наличия/отсутствия заболевания у пациента, состояния ценных бумаг на фондовой бирже и т.д.