

# The Application of SVM In English Question Bank Classification

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**Abstract.** Based on the reality of college English education and the characteristics of college English subjects, this paper establishes the database of college English proficiency test questions by adopting the method of classification and teaching students according to their aptitude, which plays an important role in promoting college English education. In the current teaching practice, the teaching method with "engineering response" as the core has been used more and more. On this basis, BILOG-MGV3.0 is used to test the questions in the College English proficiency test, which lays a solid foundation for the design of the questions in the College English proficiency test[1].

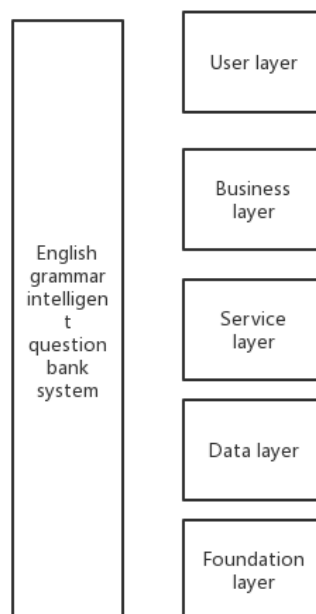
**Keywords:** Question bank construction; College English; Grading test; SVM

## 1 Introduction

The Teaching Requirements for College English Courses ("Curriculum Requirements") promulgated in 2007 was formulated in response to this situation. In the new Curriculum Requirements, it puts forward the requirements of "stratification, stratification and stratification" for college English education to meet the needs of learners at different levels. As the number of students continues to increase and the quality of students continues to improve, many colleges and universities have adopted the "hierarchical" education mode. After years of practical application, it is found that this method can enable teachers to choose various forms of methods according to various levels [2], which can not only arouse students' enthusiasm for learning, but also meet the needs of students at all levels, and improve the overall quality of English classroom. English proficiency test paper is also an important part of the implementation of graded education. The establishment of a scientific, reasonable, efficient and practical grade examination question database is of great significance for promoting the scientific development of grade examination, ensuring the quality of college entrance examination [3], promoting the reform of grade examination, standardizing grade examination, reforming examination form, improving examination method and perfecting the grade examination system. This will contribute to the development of English test in colleges and universities [4].

## 2 Question bank construction and its theoretical basis

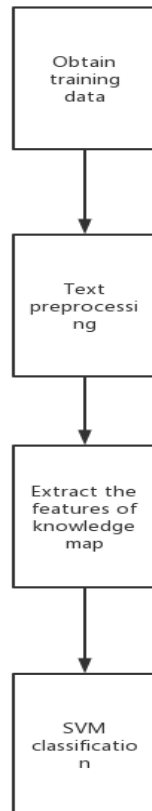
Classical economic data analysis theory (CTT), conceptualization theory (Conceptualization theory) and engineering response theory (IRT) are three main economic data analysis theories. Based on this, it is actually a random sampling principle like the conventional measurement method [3]. Therefore, we can view metric theory as two basic principles, namely the classical metric theory and the engineering response theory. Among them, classical metric theory is the earliest and most practical metric theory, which provides a lot of basis for the measurement methods widely used in today's world. The classical measurement theory focuses on the real score, and its core idea is to regard the score obtained from the test (usually called the observed score) as a straight line combination of the real score (that is, the score that an individual should get under the right testing environment) and the false score (that is, the problems existing in the test or the ability gap between the examinees, etc.). In the research of question type, there are some problems such as reliability, validity, difficulty and differentiation. The item statistics (P value of item difficulty and D value of distinction) obtained by the entry analysis method of CTT depend on different groups of subjects, which makes it difficult to compare different subjects and is not suitable for the establishment of large question banks[5]. As shown in Figure 1:



**Fig. 1:** Overall architecture of the system

Classical measure theory is the earliest and most practical test theory, which is still used as the basis for many tests. Traditional measure theory mainly involves true score theory, which basically views test scores (commonly known as observed scores) as a linear combination of true scores (that is, the scores an individual would have received under appropriate measurement conditions) and false scores (for example, various defects in questions or tests,

differences in student proficiency, or other factors not taken into account by actual performance patterns). Traditional project analysis principles and methods, including reliability, validity, difficulty, differentiation, etc [6]. As shown in Figure 2:



**Fig. 2:** Topic classification flow chart

With the rapid development of economy, the demand for talents in all walks of life is constantly increasing, and the competition in the talent market is becoming increasingly fierce. In order to ensure the scientific, fair, timely and accurate selection of the outstanding talents they need, each industry has adopted the form of "examination"[7].

### 3 Steps of system construction

The construction of question bank is a systematic engineering which needs the guidance of scientific theory. The construction of question bank of college English level examination must start from the following aspects [8].

```
function levelCalc(u) { // Capability value calculation function
  if(header.count === 2) {
    let cnt = answerList.filter(answer =>
```

```

answer.studentAnswer===answer.rightAnswer).length
if(cnt === 1) { // Judge the subject's response
return 0;
} else if(cnt<1) {
return -1; } else {
return 1;

}

let level=answerList[answerList.length- 1].studentLevel;
let difficulty= answerList[answerList.length-1].difficulty;
let p=Math.exp(level- difficulty)/(1 + Math.exp(level- difficulty)); let f=u-p-
level/Math.sqrt(2* Math.PI); let df = p * (p- 1) - 1 /Math.sqrt(2 * Math.PI);
return level- f/df; // Calculation formula and capability value results
}
function informationCalc(difficulty){ // Difficulty for information quantity calculation
let level=answerList[answerList.length-1].studentLevel;
let son = Math.exp(level- difficulty);
let mother = Math.pow(1 + son, 2);
return son/ mother;

```

### 3.1 Define your goals

Through the study of the test objective, a complete set of proposition scheme is developed, and the grading examination outline and grading standards are formulated. Stratified test is an important test that freshman students have to face in the New Year after entering the university. The purpose is to classify students according to the test results, so as to facilitate the arrangement of classroom teaching. The credit system is a kind of conventional reference test, the main content of which is comprehensive and has no inevitable relation with the current credit system. The fundamental principle of argument is to distinguish between different levels, different difficulties, different difficulties. According to different levels and abilities, different students are divided into several classes, and take different ways to treat and manage, so as to better meet the personality development of students at all levels, in order to achieve individualized education [9].

### 3.2 Develop test questions

The compilation of the examination content can be completed jointly by relevant professionals and university teachers with rich educational experience, or the subject can be selected from relevant materials and finally reviewed and approved by relevant institutions. Now, we have established a database of basic English topics for College English and CET-4 and CET-6. According to the principle of topic selection, the database of college English proficiency test

questions is set up [10]. Test questions can be selected not only from the existing database of English proficiency test questions, but also from college English level 4, Level 6 and English Level A and B test questions. At the same time, colleges and universities can independently determine the exam questions for each semester according to their own conditions.[11] As shown in Table 1:

**Table 1.** Basic data statistics of adaptive test ability value and final English score

	Mean value	Standard deviation	Maximum value	Minimum value	Number of samples
Foreign language scores	112.03	14.909	146	72	40
Average of ability	64050	781646	1.999	-1.159	40

### 3.3 Storage and construction of the repository

The construction of the question bank of College English Proficiency test is a systematic work. This paper discusses the construction of the question bank from the perspectives of subject system and the division of teaching objectives. Its quality is directly related to the choice of English proficiency test question bank, question type, question type and the accuracy and reliability of the question type. Using the method of item analysis provides the basis for constructing the question bank and setting up the question objectively and scientifically. The analysis problem should be applied to the equivalent problem of the problem. The equivalent problem of the problem can provide the required parameters for the solution of the problem, and the solution of the problem can ensure the correctness of the problem. Without the above indexes, it is impossible to select, modify and use the question bank of College English proficiency test scientifically, and it is impossible to use the question bank scientifically. However, without corresponding equivalence, it is impossible to form a scientific and unified question bank system. According to the response theory of engineering, BILOG, LOGIST and other computer software is used to analyze the items of the test questions, eliminate the substandard test questions (all answers are right or all answers are wrong, the difficulty cannot be calculated), estimate the difficulty, differentiation and guess degree of the qualified test questions, and then carry out equivalent processing of all test questions, parameter marking, Finally, mark all the questions on a ruler.As shown in Table 2:

**Table 2.** Survey results of the system part and learning perception questions

The template	item	Couldn't agree more	agree	Total proportion	The mean
System part	Q4	17.5%	72.5%	90%	4.08
	Q5	5%	62.5%	67.5%	3.5
	Q6	10%	80%	90%	3.95
	Q7	2.5%	55%	57.5%	3.45
	Q8	12.5%	72.5%	85%	3.93

Feeling of learning	Q9	2.5%	67.5%	70%	3.68
	Q10	17.5%	75%	92.5%	4.05
	Q11	10%	67.5%	77.5%	3.7
	Q12	10%	67.5%	77.5%	3.75
	Q13	12.5%	47.5%	60%	3.55
	Q14	12.5%	60%	72.5%	3.65

The researchers of this project used BILOG-MGV3.0 (Project Analysis and Scoring system) to analyze the project response of 2010 College English Test questions, which mainly included the difficulty, score, project and ability parameter estimation, difficulty determination and unqualified questions. Text classification is a basic technology in the field of information processing.

## 4 Conclusion

In the world of language testing, the problems involved are different from the database problems, and it is not a simple combination of problems. Each question in the test bank should be tested and equivalent in a certain theoretical mode, and given a number of parameters, which reflects the comparability of the test results, the universality of the content, the measurability and economy of the examinees. Therefore, the question bank of college English Level examination is a scientific combination with a large amount of knowledge, and the construction of the question bank is a systematic project.

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