

# An Online Training System to Learn Test and Evaluate on Aptitude

**Nisha K**

Department of Computer Science and Engineering,  
Velammal Engineering College, Chennai, India

**Keerthana V**

Department of Computer Science and Engineering,  
Velammal Engineering College, Chennai, India

**K.C.Aarthi**

**Assistant Professor,**

Department of Computer Science and Engineering,  
Velammal Engineering College, Chennai, India.

---

## ABSTRACT

---

E-Learning became an essential method for learning and is widely used in universities and Training systems rather than paper-based assessment. It is efficient and fast enough and reduces the large amount of material resource. An online training system was developed with computer adaptive testing algorithm which enables to adapt to the examinee's ability. This web application was developed using IDEA as coding tool, with MySQL database and related algorithms. It has the user login, admin login, test management, tutorial management, report generation, etc. This feature can be implemented by allowing students to learn the concepts for aptitude initially, get practiced on all levels of questions and take up scheduled online tests to improve their capability on learning in a linear manner. The core concept of this project is the computer adaptive test algorithm. The test adapts to the user's ability by which the complexity level of the test increases according to the user's capacity and knowledge. The reports for the tests are generated eventually after the completion of the test.

Keywords - computer adaptive test, complexity level, report generation, performance evaluation

---

## I. INTRODUCTION

An aptitude test is a structured assessment that aims to evaluate job candidates' or even existing employees' talent and/or skill in completing certain tasks without any prior knowledge or training. There are lots of different types of aptitude test which can assess a series of core skills such as technical knowledge and comprehension. At present there are several tutorials for aptitude training but not in place for learning practicing and evaluating the concepts and moreover all tutorial trainings have the same standard of questions irrespective of the user's ability. This paper explains about the web application project developed using computer adaptive testing algorithm for taking tests, learning important concepts and practicing topic wise and gives an elaborate report on individual performance upon the tests taken.

## II. LITERATURE REVIEW

Many solutions were proposed to improve aptitude coaching among students. The existing system provides tutorials, study materials, etc. but not all at the one place. Each websites have their own specific criteria of providing materials regarding aptitude. Some of the existing systems have been used for single use cases like materials for self-learning, predefined test systems with fixed set of question banks, etc. The traditional paper method for learning aptitude is time consuming, tedious and delay in evaluation and report generation. On the other hand, the proposed system in this application adapts according to the

user's ability and knowledge level. Students using such systems can access much more resources available with more dynamic and interactive methods such as to learn, practice and take tests, submitting them online and immediate scoring and reports are generated for those tests simultaneously. The main goal of this system is that it provides all facilities at one place.

## III. THE SYSTEM DESIGN

### 3.1. Related Techniques and Development Tools

The system is developed using Java modeling language, adopts the IDEA (IntelliJ IDEA 2018.3.2), Tomcat, JDK technology, and combines with the MySQL database. It is used to support large amount of concurrent test data reception and distribution, authentication, online test and test results, and other functions in Web mode.

MySQL: As database development tool, The MySQL is the most popular relational database management system, which has high speed, small volume, and low overall cost, for this reason, MySQL becomes the first choice of small and medium website development database.

IDEA (IntelliJ IDEA 2018.3.2): As the coding tool, IDEA advocates intelligent coding, and reduces a lot of coding, at the same time, its auxiliary function can generate code automatically, the IDEA also supports custom layout mode, thus different projects could have different layout.

Tomcat: this system adopts Tomcat8.5 as the server. Tomcat is a lightweight application server, which is widely used in small and medium-sized system

JDK: As a Java development kit, it is mainly used for the Java applications on mobile devices and embedded devices.

3.2. The Database design

This system uses MySQL database for data storage and retrieval process. The complete database design is very important for the functioning of the web application. The database table includes the system user table, concept table, practice table, tests table, test questions table, report table, etc. The report table is an example showed here.

3.3. The User Login

The users enter the system through the login name and password where the credentials are verified and processed. Then the user i.e. student, enters into the home page of the web system where all the scheduled tests, tests taken along with their reports are displayed. The user can enter into the concepts and practice page by selecting them from the navbar which directs to the tutorial page. The user can learn topic wise concepts and simultaneously practice them with the available questions. The scheduled tests from the admin can be taken by the users. The tests run with a timer and are based on computer adaptive testing algorithm. After submitting the tests, reports for the particular tests are generated with the score, percentage secured and for each aptitude question: the correct answer and the answer chosen by the user are displayed.

3.4. The admin Login

The administrator is the one who has full access and maintains the web application. The admin is responsible for tests management, question bank setting and user management. The admin side has the interface for scheduling new tests, adding new concepts and materials topic wise.

IV. THE PROPOSED ALGORITHM

This algorithm used for conducting tests is the computer adaptive testing algorithm which is the most important and core part of this online training system. The computer adaptive testing algorithm basically works to adapt to the user's i.e. examinee ability. The algorithm work for the test scheduled by the admins for the users. Each test has a fixed number of questions along with a fixed time. The database contains the question bank along with the complexity level i.e. easy, medium, difficult for each question which is set by the admin. When the user starts a test, initially by using random algorithm an easy question is displayed from the pool of questions. If the user answers it correctly, then the complexity level is increased to next step else it is decreased. Each time when a question is being displayed, it is checked whether that question has been already attended by the user to give integrity. When the terminal condition, the last question is reached the student submits the test and the timer ends finally. Thus by this algorithm, the test adapts to the user's ability.

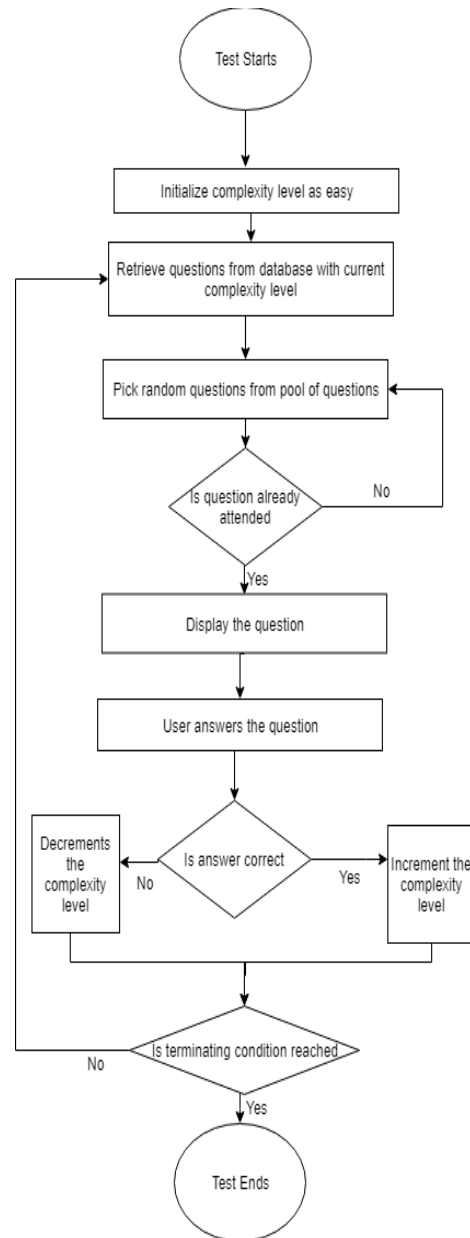


Figure 1: The computer adaptive testing Algorithm used in this system

V. CONCLUSION

This paper presented a computer adaptive testing algorithm designed for the online tests conducted for the students. The core concept of this algorithm is to adapt the test to the user's ability. The user can learn the concepts, practice the sample questions and then attends the scheduled tests. By this way, the user's skill grows in a linear manner toward the aptitude concepts and the reports generated also gives a clear cut picture about his performance from the test. Thus this online training system provides a great platform to learn aptitude and master out the concepts and techniques of it by repeated practicing.

## REFERENCES

- [1] Zhang Yong-sheng, Feng Xiu- mei<sup>1</sup>, Bao Ai-qin<sup>3</sup>. “The Research and Design of Online Examination System.” 2015 IEEE 7th International Conference on Information Technology in Medicine and Education.
- [2] Chen Ying- ying. “The Design and Implementation of Online Examination System with Characteristics of Cloud Service [D]”. Beijing University of Posts and Telecommunications, 2013.
- [3] Zhang Gui-ying. Standardized Online Examination System Design and the Database Construction [J]. Journal of Inner Mongolia Agricultural University. 2012, 33(5- 6):222-225.
- [4] Lu Chang, Xu Guang-ming. Application Research of Web Examination System Based on College [J]. ELSERVER, 2012.
- [5] V.Selvi, R.Sankar, and R.Umarani “ The Design and Implementation of On-Line Examination Using Firewall security”, IOSR Journal of Computer Engineering (IOSR-JCE) , vol 16, issue 6, 2014.
- [6] P. Jain, M. Kumdes, A. Goel, and H. Malviya” Design and Implementation of E-Exam Using Android Platform” International Journal of Engineering Research & Management Technology, vol 3, 2016.