ARTIFICIAL INTELLIGENCE ALGORITHM BASED ONLINE APPLICATION

Dr.R.Jamuna, Associate Professor in Computer Science,S.R.College,Trichy-2, and

Ms.P.Kiruthika Rahini, Lecturer,Department of Computer

Science,S.R.College,Trichy-2

1. INTRODUCTION

Artificial Intelligence is a branch of computer science by which we can create intelligence machines which can behave like a human, think like humans and able to make decisions. Development of Artificial Intelligence based online Application is mainly required by students [1]and learners to prepare themselves for different examinations directly through smart phones and tablets in hands. This is a digital era where every examination system is becoming smarter for the learner and the learned. Artificial Intelligence based learning method is one of the major goals of our project   is that it facilitates thestudents in learning. gaining and improving their knowledge skills with time saving methods. Our application provides them with easiness, so that the users can prepare for interviews, entrance tests or any other competitive examination in a faster and efficient manner. Artificial intelligence methods   provide easier ways for humans to interact with machines. The student can correct by searching techniques of artificial intelligence. Generally manual system involves time consuming process for repeated evaluation processes for large number of questions.

In our project work minimal scale of eight video sections with few questions in a small quantum of time limit is tested. In the real-world applications large number of audios, video lectures and questioning sessions can be incorporated and evaluation can be made much simpler, by the searching techniques of artificial intelligence for effectiveness and time saving efficiencies. Here the sample data is tested on a small scale for the educational application of the students as atrial dataset.

2. LITERATURE SURVEY

The study of paper [1] the data about high students' failure rates in introductory programming courses have been alarming and as many educators, raised a number of important questions regarding prediction aspects. In this paper, we inferred   a comparative study on the effectiveness of educational data mining techniques to early predict students likely to fail in introductory programming courses. Although several works have analyzed these techniques to identify students' academic failures, were found to be effective: (i)the effectiveness of such techniques to identify students likely to fail at early enough stage for action to be taken to reduce the failure rate; (ii) analysis of the impact of data preprocessing and algorithms for fine-tuning tasks, on the effectiveness of the mentioned techniques. The study evaluated the effectiveness of four prediction techniques on two different and independent data sources on introductory programming courses available from a Brazilian Public University .In the second paper referred [2] a   model based on the multilayer perception algorithm was programmed. The result from the test data evaluation showed that the programmed Artificial Neural Network model was able to correctly predict isnd classify the performance of students with Mean Correct Classification Rate CCR of 97.07%. The reference [3] is about MYSQL ,used for programming the algorithm. MySQL is a relational database management system that is capable of handling multiple users and databases. It runs as a server and is installed on your WordPress hosting server.Think of it as a digital filing cabinet that organizes and stores all of the data on your website. Information is retrieved, added, and deleted from tables in the database using a special programming

language called SQL, or Structured Query Language. A SQL instruction to retrieve data is known as a query. Next we refer the JSP implementation that [4] allows Java code and certain predefined actions to be interleaved with static web markup content, such as HTML. The resulting page is compiled and executed on the server to deliver a document. The compiled pages, as well as any dependent Java libraries, contain Java byte code rather than machine code. Like any other .jar or Java program, code must be executed within a Java virtual machine (JVM) that interacts with the server's host operating system to provide an abstract, platform-neutral environment. JSPs are usually used to deliver HTML and XML documents, but through the use of OutputStream, they can deliver other types of data as well

3.EXISTING SYSTEM WITH ITS LIMITATIONS

The existing system is handled manually. The system follows large number of paper work for maintaining student test information. Although there are many mobile based apps that focus on the student online test, where there are limitations on the applications with less   focus on learning or improving knowledge in the curriculum area with large dataset. Most of the other apps are entertainment-based with little focus on the educational paradigm. There are many limitations with the existing systems mentioned with respect to the size of dataset also.

DISADVANTAGES OF EXISTING SYSTEM

- Manual system requires pen and paper. Teachers or evaluators need more time for script checking.
- Student needs to wait to get their results from the   evaluators.
- Lot of the time consumed for each report generation.
- Immediate response to the queries is difficult.
- Manual system is tedious for large data set.
- Existing system has chances of human errors.
-

4. PROPOSED SYSTEM AND ITS ADVANTAGES

The proposed system is developed after a detailed study about the requirements requested by the using the searching principles of artificial intelligence.Write about depth first and breadth first search algorithm briefly. With flow diagram proposed system is based on computer algorithm, where all the limitations of manual system are compensated. Online class and test details of Artificial Intelligence Based Online Application system have simplified the working mode of self testing and assessment schemes more easiness for the implementer to handle large sets of data. Here only a sample population is tested. It creates and makes a user-friendly environment, where the user is provided with much flexibility to manage the time effectively whenever the strength of the students are large and more details for their progress are to be assessed.. It helps the admin also to generate desirable reports more quickly in a time saving mode and which gives way for broad scope of assessment to better results and more predictions in future..

Main advantages are

- simplified the working mode of self testing and assessment schemes.
- user-friendly environment.
- helps the admin to generate desirable reports more quickly to produce better results.

Artificial Intelligence is the study of building agents that act rationally. Most of the time, these agents perform some kind of search algorithm in the background in order to achieve their tasks.

- A search problem consists of: A State Space. Set of all possible states where you can be.
- A Start State. The state from where the search begins.
- A Goal Test. A function that looks at the current state returns whether or not it is the goal state.
- The Solution to a search problem is a sequence of actions, called the plan that transforms the start state to the goal state.
- This plan is achieved through search algorithms.

TYPES OF SEARCH ALGORITHMS:

There are far too many powerful search algorithms in artificial neural networks for assessing the student performance. This work will use the depth first algorithm and breadth first algorithm on a small sample population. [2]

Uninformed Search Algorithms:

The search algorithms in this section have no additional information on the goal node other than the one provided in the problem definition. The plans to reach the goal state from the start state differ only by the order and/or length of actions. Uninformed search is also called Blind search. These algorithms can only generate the successors and differentiate between the goal state and non-goal state.

The following uninformed search algorithms are discussed in this section.

1. Depth First Search
2. Breadth First Search
3. Uniform Cost Search

Each of these algorithms will have:

- A problem graph, containing the start node S and the goal node G.
- A strategy, describing the manner in which the graph will be traversed to get to G.
- A fringe, which is a data structure used to store all the possible states (nodes) that you can go from the current states.
- A tree, that results while traversing to the goal node.
- A solution plan, which the sequence of nodes from S to G.
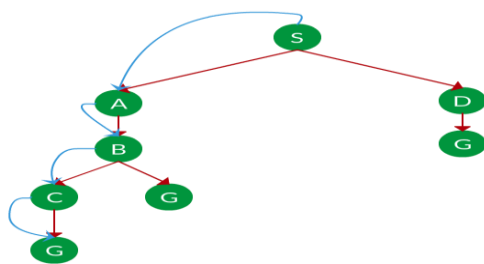
DEPTH FIRST SEARCH ALGORITHM:[6]

Depth-first search (DFS) is an algorithm for traversing or searching tree or graph data structures. The algorithm starts at the root node (selecting some arbitrary node as the root node in the case of a graph) and explores as far as possible along each branch before backtracking. It uses last in- first-out strategy and hence it is implemented using a stack.

Example: DFS

Problem query: Which solution would DFS find to move from node S to node G if run on the graph below?

Solution. The equivalent search tree for the above graph is as follows. As DFS traverses the tree "deepest node first", it would always pick the deeper branch until it reaches the solution (or it runs out of nodes, and goes to the next branch). The traversal is shown in blue arrows.

Path: S -   > A -> B -> C -> G

= the depth of the search tree = the number of levels of the search tree.

= number of nodes in level .

Time complexity: Equivalent to the number of nodes traversed in DFS
Space complexity: Equivalent to how large can the fringe get.
Completeness: DFS is complete if the search tree is finite, meaning for a given finite search tree, DFS will come up with a solution if it exists.
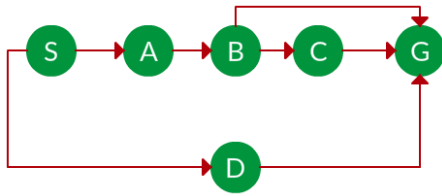**Optimality:** DFS is not optimal, meaning the number of steps in reaching the solution, or the cost spent in reaching it is high.

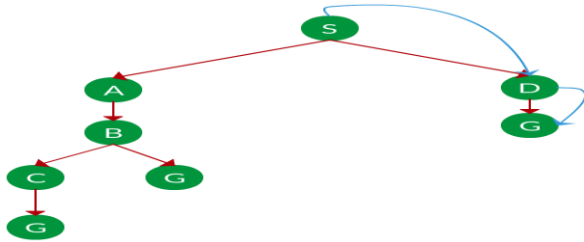## BREADTH FIRST SEARCH ALGORTHM:[6]

Breadth-first search (BFS) is an algorithm for traversing or searching tree or graph data structures. It starts at the tree root (or some arbitrary node of a graph, sometimes referred to as a 'search key'), and explores all of the neighbor nodes at the present depth prior to moving on to the nodes at the next depth level. It is implemented using a queue.

Example: BFS

Problem query: Which solution would BFS find to move from node S to node G if run on the graph below?

Solution. The equivalent search tree for the above graph is as follows. As BFS traverses the tree "shallowest node first", it would always pick the shallower branch until it reaches the solution (or it runs out of nodes, and goes to the next branch). The traversal is shown in blue arrows.

Path: S -> D -> G

= the depth of the shallowest solution.

= number of nodes in level .

Time complexity: Equivalent to the number of nodes traversed in BFS until the shallowest solution.

Space complexity: Equivalent to how large can the fringe get.

Completeness: BFS is complete, meaning for a given search tree, BFS will come up with a solution if it exists.

Optimality: BFS is optimal as long as the costs of all edges are equal.

UNIFORM COST SEARCH:

UCS is different from BFS and DFS because here the costs come into play. In other words, traversing via different edges might not have the same cost. The goal is to find a path where the cumulative sum of costs is the least.
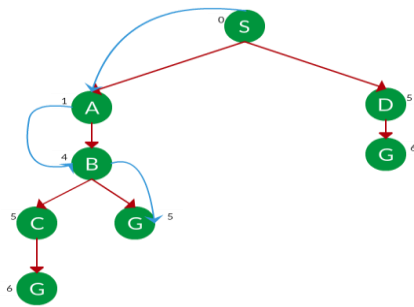
Cost of a node is defined as:

cost(node) = cumulative cost of all nodes from root

cost(root) = 0

Example:

Problem query: Which solution would UCS find to move from node S to node G if run on the graph below?

Solution. The equivalent search tree for the above graph is as follows. The cost of each node is the cumulative cost of reaching that node from the root. Based on the UCS strategy, the path with the least cumulative cost is chosen. Note that due to the many options in the fringe, the algorithm explores most of them so long as their cost is low, and discards them when a lower-cost path is found; these discarded traversals are not shown below. The actual traversal is shown in blue.

Path: S -> A -> B -> G

Cost: 5

Let C   = cost of solution / vare_epsilon (€) = arcs cost. =C/ €=effective cost.

Advantages:
- UCS is complete only if states are finite and there should be no loop with zero weight.
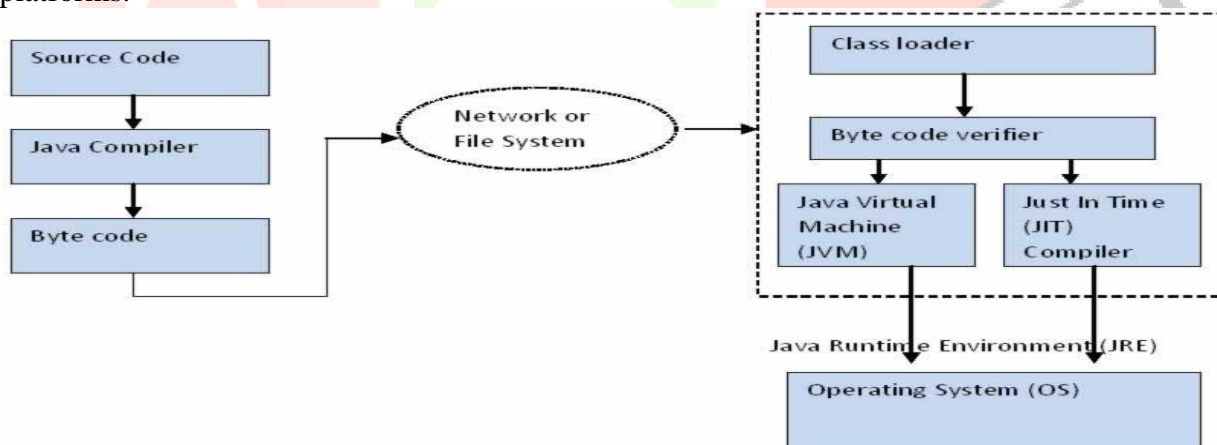- UCS is optimal only if there is no negative cost.

Disadvantages:
- Explores options in every "direction".
- No information on goal location.

ADVANTAGES OF PROPOSED SYSTEM
- Reduction of paper work
- Automation of existing manual information systems.
- Reduction of manual processing
- Keeping track of daily information exchange at the server by the administrator.
- Increase in processing and transfer speeds of information over the network.
- Decrease in processing time

5. IMPLEMENTATION PHASE

Java Virtual Machine (JVM) is unique for each platform. Though JVM is unique for each platform, all interpret the same bytecode and convert it into machine code required for its own platform and this machine code will be directly executed by the machine in which java program runs. This makes Java platform independent and portable. Let's make it clearer with the help of the following diagram. Here the same compiled Java bytecode is interpreted by two different JVMS to make it run in Windows and Linux platforms.

MySQL is a relational database management system (RDBMS) that is free, open-source, and uses various proprietary licenses, including GNU General Public License (GPL). As an RDBMS, MySQL uses SQL to manage data inside a database. It organizes correlated data into one or more data tables, and this correlation helps structure the data .It allows programmers to use SQL to create, modify, and extract data from the relational database. By normalizing data in the rows and columns of the tables, MySQL turns into a scalable yet flexible data storage system with a user-friendly interface that can manage lots of data.[3]

Top 5 Advantages of MySQL

1. Open Source

2. Data Security

3. Scalability on Demand

4. Higher Efficiency

5. Comprehensive Workflow Control

JSP technology is used to create web application just like Servlet technology. It can be thought of as an extension to Servlet because it provides more functionality than servlet such as expression language, JSTL, etc. A JSP page consists of HTML tags and JSP tags. The JSP pages are easier to maintain than Servlet because we can separate designing and development. It provides some additional features such as Expression Language, Custom Tags, etc. [4]

Advantages of JSP over Servlet

There are many advantages of JSP over the Servlet. They are as follows:

i) Extension to Servlet

JSP technology is the extension to Servlet technology. We can use all the features of the Servlet in JSP. In addition to, we can use implicit objects, predefined tags, expression language and Custom tags in JSP, that makes JSP development easy.

ii) Easy to maintain

JSP can be easily managed because we can easily separate our business logic with presentation logic. In Servlet technology, we mix our business logic with the presentation logic.

iii) Fast Development: No need to recompile and redeploy

If JSP page is modified, we don't need to recompile and redeploy the project. The Servlet code needs to be updated and recompiled if we have to change the look and feel of the application.

iv) Less code than Servlet

In JSP, we can use many tags such as action tags, JSTL, custom tags, etc. that reduces the code. Moreover, we can use EL, implicit objects, etc.[5]

Sample coding

```
Admin_addqus.jsp
<%@ include file="include/dbconnect.jsp" %>
<%@page import="java.util.Random"%>
<%@page import="java.sql.ResultSet"%>
<%
String vid=request.getParameter("vid");
String sub=request.getParameter("sub");
String question=request.getParameter("question");
int count=Integer.parseInt(question);
try{
String btn=request.getParameter("Submit");
if(btn.equals("Add")){
String qus=request.getParameter("qus");
String op1=request.getParameter("op1");
String op2=request.getParameter("op2");
String op3=request.getParameter("op3");
String ans=request.getParameter("answer");
String sql="select max(id) as maxid from qus where sub='"+sub+"'";
int id1=0;
ResultSetrs=stmt.executeQuery(sql);
if(rs.next()){
id1=rs.getInt("maxid");}
int id2=id1+1;
out.print(id2);
System.out.print(id2+count);
if(id2<=count){
String qry="insert into qus
values('"+id2+"','"+vid+"','"+sub+"','"+qus+"','"+op1+"','"+op2+"','"+op3+"','"+ans+"')";
int n=stmt.executeUpdate(qry);
esponse.sendRedirect("admin_addqus.jsp?vid="+vid+"&sub="+sub+"&question="+question+"");}
else{
%>
<script language="javascript">
alert("Question Stack Full");
window.location.href="admin_addquestion.jsp";
</script>
<%}}}
catch(Exception e){}
%><%
try{
String bt=request.getParameter("Cancel");
if(bt.equals("Cancel")){
response.sendRedirect("admin_addquestion.jsp");
}}
catch(Exception e){}
%>
Admin_addstudent.jsp
<%@ include file="include/dbconnect.jsp" %>
<%@page import="java.util.Random"%>
<%@page import="java.sql.ResultSet"%>
<%
String it=(String) session.getAttribute("it");
out.print(it);
try{
```

```
String btn=request.getParameter("Submit");
if(btn.equals("Submit")){
String reg=request.getParameter("reg");
String name=request.getParameter("name");
String gender=request.getParameter("gender");
String contact=request.getParameter("contact");
String email=request.getParameter("email");
String address=request.getParameter("address");
String uname=request.getParameter("uname");
String pass=request.getParameter("pass");
String sql="select max(id) as maxid from student";
int id1=0;
ResultSetrs=stmt.executeQuery(sql);
if(rs.next()){
id1=rs.getInt("maxid");}
int id2=id1+1;
Stringins="insert                          into                          student
values('"+id2+"','"+reg+"','"+name+"','"+gender+"','"+contact+"','"+email+"','"+address+"','"+uname+"','"+p
ass+"')";
int n=stmt.executeUpdate(ins);
if(n==1){        %>
<script language="javascript">
alert("Registration Successful");
window.location.href="admin_addstudent.jsp";
</script><% }
else{%>
<script language="javascript">
alert("Registration Failed");
window.location.href="admin_addstudent.jsp"
</script><% }
//out.print(id2);}}
catch(Exception e){ }
%>
```
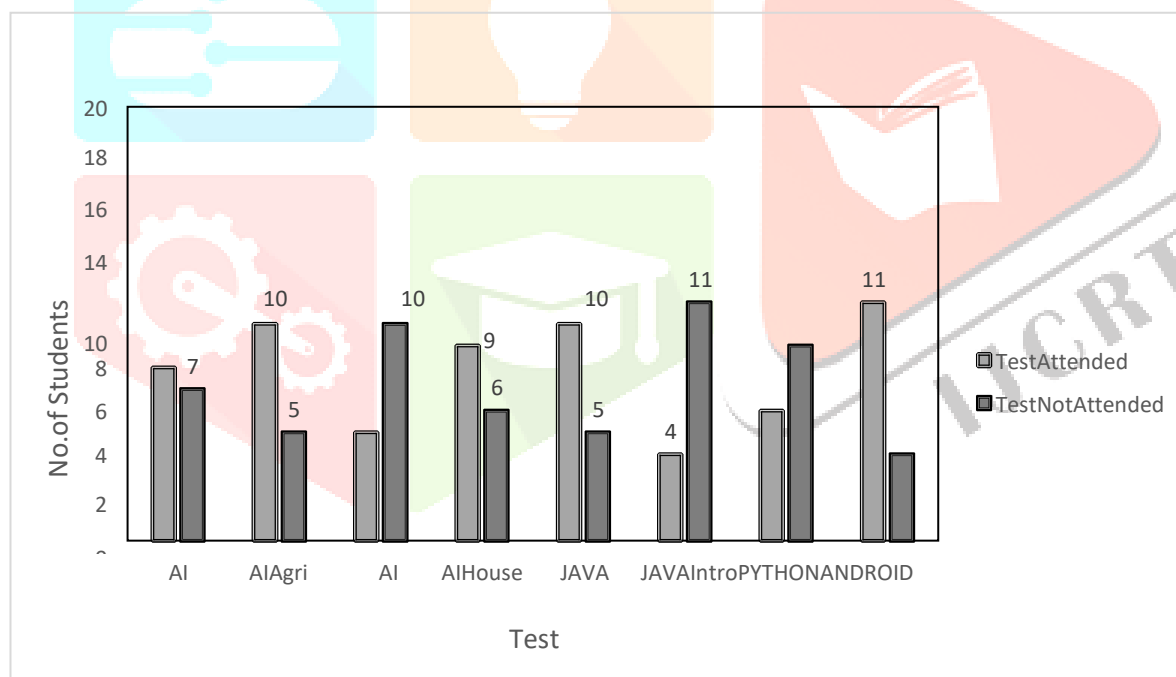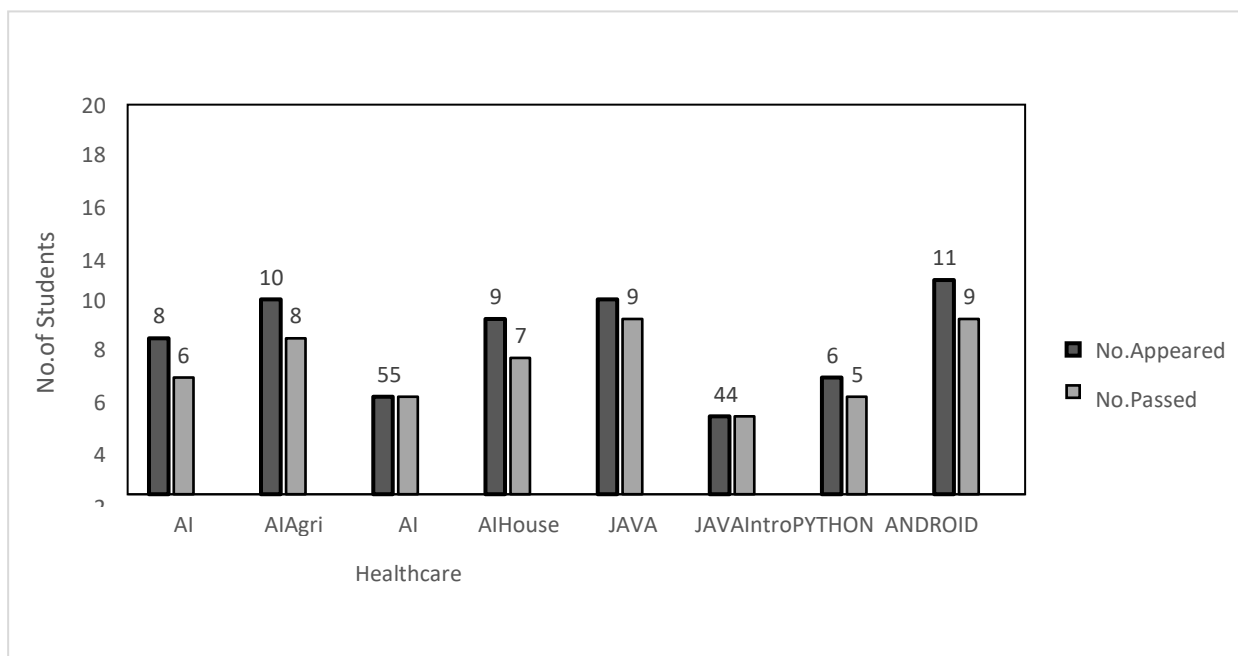
SAMPLE SCREEN SHOTS

6. RESULTS AND OUTPUT ANALYSIS

Subject/No of Students Attended and NotAttended-Tests	AI	AI Agri	AI Healthcare	AI House	JAVA	JAVA Intro	PYTHON	ANDROID
Test Attended	8	10	5	9	10	4	6	11
Test Not attended	7	5	10	6	5	11	9	4

The above graph represents the students attended the test and not attended the test on thesubject. On which Maximum number of students (11) attended the test on Android, and thenMinimum number of students (4) attended the test on Java Intro. At the same time students not attended the test on the subject. On which Maximum number of students (11)not attended the test on Java Intro, and then Minimum number of students(4)not attended the test on Android.

Subject/student Result	AI	AI Agri	AI Healthcare	AI House	JAVA	JAVA Intro	PYTHON	ANDROID
No.Appeared	8	10	5	9	10	4	6	11
No.Passed	6	8	5	7	9	4	5	9

The above graph represents the students appeared and passed in the test on a particular subject. Maximum 11 number of students appeared on the test in Android, out of 11 number of students,9 have passed . At the same time minimum 4 number of students appeared on the test in Java Introduction and out of 4 all the 4 students have passed .In the first graph mentioned the number of students attended and who have not attended the test, and second graph mentioned the number of students passed in the test out of total number of students attended the test.

7.CONCLUSION AND FUTURE ENHANCEMENT

This project entitled as "Artificial Intelligence Based Online Application Development" has been developed to satisfy all the proposed requirement-based application for online examinations is government and private sectors. The artificial intelligence based online application development makes the correction, scoring and tabulating the result for large volumes of the data is made faster and flexible by this approach. More effective conclusions about the performance can be drawn by this artificial intelligence-based searching techniques than manual methods. The system reduces the possibility of errors to a great extent and maintains the data in an efficient manner. User friendliness is the unique feature of this system. The system generates the reports as and when required. The system is highly interactive and flexible for further enhancement. The coding is done in a simplified and easy to understandable manner so that other team trying to enhance the project can do so without facing much difficulty. This project can be enhanced and modifier with large scale data. The documentation will also assist in the process as it has also been carried out in a simplified and concise way.Infuture we can develop this project in android application with extra features like online examination system with student monitoring system. The same project can lead to many mobile based practical applications. Mobile applications with day to day significance can also be tried with these concepts in future.

8.REFERENCES

[1] Costa, E. B., Fonseca, B., Santana, M. A., de Araújo, F. F., & Rego, J.(2017). Evaluating the effectiveness of educational data mining techniques for early prediction of students' academic failure in introductory programming courses. Computers in Human Behavior, 73, 247–256.

[2] Asogwa, O., & Oladugba, A. (2015). Of students academic performance rates using artificial neural networks (ANNs). American Journal of Applied Mathematics and Statistics, 3(4), 151–155.

[3] Ware, Brent. Open source development with LAMP: using Linux, Apache, MySQL and JSP. Addison-Wesley Longman Publishing Co., Inc., 2002.

 [4] Gerken, Till, and Tobias Ratschiller. Web Application Development with JSP. New Riders Publishing, 2000.

[5] Ratschiller, Tobias, and Till Gerken. Web application development with JSP 4.0. New Riders, Publishing, 2000.

[6] https://www.geeksforgeeks.org/search-algorithms-in-ai

WEBSITE REFERENCES
- www.ntu.edu.sg
- www.javaworld.com
- www.edureka.co