MIDWESTERN STATE UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE

CMPS 5153 – Advanced Software Engineering

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USER MANUAL

Project: *Educational Discrete Math Interactive e-Learning Tutorial*

Version: *1.0*

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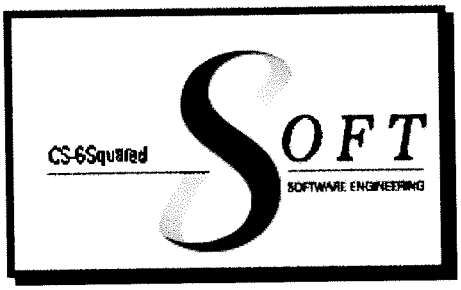

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1.0 INTRODUCTION

Dear Students,

Welcome to the Interactive e-learning system. It is an application that helps the students of computer science major who are taking Discrete Mathematics course. Our project is a stand-alone application that allows the students to interact with the tutorial and also practice on a particular topic. This project is to create a suitable application that is user-friendly, so that students will able to use the application and come to understand the course topics easily. Please read this instruction manual carefully before using the application. This manual will provide you with the necessary information for the correct installation and use of the program. Thank you for choosing a CS-6SQUARED application.

Sincerely,
The CS-6SQUARED Team.

2.0 APPLICATION OVERVIEW

The **Interactive e-learning system** is a creative computer application in the field of Computer Science (CS) and Discrete Mathematics. The application will allow a CS major student to access the Discrete Math tutorial, which aims to guide the student in learning different Discrete Math topics. Each topic is provided with proper explanation which will help to understand properly. A student will able to observe animated, mathematically solved problems. They can observe the problem solving steps to understand the specific topic and also practice them-selves. The application will include additional features, like quizzes and games. The quizzes will have multiple choice questions related to a topic categorized into different levels. They will also able to check their results, such as the total number of questions given in the quiz, number of correct answers, number of incorrect answers and a table of results that would show correctly and incorrectly marked answers.

3.0 SYSTEM REQUIREMENTS

Hardware Requirements:

For the Interactive e-learning System to run properly, make sure you have the following minimum system requirements:

- Compatible PC
- 4 Megabyte of RAM memory
- A hard disk with 5 Megabytes of free disk space
- One mouse
- A CD – Drive, and CD Burner

Software Requirements:

- Windows® 2000, or XP
- Windows® Professional
- Windows vista, NT

4.0 Installation Process for OC4J (Oracle Container for JAVA)

- Check whether the computer is installed with Java Development Kit version J2SDK 1.4.xx.
- If it is not installed or the version is different from 1.4.xx series, then download & install the file **j2sdk-1_4_2_04-windows-i586-p.exe** from the CD we provided.
- Download the file **oc4j_extend_10_g.zip** from the CD and extract all of it in the path C:\ora9i.
- Copy all the folders from the CD that are in \ora9i\... and paste them in the folder created with the name: C:\ora9i
- Download the files oc4j_start.bat and oc4j_stop.bat from the CD and send them into desktop **(see Figure 1).**

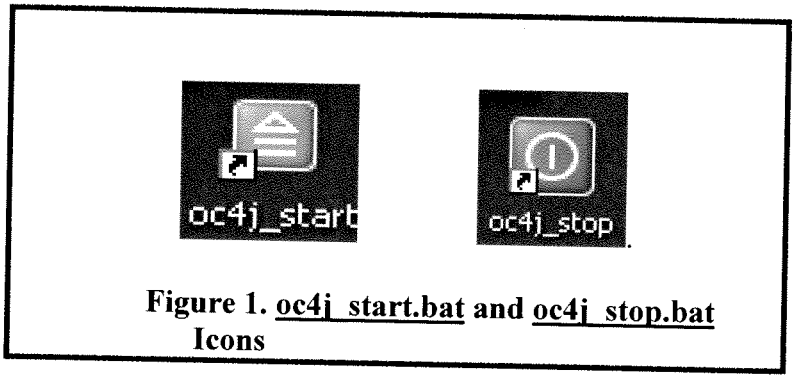

Figure 1. oc4j_start.bat and oc4j_stop.bat Icons

- In order for the browser to work offline oc4j_start.bat should be active. Likewise, to disconnect the browser ocf4j_stop.bat should be used.

- Next, user need to configure the environment variables by clicking: Start > Control Panel > System **(see Figure 2)**.

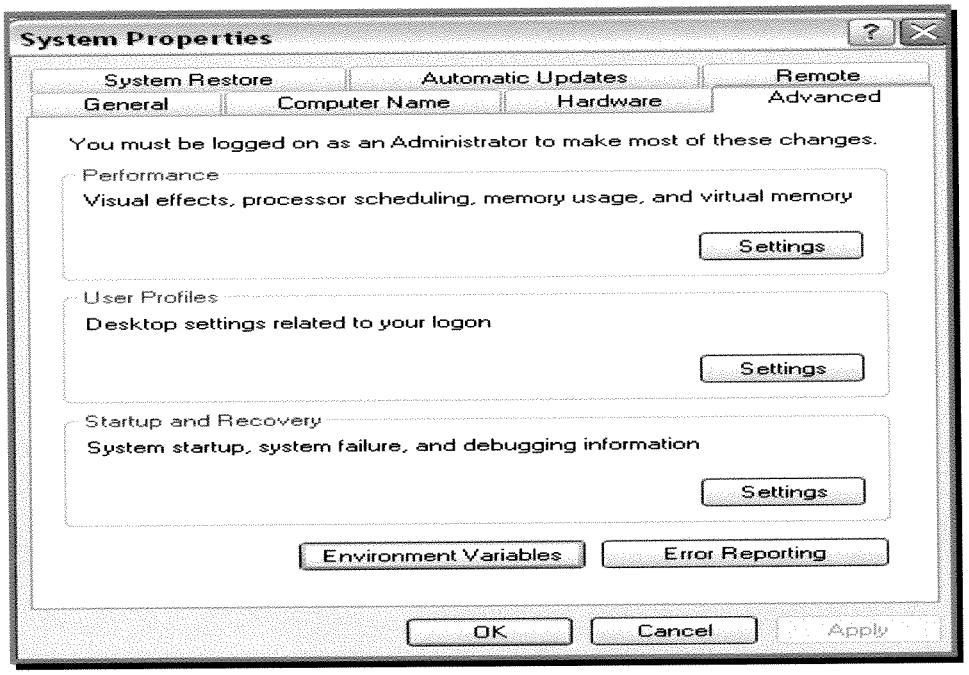

Figure 2. System Properties

- Select Environment Variables button and you see the new window.

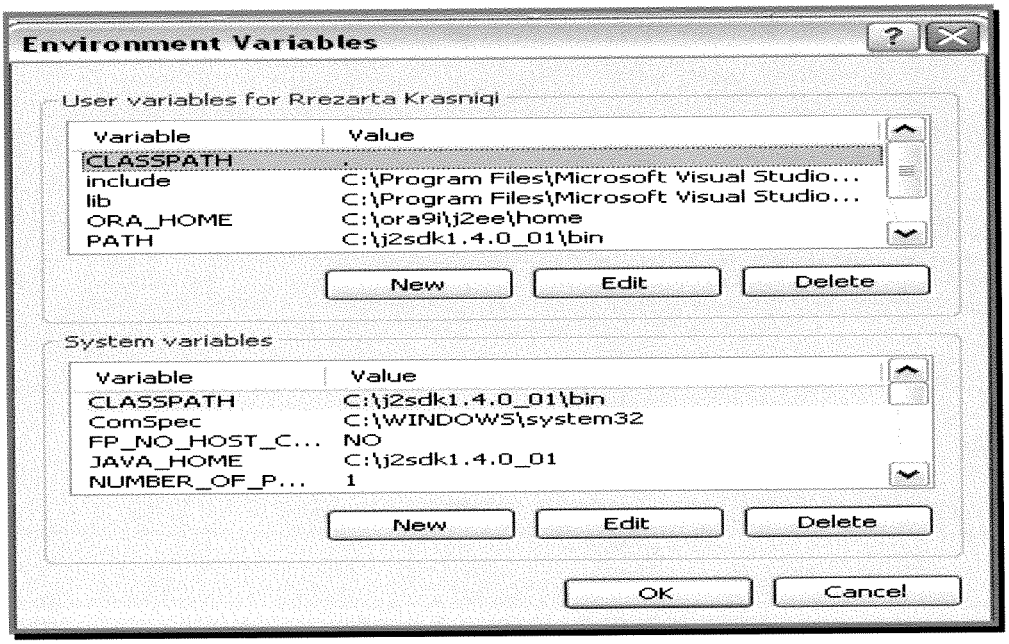

Figure 3. System Environment

- Next, create a user environment variables, ORA_HOME = C:\ora9i\j2ee\home (**see Figure 3**) and
  JAVA_HOME= where Java is installed, for example in this path: C:\ j2sdk1.4.2_04, (**see Figure 2**) for details.

- If user is not connected to the database, the application cannot work. In order to connect to the database, the CD will contain a file: **Connection to Data Base in Access** where you will be able to follow the steps to get the connection with Microsoft Access and other additional detailed information.

5.0 Connection Process for Microsoft Access Database

The CD provided for the user contains **CD:\ora9i\j2ee\home\test_bazat_e_shenimeve** which has the Microsoft access database created as: Discrete **Math Quizzes DB.mdb**. Next the user needs to connect through this database to ODBC and then you can have access to JDBC-ODBC Bridge. The following are the steps that the user needs to follow:

- ***Start -> Settings -> Control panel -> Administrative tools -> Data sources (ODBC)*** and "double click" on Ms Access Database. **(See Figure 4).**

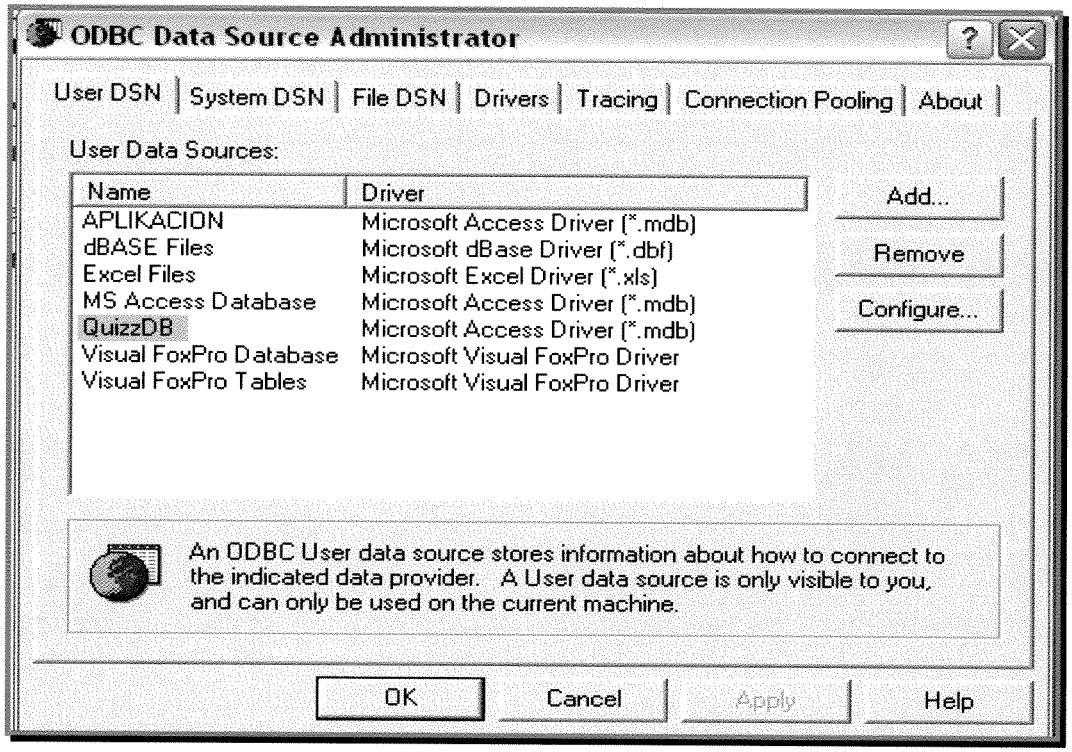

Figure 4. ODBC - Data Source Window

- The new window will pop up for configuration purpose (see Figure5.). In the first field write the data source name as "**QuizzDB**" (don't write other name!) and write "**Connection with Database**" in the description field.

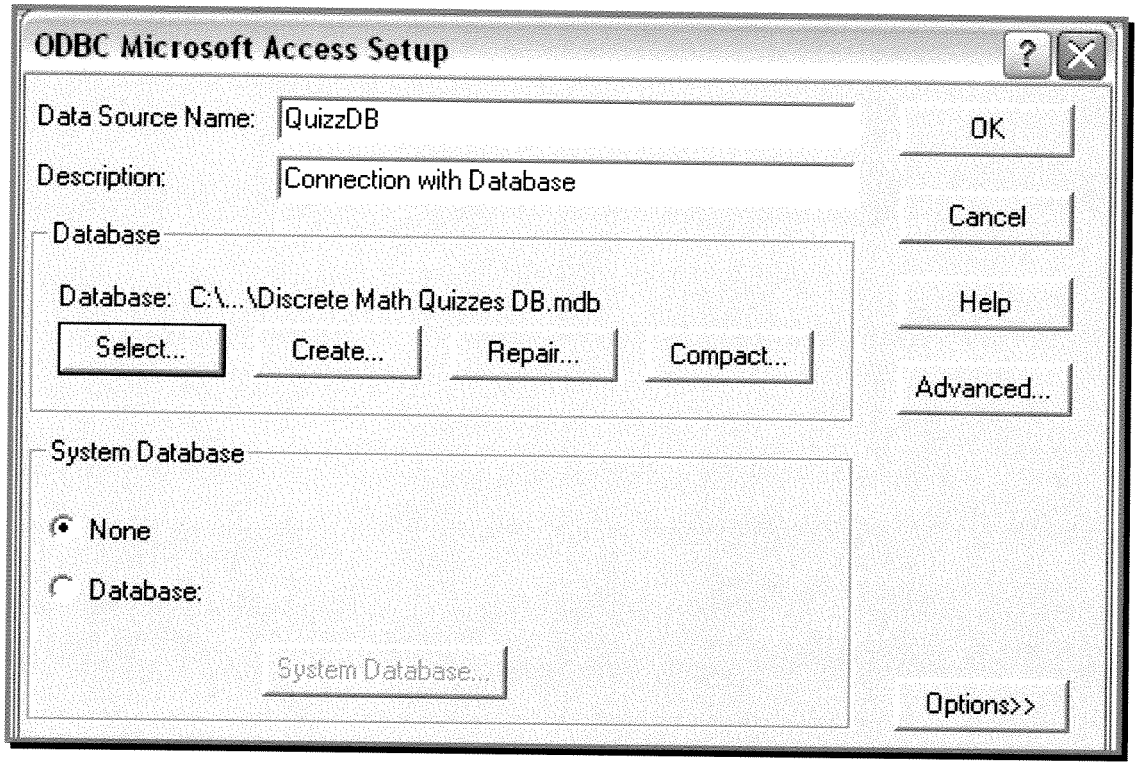

Figure 5. Configuration to Data Base (DB) Window

- Then click on button select (See **Figure 6**).

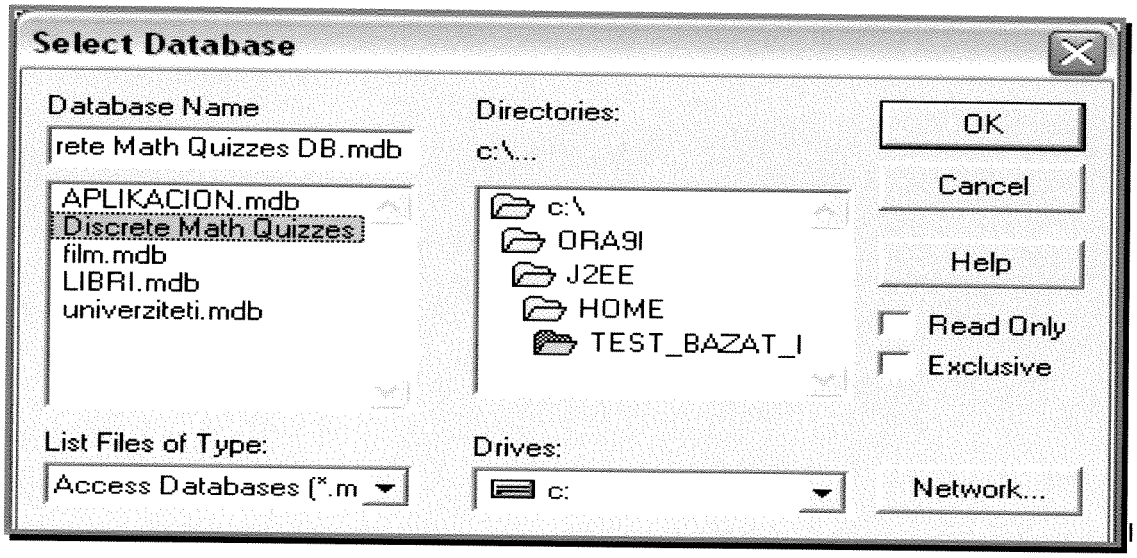

Figure 6. Database Selection Window

- If the user needs to verify that the connection has successfully established with the ODBC then, go back to the ODBC-Data Source window as shown in Figure. 1 and has to follow the same procedure as mentioned above (***Start -> Settings -> Control panel -> Administrative tools -> Data sources (ODBC).*** The following Figure. 7 show the verification process.

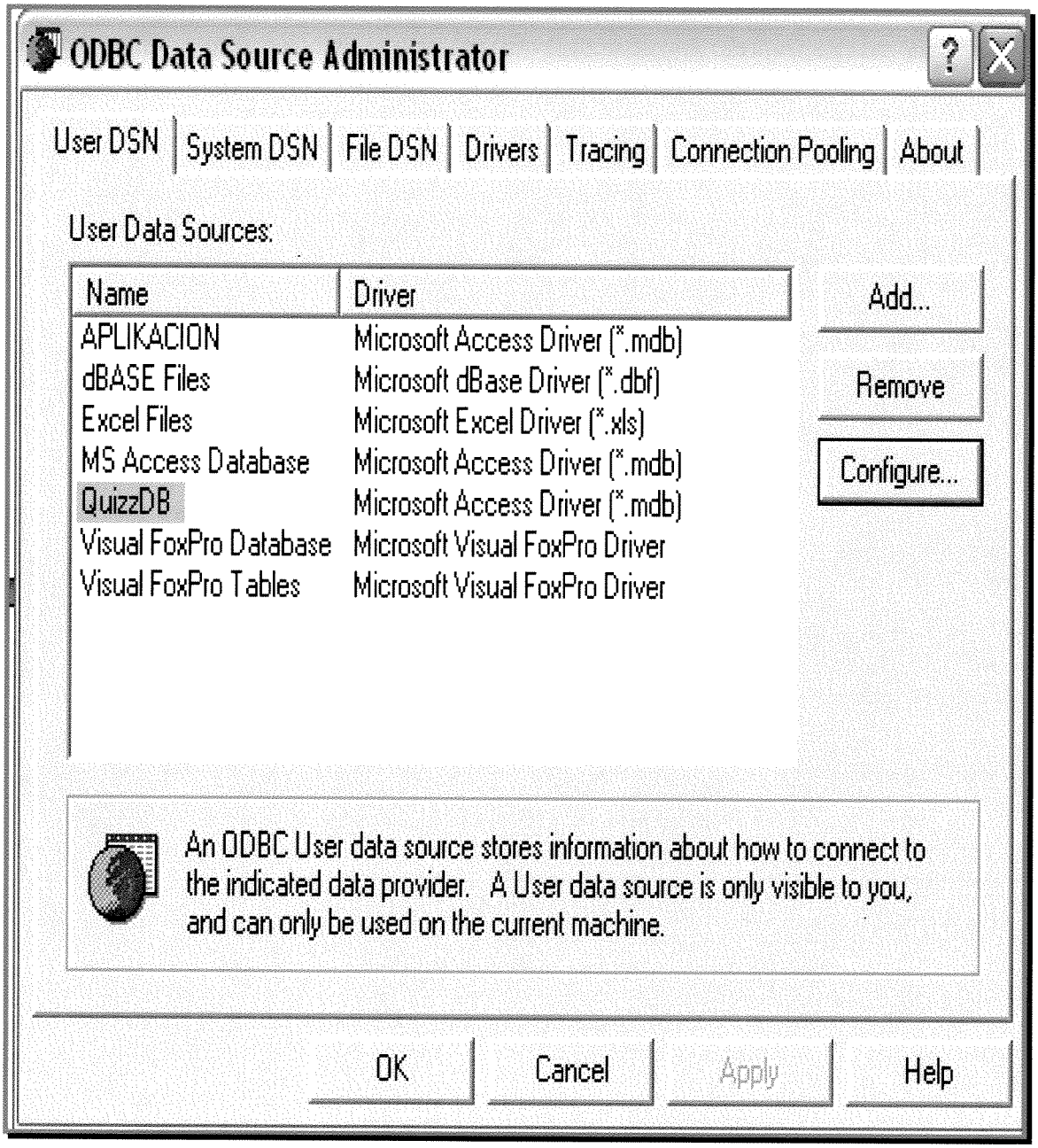

Figure 7. Database QuizzDB exists in the list

6.0 Additional Information to Know

Connection to different databases

Microsoft Access

```
Private Connection connectAccess () throws SQLException, ClassNotFoundException
{
String url = "jdbc:odbc: QuizzDB";
Class.forName("sun.jdbc.odbc.JdbcOdbcDriver");
Connection connection = DriverManager.getConnection(url,"","");
return connection;
}
```

Oracle Database

```
// (local host) ip-adress or host name where DB is located
// (QuizzDB) name of the database
private Connection connectOracle() throws SQLException, ClassNotFoundException
{
String url = "jdbc:oracle:thin:@localhost:1521: QuizzDB";
Class.forName("oracle.jdbc.driver.OracleDriver");
Connection connection = DriverManager.getConnection (url,"username","password");
return connection;
}
```

MySQL Database

```
private Connection connectMySQL () throws SQLException, ClassNotFoundException
{
String url = "jdbc:mysql://localhost/QuizzDB";
Class.forName("org.gjt.mm.mysql.Driver");
connection = DriverManager.getConnection (url,"userName","password");
return connection;
}
```

7.0 GETTING STARTED

This is how you get started. When you enter the url: http://localhost:8888/discrete_math_app/index.jsp the screen appears in the below Figure 9. The screen consists of various links that navigates to a particular page. For example, by clicking on the highlighted link 2 the screen shown in the figure 9 will appear. If user clicks on link number 1 then the control goes to the page as shown in Figure 13. While if the user clicks on the link number 3 then the page shown in the Figure 16 appears.

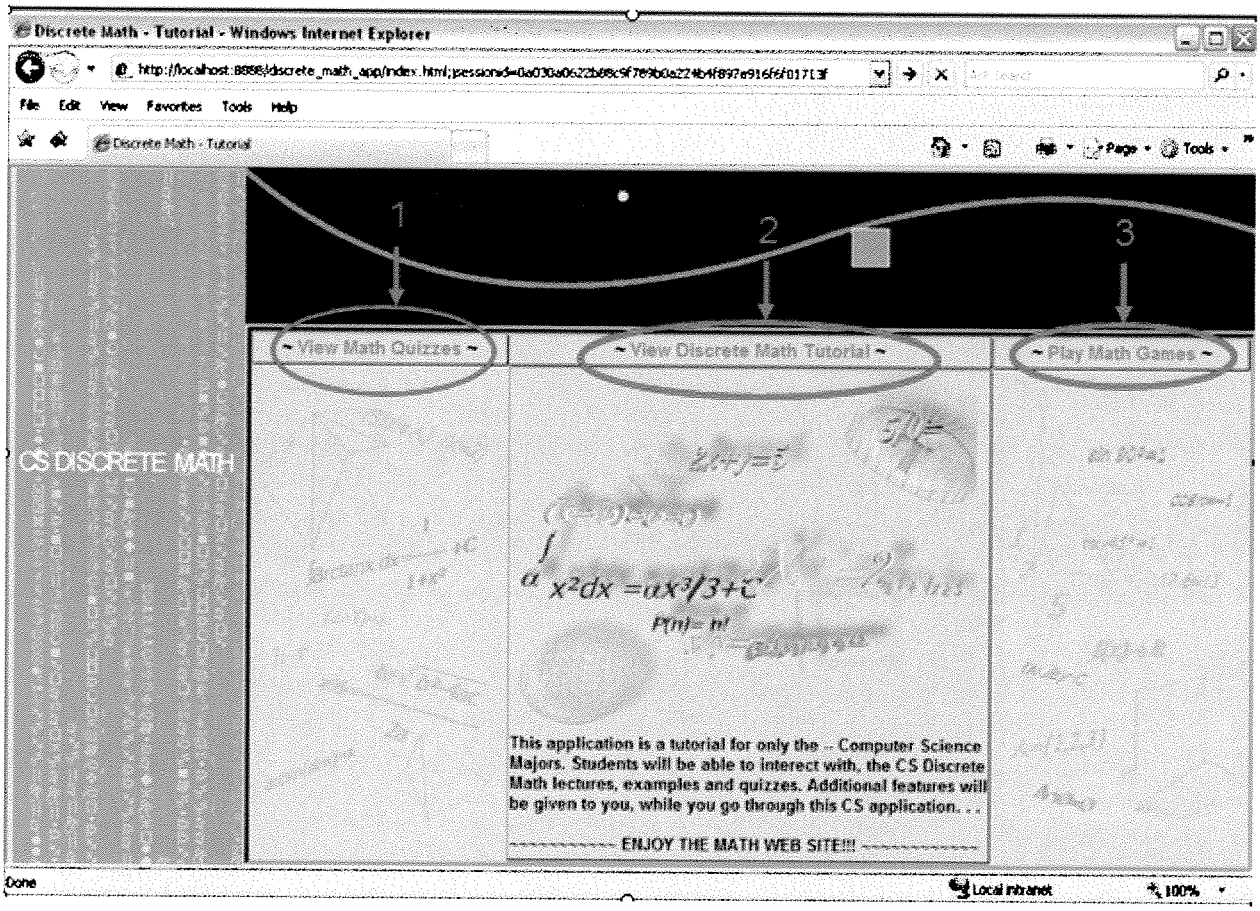

Figure 8. Index Page

TUTORIAL

Once user is in figure 9 he/she can select the topic of choice. By clicking on a particular topic user is directed to the corresponding page where he can get the overview of the selected topic. By clicking on 'view more topics' link user is navigated to the page where he can select the additional topics.

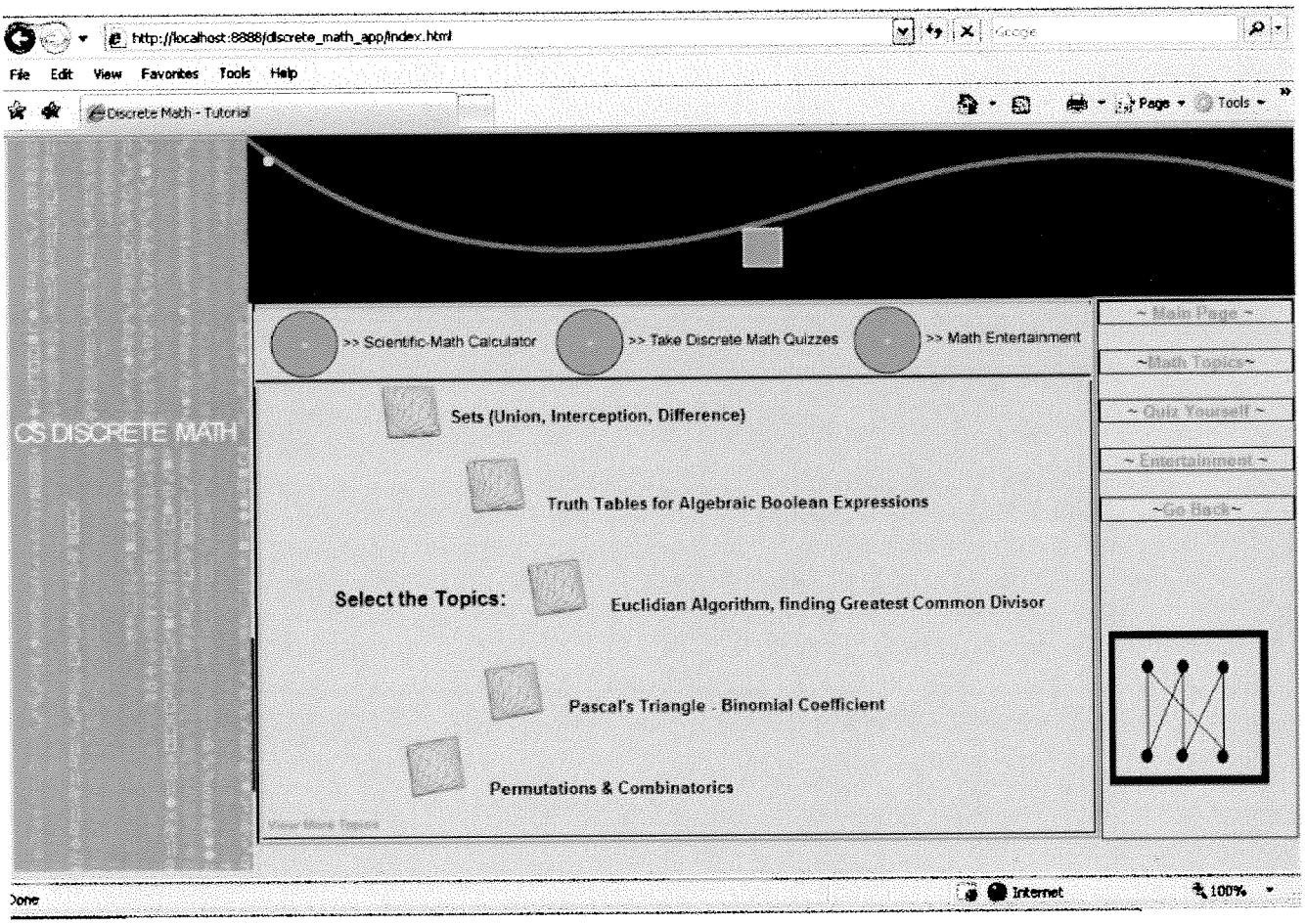

Figure 9. Tutorial Page

For example if the user clicks on the topic Sets (Union, Intersection, Difference) from the above figure 9. Then the page shown in the figure 10 appears. From this page user can navigate to either the quiz page or the main page and even can select the other topics by clicking on the links.

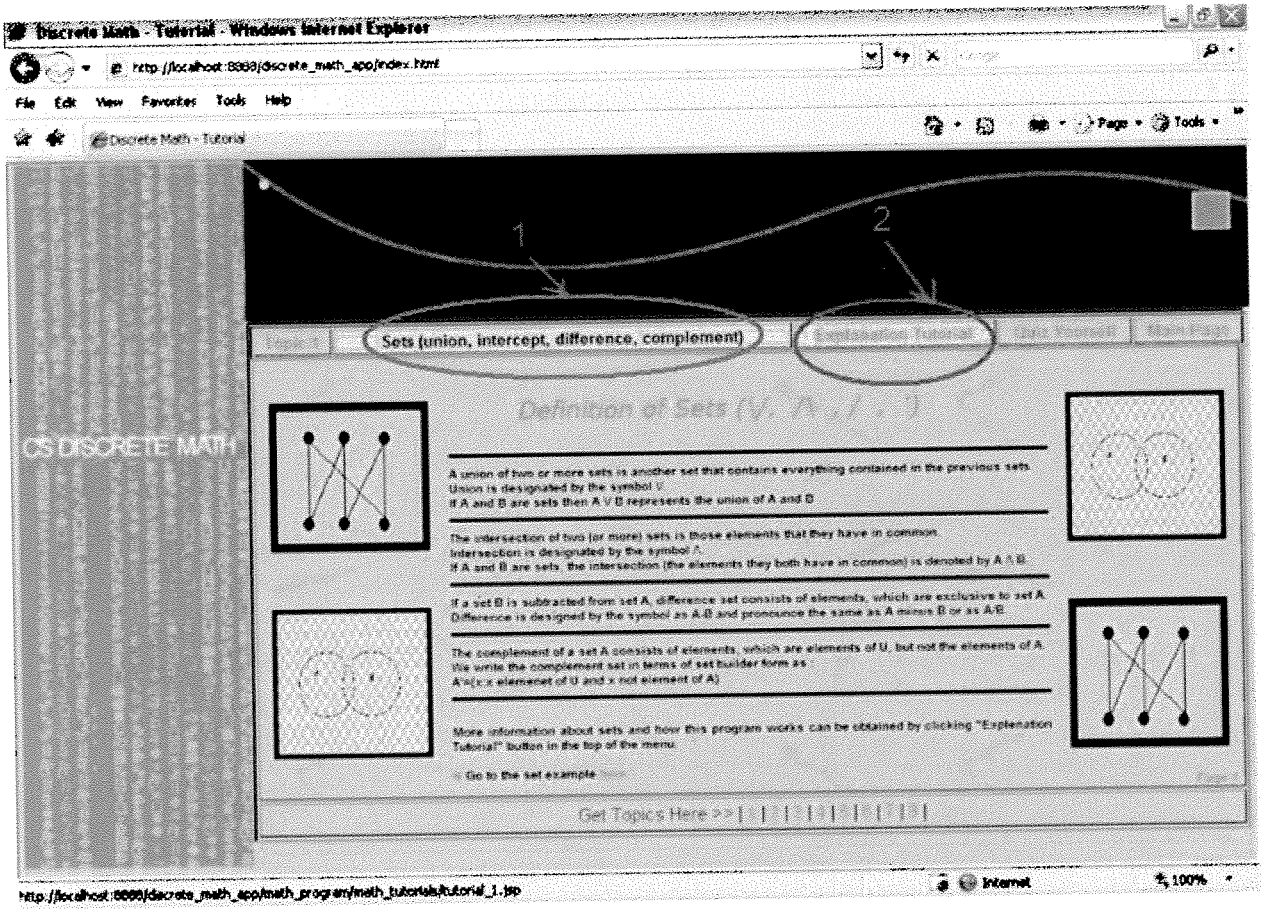

Figure 10. Set overview

When the highlighted link 1 is clicked the control is transferred to the applet where user can interact and learn about the selected topic. This is shown in Figure 11. When the highlighted link 2 is clicked then the control is transferred to the explanation page as shown in figure 12. The user can use the scientific calculator for any computations if needed by clicking on 'Scientific Math calculator' link. User even can go to main page or can take quizzes or can entertain him/her self by selecting the corresponding link.

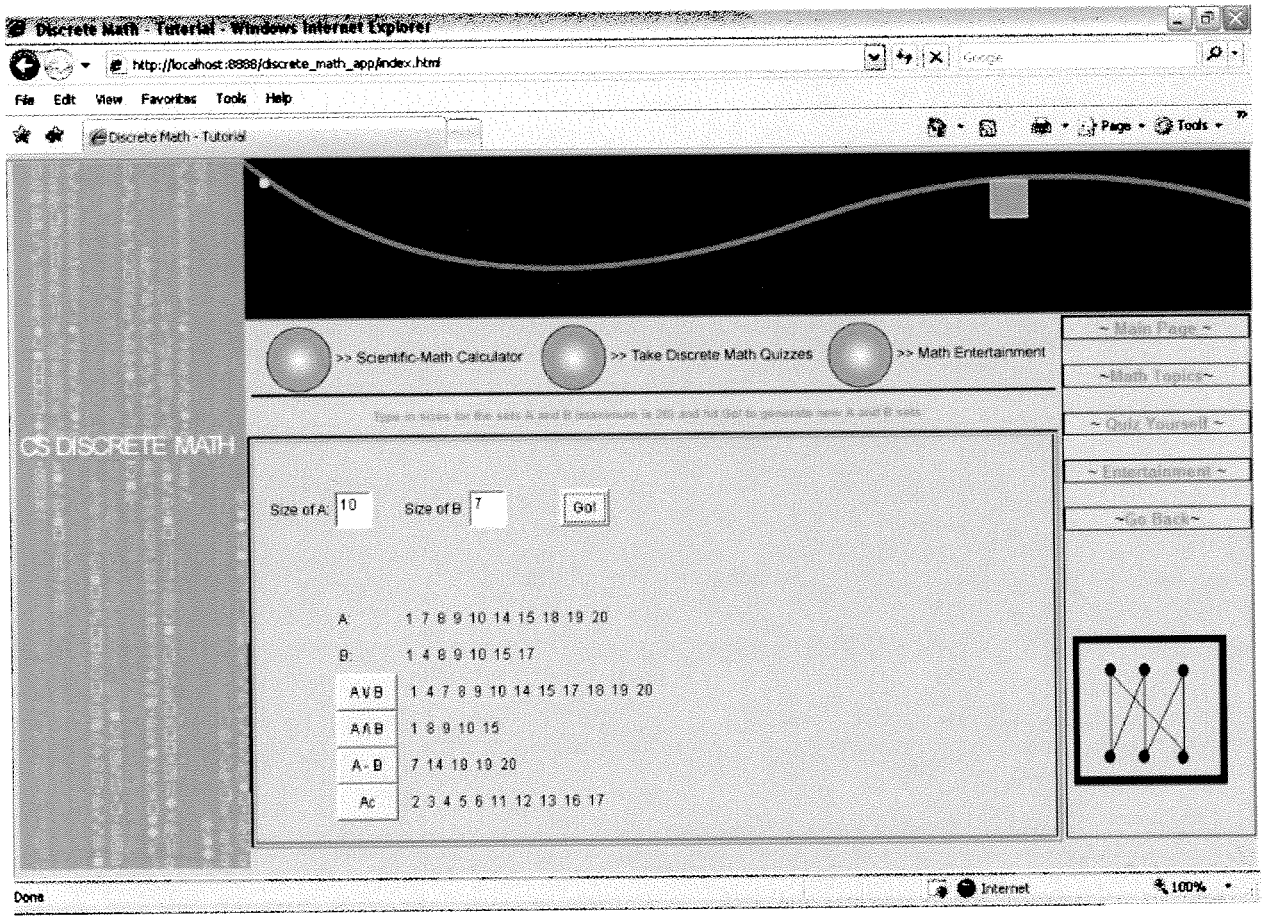

Figure 11. Discrete Math-Tutorial

This figure shows how the applet works. When user enters the value in the fields and clicks on the Go button then the result is displayed below. Unless the values are entered and the Go button is clicked all the other buttons remains disabled.

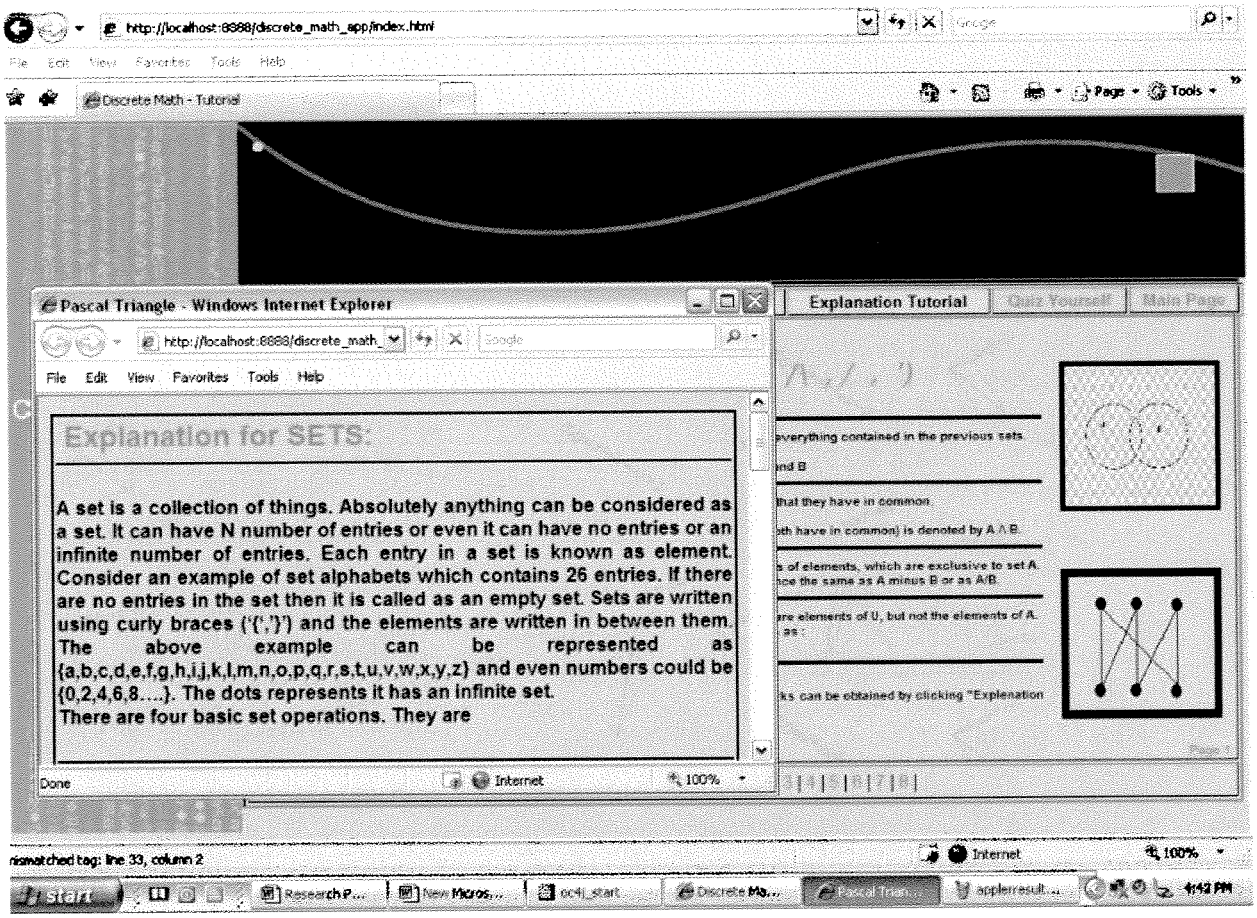

Figure 12. Topic Explanation

This page shows the explanation for the particular topic selected. Referring this page the user can very well understand the topic in detail.

QUIZ

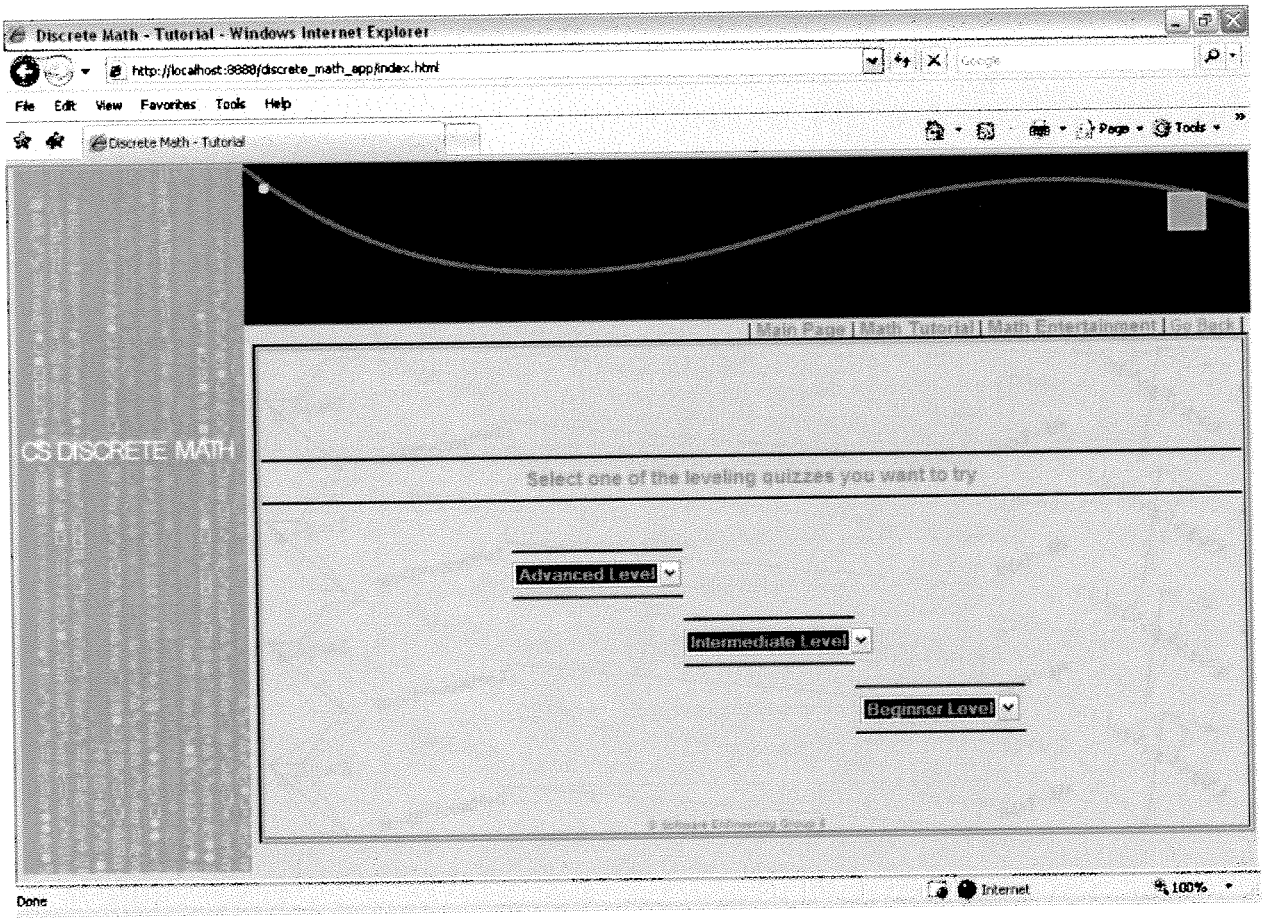

Figure 13. Quiz page

By clicking on link 1 as in Figure 8 the user can take quizzes of different levels. The user is provided with drop down box from which he can select different level as in shown in Figure 14.

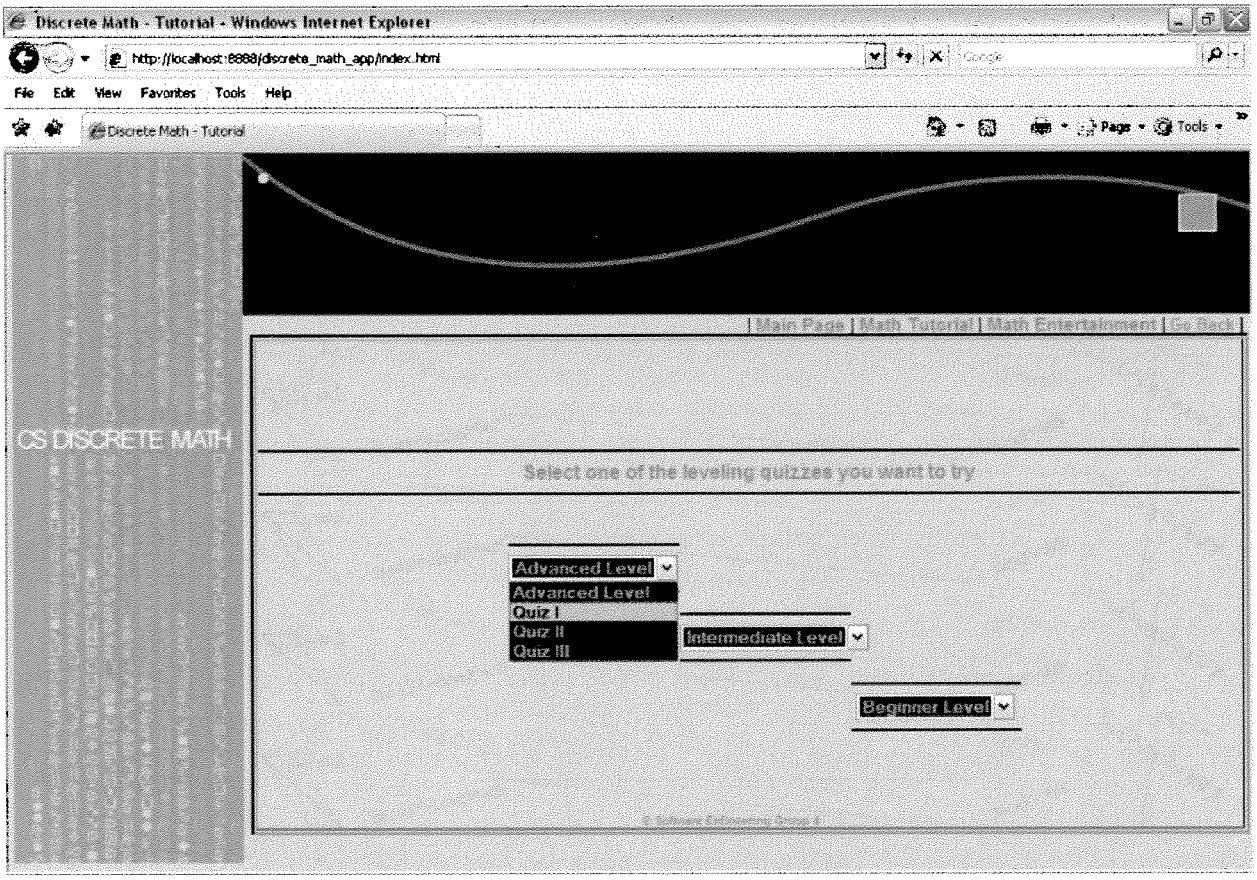

Figure 14. Quiz level page

By clicking on a particular quiz for a given level user will get to the page Take quiz as shown in figure 14 where he can select the topic he wants to take quiz in. To start the quiz user has to click the 'I will score' button located in the centre of the page.

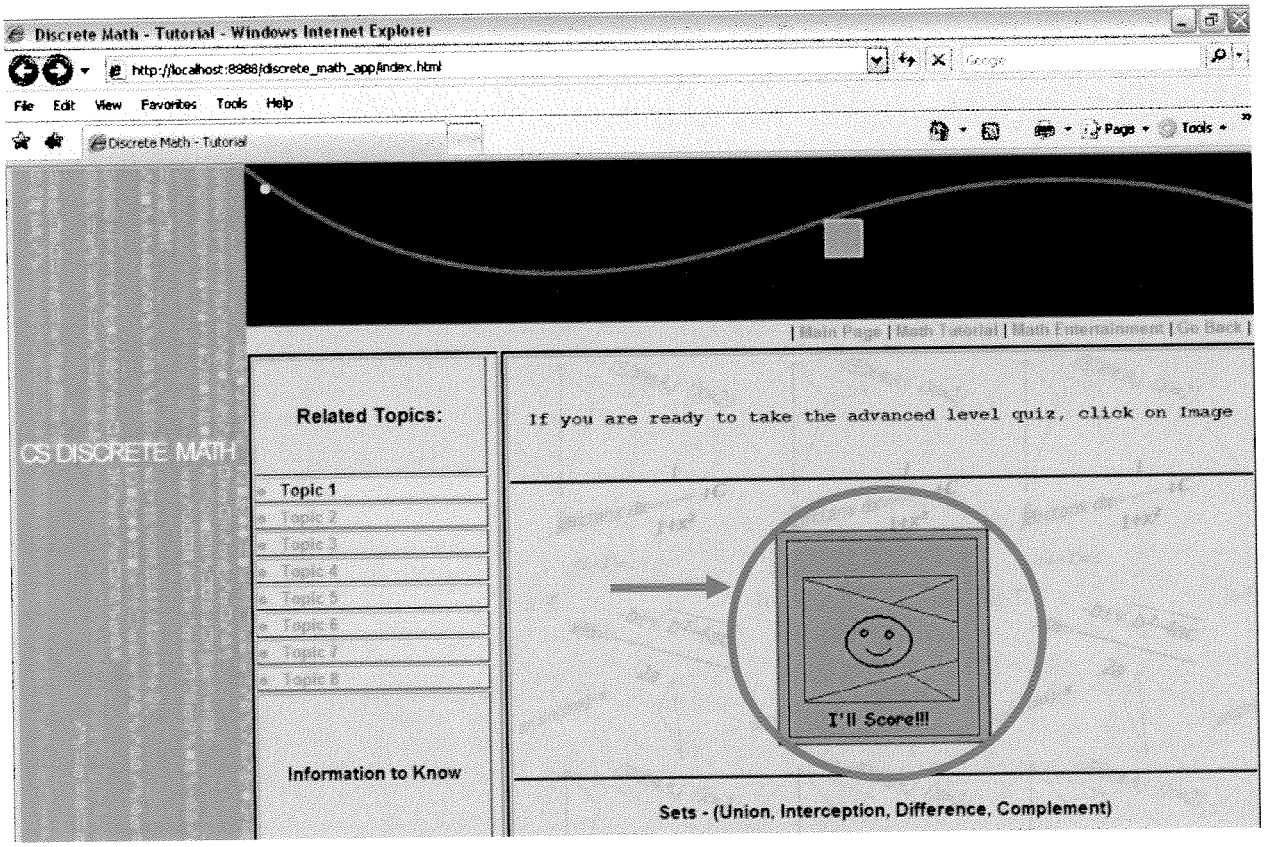

Figure 15. Take quiz page

GAMES

This part provides entertainment to the user. If the user clicks on link 3 from Figure 8 he/she is provided with games home page as shown in Figure 16.

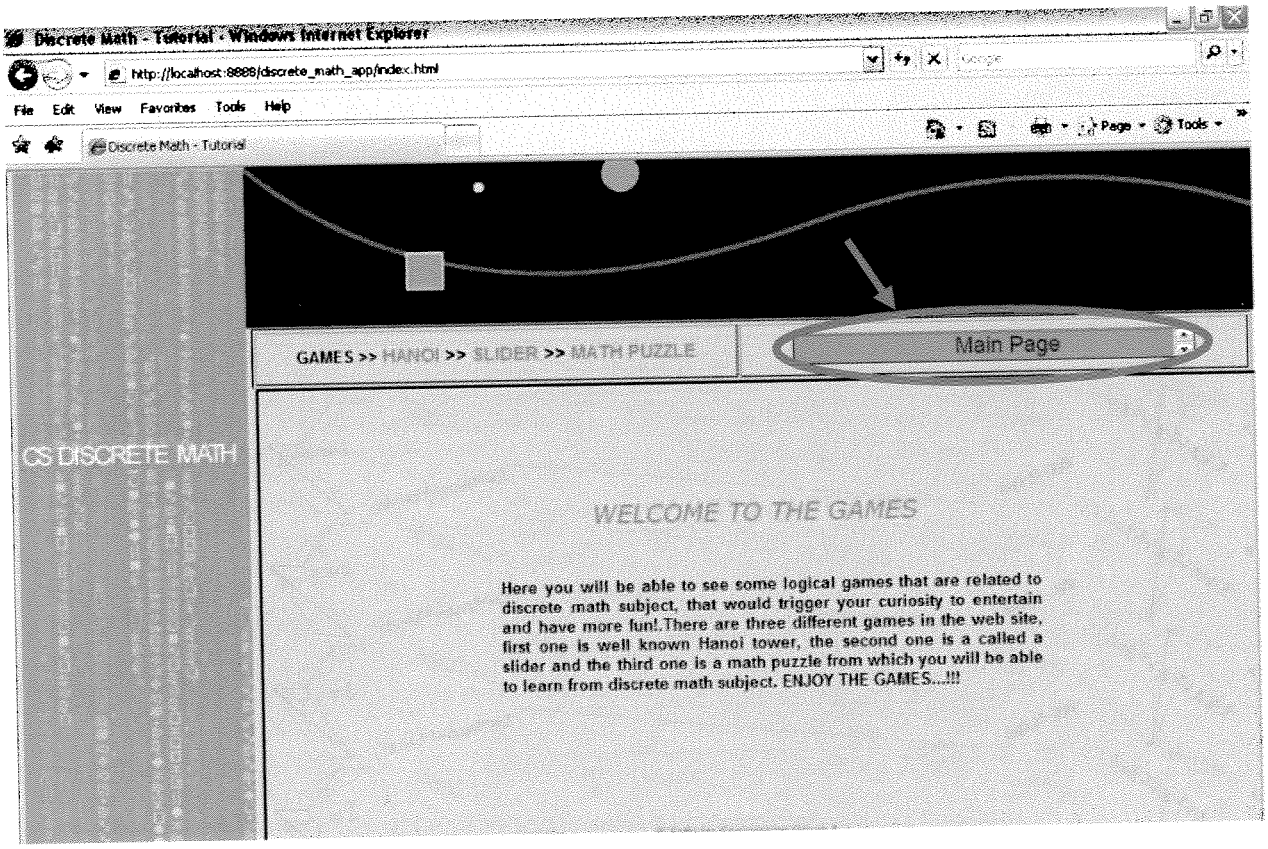

Figure 16. Game page

The user is provided with three types of games namely HANOI, SLIDER and MATH PUZZLE. He/she can select the game by clicking on the particular link and can even navigate to any page required by selecting it from the list box shown in the figure 16.

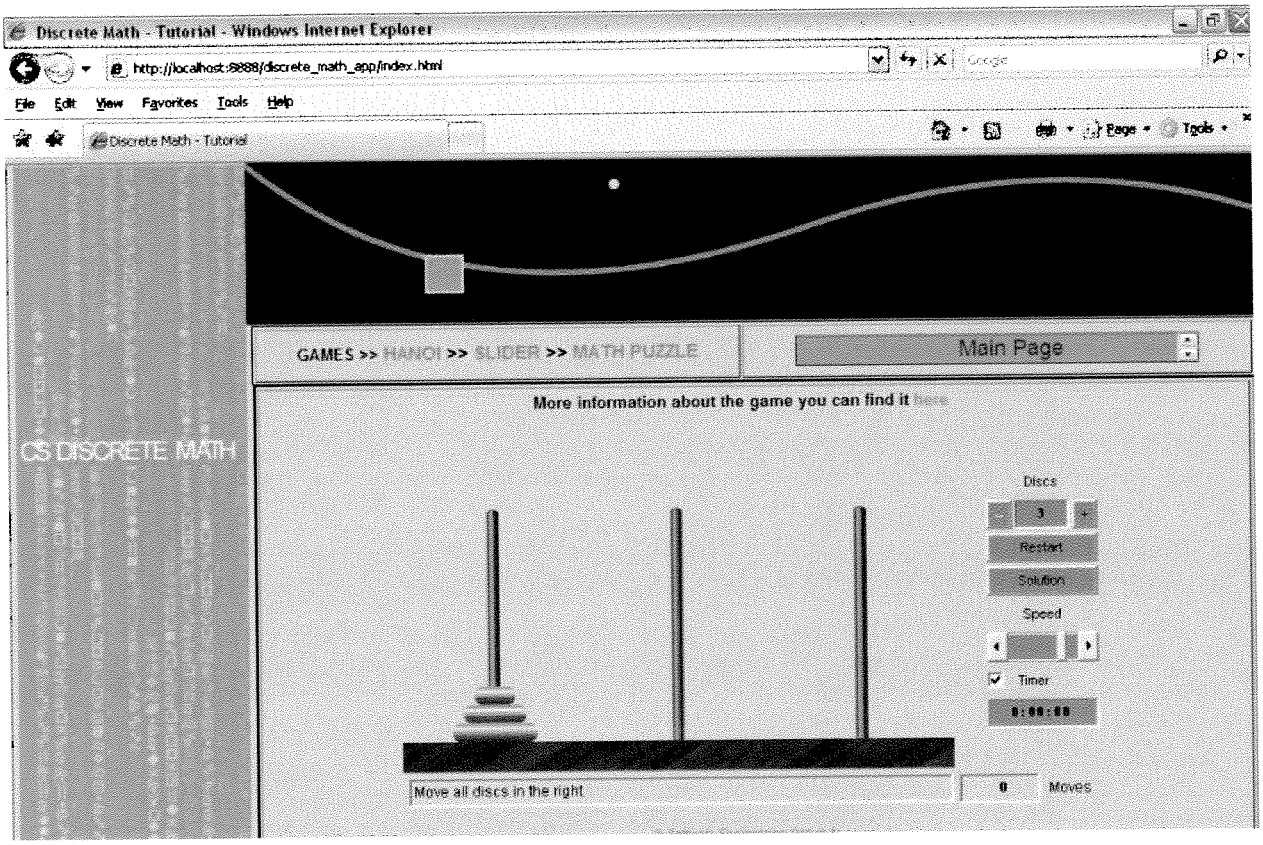

Figure 17. Hanoi Game page

On selecting the HANOI game the page in Figure 17 will be loaded. The user is provided with the text field where he can enter the number disks he/she wishes to move. This process can be done either manually or can run automatically. If the user chooses to do automatically then he has to click on the solution. He can even set the speed and the timer for the disks to move.