SOFTWARE DEPICTING
VIRTUAL CLASS

BY

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And

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A report submitted to

Computer center

PGD

Quaid-e-Azam University Islamabad.

Page No. **1**

QUAID-E-AZAM UNIVERSITY ISLAMABAD

(Department of Computer Center)

FINAL APPROVAL:

This is to certify that we have read the project reported submitted by **SHAGUFTA ALTAF USMANI and AFSHAN ALTAF USMANI.** It is our judgment that this report is sufficient standard to warrant its acceptance by Quaid-e-Azam University, Islamabad, for the PGD.

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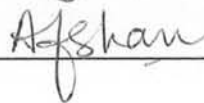   Quaid-e-Azam University, Islamabad.

DECLARATION

I/We declare that this software, neither as a whole nor as a part has been copied from any other source. It is further declared that I/we have completed my/our final project of Post Graduate Diploma in Computer Science/Information Technology successfully as a result of my own struggle and research. No portion of this whole work is presented in this report has been submitted in support of any application for any other degree or qualification of this or any other University or institute of learning. If any part of the project and write up is proved to be copied out or there is any duplication of code then I/we will be responsible for the consequences.

Name of Student(s):

1. Shagufta Altaf Usmani   _____

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PROJECT BRIEF

PROJECT TITLE	VIRTUAL CLASS SYSTEM
ORGANIZATION	COMPUTOR CENTRE QUAID-E-AZAM UNIVERSIY ISLAMABAD.
UNDERTAKEN BY	SHAGUFTA ALTAF USMANI & AFSHAN ALTAF UNSAMANI
SUPERVISED BY	SIR NAZUM-UD-DIN
STARTING MONTH	JULY 2003
COMPLETION MONTH	SEPTEMBER 2003
SOFTWARE USES	MICROSOFT VISUAL BASIC, VERSION 6.0 MICROSOFT ACCESS 2000
SYSTEM USED	PENTIUM III
OPERATING SYSTEM	WINDOWS 98

ACKNOWLEDGEMENTS

First of all thanks to Almighty Allah through whose infinite blessings we have completed the project assigned to us.

We are profoundly grateful to our supervisor, Mr. Nazim-ud-Din without his valuable guidance and help it would not have been possible to complete the project.

We are obliged to our teachers especially Dr. Ghulam Muhammad, Mr. Subban, Mr. Javaid Hussain, Miss Mudassara Arshad, Mr. Sher Muhammad, Mr. Munawwar Taiwana, Mr. Khalid Bashir for their help and contribution to our knowledge as PGD (Computer Science) students.

Finally, we wish to express our gratefulness to our parents. Their encouragements moral support and prayers really helped us in achieving our aspiration.

Most important is that we are grateful to Federal Directorate of Education who provided us the opportunity to study PGD (CS).

ABSTRACT

On going development in multimedia and communications gave the concept of virtual class. Virtual classroom is an environment unlike the traditional classroom. Essentially, the virtual classroom is wherever & whenever you and your computer happen to be. It could be in your room or in a school classroom or in University.

Concept of the project is to develop an application, which like giving lectures, solving problems, taking quiz and tests virtually. Wrapping application (virtual class application in which this application will be embedded) will be handling all activities regarding teachers and students administration and learning etc.

Virtual classroom will allow the user to learn and understand lesson at his/her own pace and place. Do some exercises on their own by using helps and checking their answers they're after. It also provides the facility of services, quizzes on students request or when he/she feels satisfied with the topic. A teacher can conduct a terminal and final test virtual class room will also provide email facility. All these facilities are controlled by the teacher and student can only utilize these facilities in improving his / her self.

System design, development and implementation of virtual class software are discussed briefly in this document, which you are going to study next.

PREFACE

This report is concerned with the development of a virtual class room a product that will provide a teaching environment.

Chapter –1 Contains the introduction of virtual class reasons of project initiation, and the main objectives of the project.

Chapter –2 Explains the existing class room teaching system; need for the virtual class room.

Chapter –3 Discusses the proposed system and requirement analysis of proposed system.

Chapter –4 Provides the detailed proposed system design specification including the design of forms and database design.

Chapter –5 Deals with the system development; Visual Basic the selected language for software development.

Chapter –6 Explains implementation; system conversion; user training; system evaluation and future enhancement.

Chapter –7 consists of comprehensive user guide written to assist the user for utilizing system in a proper way the interface design is also discussed in detail.

CONTENTS

Chapter 5

System Development

1 INTRODUCTION

IN THIS CHAPTER

- ❖ Introduction
- ❖ What is Class room
- ❖ Problem Definition
- ❖ Need for virtual Class room
- ❖ Objectives of the Project

1.1 Introduction

Pakistan needs a large number of experts and specialists in various branches of knowledge and in different fields of scientific and technical disciplines. These persons are required in schools, colleges, universities, institutes and research laboratories, professional and technical departments of government and continually expanding sphere of economic development depends on the availability of large numbers of men of requisite qualification and competence. In order to get these personals and moving forward from developing to developed country, the first and the most important step is to increase literacy rate, not only increase it but also increase the standards of literacy so it is necessary to educate every citizen of Pakistan specially children's. As population is increasing day by day so does number of teachers should also increase. Specially teachers for secondary, higher secondary and university levels are very limited. This becomes a great hurdle in the development of education. This problem can be over come through virtual class.

1.2 What Is Class Room

Class room is an environment where admitted students study. Teachers and students are physically presents in the class, they interact with each other. Teacher delivers and explains lesson to students and they try to understand it, in order to check the understandability of lesson teacher take quizzes and tests. There are two terminal exams and a final examination conducted by the teacher for promotion to next class.

1.3 Problem Definition

The shortage of trained and subject specialist teachers become a great problem for education ministry i.e. it is difficult for them to provide quality education at every part of country. If a large number of schools and colleges are opened even then the deficiency of subject specialist specially in mathematics, all sciences, Arabic etc can not be over come.

At university level first of all it is difficult to open a university in every city of the country secondly the highly qualified facility is not available at every place. Increased development in the field of science and technology makes the whole world a global village. Advancement in information technology however can play a significant role in spreading good quality education to every part of the country. And this is done through virtual class system.

1.4 Need for virtual Classroom

- To provide quality education to every one.
- To provide higher education to the students who for some reasons left their student at primary or secondary levels.
- To provide education to a student at the time which he/she can spare.
- To provide a complete teaching environment to a student.

1.5 Objectives of the Project

The need to provide quality education to every one leads to the development of a software which will fulfill the requirement of skilled teachers.

The major objectives of the project are as follows.

- Auto delivery of lessons
- Drill and solutions for problems and exercises
- Quiz conduction
- Online tests and examine
- Registration of students.

2 EXISTING SYSTEM

IN THIS CHAPTER

- **The existing classroom system**
- **Problems in the existing system**

In order to develop an efficient and well designed system, proper study of existing system as to how it operates and what are its important features must be essentially considered.

2.1 The Existing Classroom System

Students and teachers are physically present in the classroom, teachers gives lesson and explains important points, discuses excurse conduct quizzes and tests for review and assessments. After completion of a course a final exam is taken and student is promoted to next class.

Following activities are normally performed in the traditional classroom.

2.1.1 Lesson Delivery

Teachers deliver lessons in the classroom and explains various important points on black board, also solve some Exercise questions on board.

2.1.2 Class Discussion

Teachers and students interact with each other in class students discuss their problems with teacher.

2.1.3 Topic Reviews/Quizes

After completion of a particular topic teacher conducts a quiz in class for review.

2.1.4 Tests

After the completion of a complete lesson a best is usually taken by the teacher.

2.2 Problems in the Existing System

- Teacher and students must by physically present in the traditional classroom.
- Students have to travel to for of pleas to get quality education.
- It is difficult for those students to space a lot of time for studies who have left school for some seasons.
- Skilled teachers are not available at every place.

3 PROPOSED SYSTEM

IN THIS CHAPTER

- Proposed System
- Requirements Analysis

From the analysis of existing system it is clear that there is a strong need of a virtual clan system that will over come the problems mentioned in the precious chapter.

3.1 Introduction to Proposed System

Fast development in electronic media and communication makes the whole world a global village. Now a days interest access is very easy and cheeps. Nearly overage person can get this facility. So education through this electronic media is very easy. The concept of the project is developed due to easy access for each person and cheaper education at low cost and at suitable time.

The idea of virtual classroom is developed from the concept of distance learning. Virtual classroom is an environment unlike the traditional classroom. Essentially, the virtual classroom is where ever you and your computer happen to be. It could be in your room, in a school class in a village or in the university lab.

The main functions of the proposed system are

- To deliver lesson in the form of slides.
- To give exercises.
- To conduct reviews/quizzes.
- To conduct tests.
- To provide all possible helps .If the topic is not clear to the student then email use may help the student if the system provides could do so.

Virtual classroom will provide approximately all the facilities and teaching environment that a physical classroom can give.

3.2 Requirement Analysis

Before designing any computer based system it is important to analyze the requirements of proposed system. It is vital important to establish the objective that the computer based system should satisfy. So for a successful system, it is important that it satisfies the user requirements.

The following are the objectives of the project.

1. The proposed system should provide quality education to students.
2. The proposed system should have comprehensive notes on the topics to be taught.
3. The system should give exercises to students for their drill.
4. The system should conduct Quizes on the students request.
5. The system should have the students registration facility.
6. The system should conduct online tests and examination of registered students. (This will be in the enhanced version of this system)
7. The system should have discussion facility if online discussion is not possible then E-mail facility could be provided with the system.

4   SYSTEM DESIGN

IN THIS CHAPTER

- System Design Specification
- Form Design
- Data Base Design

Requirement specification provides the developer and customer with the means to access quality once system is built. Thus the finalized requirements becomes the basis of the system design.

4.1 System Design Specification

Design of any software system is of crucial importance. A good software design leads to a successful system development and implementation which fulfill the needs of a customer. On the basis of conclusion drawn from the requirement analysis, software that is proposed for virtual class system is designed using form approach.

- Form Design
- Database Design
- Interface Design

Form design and data base design are discussed here; Interface design will be discussed in user guide.
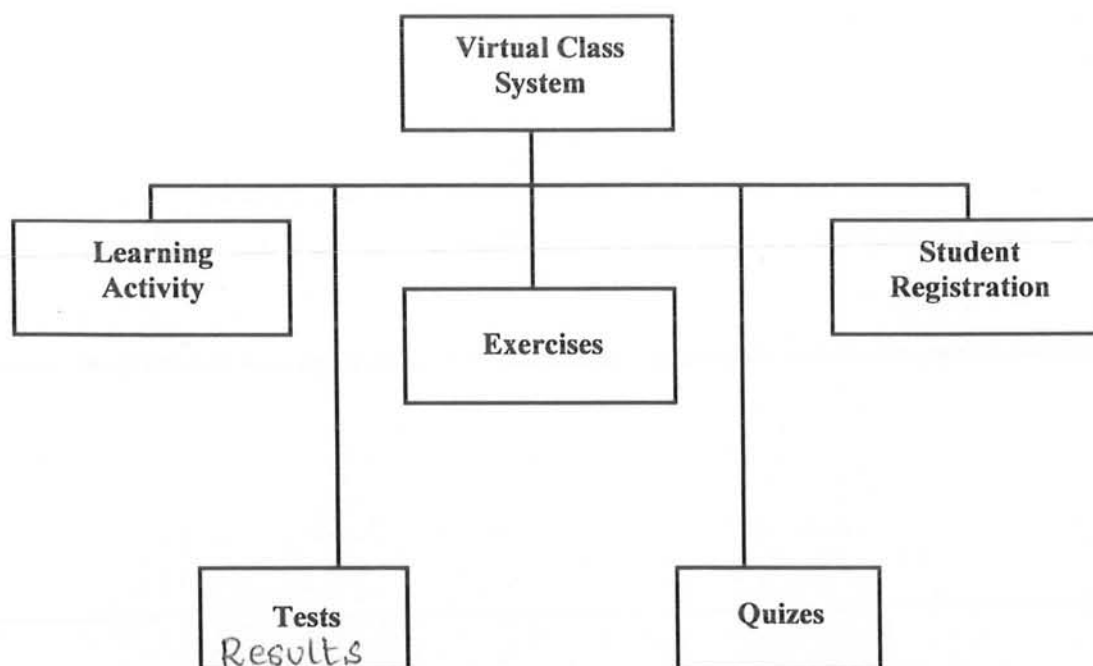
4.2 Form Design

System contains main virtual class form that consists of a number of sub forms. These are integrated to satisfy problems requirements.

Virtual Classroom Forms

- Learning Activity Form
- Exercise Forms
- Quiz Forms
- Test Forms
- Students Registration Form

VIRTUAL CLASS SYSTEM

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                    ┌──────────────┐
                    │ Virtual Class│
                    │   System     │
                    └──────┬───────┘
          ┌────────────────┼──────────────────────┐
  ┌───────┴──────┐   ┌─────┴──────┐      ┌─────────┴────────┐
  │   Learning   │   │            │      │     Student      │
  │   Activity   │   │  Exercises │      │   Registration   │
  └───────┬──────┘   └────────────┘      └──────────────────┘
          │                    │
   ┌──────┴──────┐      ┌──────┴──────┐
   │    Tests    │      │    Quizes   │
   │   Results   │      │             │
   └─────────────┘      └─────────────┘
```

4.2.1 Virtual Class Form

This is the main form satisfying the 1st requirement of the system discussed in the previous chapter. All the sub forms are connected to it .

4.2.1.1. Learning Activity Form

This form satisfies 2nd and 5th requirement of the system discussed in the previous chapter. This is the basic form that retrieves the lessons on various topics and displays its contents.

Student can read and learn the lesson selected, with his own speed of learning and at the time he/she could spare or in the class.

4.2.1.2 Exercise Forms

The requirement numbered as 3 in requirement analysis phase of system is fulfilled by this form mainly it gives exercises to students. It has the following main functions.

- Gives questions to students for their drill
- Gives hints if a student have problem.
- Gives correct solution to the students.

4.2.1.3 Quiz Forms

The requirement numbered as 4 in requirement analysis phase of the system is fulfilled by this form. The main functions are as follows.

- Gives objective questions of any defined type e.g. multiple-choice questions.
- Intimates the student immediately about the correctness of his/her selection.
- Bounds the student to complete his /her quiz in a given period of time.

4.2.1.4 Test Forms

The requirements numbered as 5 and 6 in the requirement analysis phase of the system are fulfilled by this form. The main functions are as follows.

- Give questions mainly objective questions of any defined type e.g. multiple-choice questions.
- Displays the marks obtained at the end of the test automatically.
- The detailed questions and online examination will be in the enhanced version of this system.

4.2.1.5 Students Registration

This satisfies the 7[th] requirement of the requirement analysis phase of the system. If a student wanted to give a test or examination he/she must be registered first.

4.3 Data Base Design

Table Definition

Table Name	:	**Exercises**
Primary Key	:	**Q. No.**
Foreign Key	:	**Lesson No. (Lessons: Lesson No.)**

Column Definition

COLUMN NAME	DATA TYPE	WIDTH	ALLOWNULL	DEFAULT
Chapter No.	Number		No	
Lesson No.	Number		No	
Q No.	Number		No.	
Question	Text	255	No.	

Explanation:

This table will hold the exercises to get the practice of the discussed lessons.

Table Definition

Table Name	:	**Results**
Primary Key	:	**S No.**
Foreign Key	:	**ST_ID(Student info: ST-ID)**

Column Definition

COLUMN NAME	DATA TYPE	WIDTH	ALLOWNULL	DEFAULT
Test No.	Number		No	
Student Id	Number		No	
Student Name	Text	50	No.	
Total Marks	Number		No	
Marks Obtained	Number		No	
Remarks	Text	50	No	

Explanation

This table will hold the information for the lessons taught.

Table Definition

Table Name   :   **Quiz**

Primary Key   :   **S. No.**

Foreign Key   :   **Lesson No. (lessons: lesson No.)**

Column Definition

COLUMN NAME	DATA TYPE	WIDTH	ALLOWNULL	DEFAULT
ST-ID	Number		No	
Lesson No.	Number		No	
S. No.	Number		No.	
Question	Text	255	No.	
Opt1	Text	50	No.	
Opt2	Text	50	No.	
Opt3	Text	50	No.	
Opt 4	Text	50	No.	
Answer	Text	50	No.	

Explanation

This table will hold information relating to the quizzes about lessons.

Table Definition

Table Name	:	**Student Information**
Primary Key	:	**ST-ID**
Foreign Key	:	

Column Definition

COLUMN NAME	DATA TYPE	WIDTH	ALLOWNULL	DEFAULT
ST-ID	Number		No	
S Name	Text	50	No	
F Name	Text	50	No.	
Address	Text	50	No.	

Explanation

This table will hold information about student giving quiz and test.

Table Definition

Table Name	:	**Test**
Primary Key	:	**Test No.**
Foreign Key	:	**Lesson No. (lessons: lesson No.)**
		ST-ID (Student info: ST-ID)
		S No. (Quiz: S No.)

Column Definition

COLUMN NAME	DATA TYPE	WIDTH	ALLOWNULL	DEFAULT
ST-ID	Number		No	
S No.	Number		No.	
Test No.	Auto number		No.	
Question	Text	255	No.	
Opt1	Text	50	No.	
Opt2	Text	50	No.	
Opt3	Text	50	No.	
Opt 4	Text	50	No.	
Answer	Text	50	No.	

Explanation

This table will hold questions for tests

5 SYSTEM DEVELOPMENT

IN THIS CHAPTER

- Tool Selection
- System Testing

The development phase of the project starts after the design during this phase a design in the form of shapes and test is converted into working software. The software is developed in such a way so that it can meet the requirements and specifications of the user. The implementation phase of any system is concerned with the tools used in the development work and the components used to implement the system. This chapter explains all the steps taken for the development of the software.

5.1 Tool Selection

When system comes to implementation level the first thing is to choose appropriate tools for the development of the software. The decision of tool selection is important and crucial. The decision should be wise enough to avoid further difficulties and problems in the later stages of the development life cycle. Therefore, there are two things to be considered.

- Operating system selection
- Programming language selection

5.1.1 Operating System Selection

An operating system should be chosen that fulfils the requirements of the software and is easily available to the user. So Microsoft Windows Operating System has been chosen for this project because Windows provide a graphical user interface which is easier to use.

5. 1.2 Programming Language

The selected programming language is visual basic used to implement the system. The main features of the language are as follows.

5.1.2.1 What is visual Basic

Visual Basic is a high visual language. It is an interpreted and a compiled language. Visual Basic is both a tool and a language. The tool is the Visual Basic Integrated development environment. It provides facilities for writing debugging and running programs in one environment. It is used to develops the Graphical user interface (GUI) of the program. The language is used to write the code that executes behind the GUI of the program. It is now the number one development tool for windows application.

5.1.2.2 Visual Basic Application Architecture

V.B application can manipulates database ranges from a simple desktop database to World Wide Web database.

V.B database application consist of three distinct parts:

- User Interface
- Database Engine
- Data Store

The User Interface:

The user interface contains on-screen forms that display data and permit the user to modify that data. Along with these forms are data modules and classes that contain VB code. These modules and classes are used to perform various database services to do things, like add, delete and modify records.

The Database Engine:

A database such as access consists of tables that hold information, however it has no way to actually manipulate the information.

That is where a database engine comes in. a database engine is the software program that actually manages the information in the database.

Access uses Jet database engine.

Jet-A Specific Database Engine

There are many other database around- but jet is the one that is native to Visual Basic and Access. The jet database engine is sandwiched between our visual basis program and the database files. The Jet. dll files are automatically linked to Visual Basic program at run time.

The records are accessed form the database using Structured Query language (SQL) by using Jet engine our users do not have to have access 7.0 loaded on their PCs. Our programs are self contained. Only the jet and Visual Basic files are distributed in our install program.

The Data Store

The data store is the physical file or files on hard drive. Access .mdb files are native to Visual Basic.

5.1.2.3 V.B Supports Dynamic Linking

When program is written high-level programming languages such as C, Pascal, all of the application's source code files are complied and linked to various libraries. When these function are linked to an application, all of the code become permanent part of applications executable file. This type of linking is called static linking. Static linking places an overhead to memory.

This problem is solved by dynamic linking. Windows introduced the concepts of dynamic linking. This provides a mechanism to link applications to libraries, such as VB data control, at run-time. These libraries reside in their own file. All of the VB .dll file are linked dynamically by windows.

An other advantage of .dll is that when a control gets upgraded, possibly to add more functionality, that single file gets replaced and all of the existing program can use the new file.

5.1.3 Microsoft Access

As mentioned above that Access .mdb files are native to Visual Basic, therefore Access is chosen to store the data of system.

6 SYSTEM IMPLEMENTATION & EVALUATION

IN THIS CHAPTER

- Brief Discussion On Implementation
- System Conversion
- User Training
- System Evaluation
- Future Enhancement In The System

6.1 Implementation

Implementation includes all those activities that take palace to convert from the old system to the new one. The system may be totally new, replacing an existing physical system, or it may be a major modification to an existing system. In either case, proper implementation is essential to provide a reliable system to meet organization requirements.

Developed system will totally alter the way of work, since it is computerized system replacing the physical one. The system is a part of large integrated system, because of deficiency of coordination with the other part of the system, the actual implementation are not possible at that time however some part can be implemented.

6.2 System Conversion

Since no work has yet been done in virtual class teaching therefore, students could not direct easily to it. So simple version with easy installations will be required.

6.3 User Training

System succeed or fail because of the way they are operated and used, even if they are well-designed and elegant. Those who will be associated with or affected by the system must know in detail how they may use the system will or will not do.

The user using this virtual class teaching method are using totally new environment. Therefore a comprehensive user Guide has also be provided to Guide the lesson through the system.

6.4 System Evaluation

System evaluation is the review of software products and related documentation for completeness, correctness, reliability and maintainability. It of course, includes judgment of the software to ensure that the system meets the specifications and requirements for its intended use and performance.

It is really a difficult task to evaluate one's own work. We have tried to develop this software by keeping in view that it should be working correctly.

6.5 Future Enhancements

Due to lack of time and non-awareness with the language i.e. Visual Basic and Access as these were not taught to us in PGD Course we tried our level best to do our job as much better as possible but there is a lot to do in this respect. Following entrancements could be made in this respect.

- The System could be linked to online system and online guidance could be provided.
- Online test system could be done.

7 USER GUIDE

IN THIS CHAPTER

- Graphical User Interface.
- Different Forms

STARTING SCREEN WINDOW
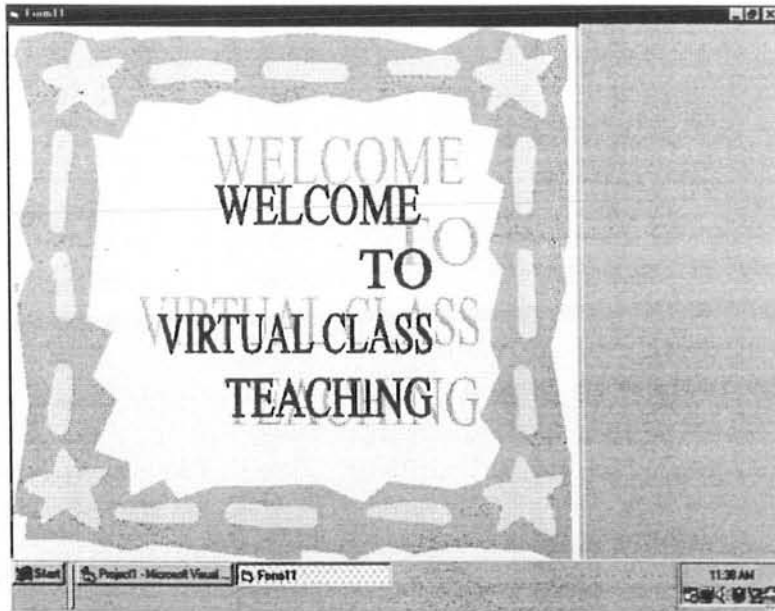
Clicking on the screen will get you inside the virtual class teaching system.

STUDENT INFORMATION · ·

This window is used to store the information about the students using this system. This will help the students to review there performances time by time .

INTRODUCTION

VIRTUAL CLASS TEACHING SYSTEM

This system provides you the following activities.

1- LEARNING: The descriptions of the lessons ares given in detail .This could help in learning and understanding the topics.

2- EXERCISES: Exercises are available for the students to practice the cncepts given in the lessons.

3- QUIZZES: Quizzes are avalaible to provide rapid go through the topics learned.

4- TESTS: Tests are to manipulate the learning level of the students.

| Learning | Exercises | Quizzes | Tests |

This window introduces the user about the system.

Clicking the buttons on the screen will open the gates to different paths of the system.
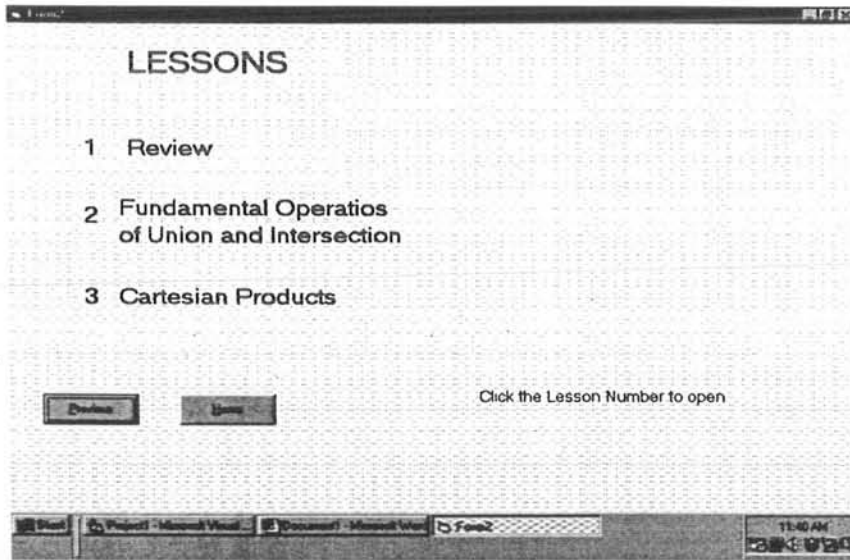
CHAPTERS EXPLORING WINDOW

CHAPTERS

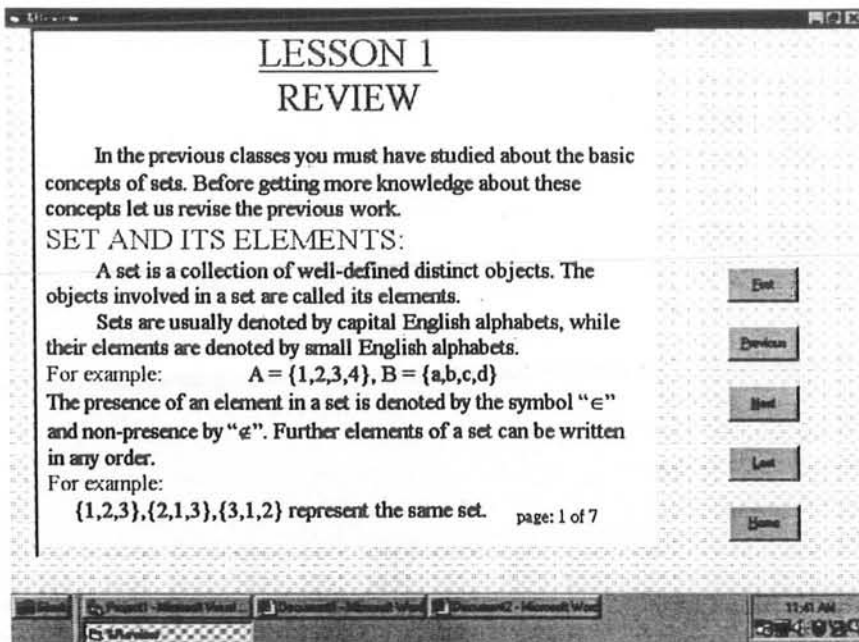| chapter no	chapter name
1	Sets
2	System of Real Numbe
3	Algebraic Expressions.
4	Factorization
5	Fundamental Concepts
6	Demonstrative Geomet

Open   Home

This window displays the chapters in the system. Highlighting the chapter no and then clicking the open button will open the contents of the selected chapters. Clicking the Home button will get you back to the starting window.

CONTENTS OF THE CHAPTER

This window displays the lessons in the chapter selected. Clicking on the lesson number will explore the description of the lesson selected.

LESSON EXPLORING WINDOW

LESSON 1
REVIEW

In the previous classes you must have studied about the basic concepts of sets. Before getting more knowledge about these concepts let us revise the previous work.

SET AND ITS ELEMENTS:

A set is a collection of well-defined distinct objects. The objects involved in a set are called its elements.

Sets are usually denoted by capital English alphabets, while their elements are denoted by small English alphabets.

For example: $A = \{1,2,3,4\}$, $B = \{a,b,c,d\}$

The presence of an element in a set is denoted by the symbol "$\in$" and non-presence by "$\notin$". Further elements of a set can be written in any order.
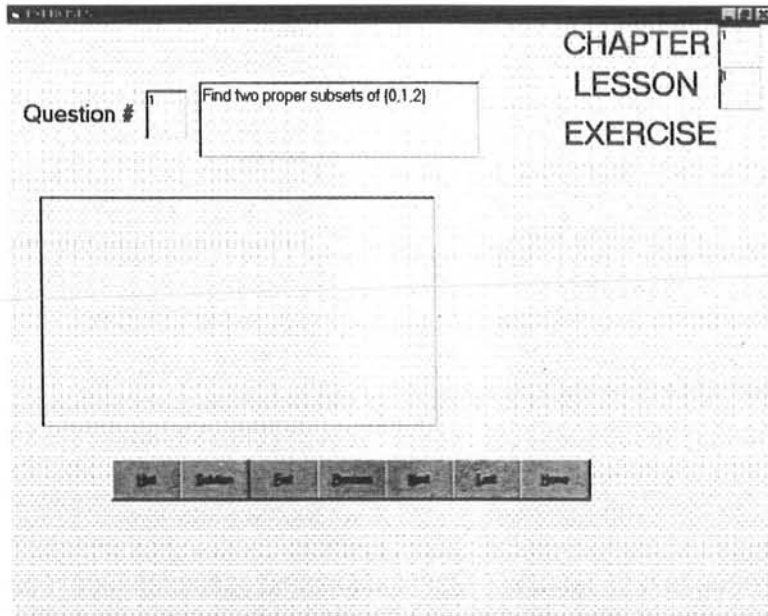
For example:

$\{1,2,3\},\{2,1,3\},\{3,1,2\}$ represent the same set.   page: 1 of 7
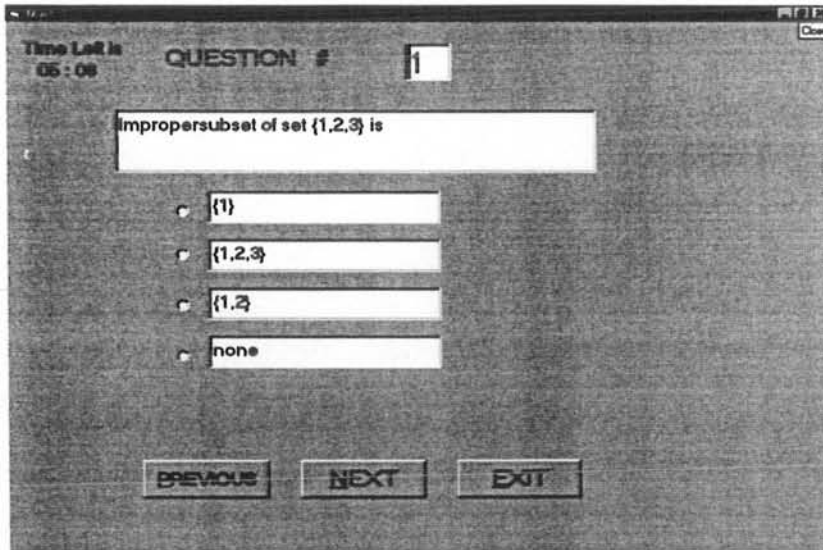
First

Previous

Next

Last

Home

This window will display the descriptions of the selected lessons .The first, previous, next or last buttons will help you to go through different pages of the lessons.

WINDOW DEPICTING EXERCISES

Question # Find two proper subsets of (0,1,2)

CHAPTER
LESSON
EXERCISE

This window displays the questions for exercises. The students could on ther own solve the questions for their practice. If they face any problem than the hints, solutions and answers are also provided to them through this window.

QUIZ WINDOW

This window displays the question for the quiz. This will also check the time taken by the students so that the student can access himself about his performance. Hints of solutions are not provided here but the correctness or incorrectness of the system is checked here.

TEST WINDOW

This window displays the questions for the tests. Result button will display the marks obtained in the tests.

SYSTEM FLOW

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                    ┌──────────────┐
                    │ Introduction │
                    └──────┬───────┘
                           │
┌──────────┐               ▼                    ┌──────────┐
│ Learning │◄──────────                         │ Results  │
└────┬─────┘                                    └────▲─────┘
     │                                               │
     ▼                                          ┌────┴─────┐
┌──────────┐                                    │  Tests   │
│ Chapters │                                    └────▲─────┘
└────┬─────┘                                         │
     │                                          ┌────┴─────┐
     ▼                                          │ Quizzes  │
┌──────────┐                                    └────▲─────┘
│ Lessons  │                                         │
└────┬─────┘                                         │
     │              ┌───────────┐                    │
     └─────────────►│ Exercises │────────────────────┘
                    └───────────┘
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