M4.1-R4: APPLICATION OF .NET TECHNOLOGY

Objective of the Course

The objective of the course is to introduce .NET technology which provides multilanguage environment to develop windows based software development. The focus is on
- .NET Framework
- Programming Language C#
- Visual Basic
- ASP .NET (for web application)

Outline of Course

S. No.	Topic	Minimum number of hours
1.	The .NET framework	3
2.	C# Basics	11
3.	C# Using Libraries	7
4.	Advanced Features Using C#	7
5.	ASP.NET 2.0	7
6.	Introduction to Programming with Visual Basic.NET	7
7.	File and Database Applications	8
8.	Advanced Programming Constructs	5
9.	.NET Architecture and Advanced Tools	5

Lectures	**=**	**60**	
Practical/tutorials	**=**	**60**	
Total	**=**	**120**	

Detailed Syllabus

1.The .NET framework   **03 Hrs.**
Introduction, Common Language Runtime, Common Type System, Common Language Specification, The Base Class Library, The .NET class library Intermediate language, Just-in-Time compilation, garbage collection, Application installation & Assemblies, Web Services, Unified classes.

2. C# Basics   **11 Hrs.**
Introduction, Data Types, Identifiers, variables & constants, C# statements, Object Oriented Concept, Object and Classes, Arrays and Strings, System Collections, Delegates and Events, Indexes Attributes, versioning.

3. C# Using Libraries   **07 Hrs.**
Namespace-System, Input Output, Multi-Threading, Networking and Sockets, Data Handling, Windows Forms, C# in Web application, Error Handling.

4. Advanced Features Using C#   **07 Hrs.**

Web Services, Windows services, messaging, Reflection, COM and C#, localization. Distributed Application in C#, XML and C#, Unsafe Mode, Graphical Device Interface with C#, Case Study (Messenger Application).

5. ASP.NET 2.0   **07 Hrs.**
Features of ASP.NET 2.0, Stages in Web Forms Processing, Introduction to Server Controls, HTML Controls, Validation Controls, User control, Data Binding Controls, Configuration, Personalization, Session State, ADO.NET

VB.NET programming language

6. Introduction to Programming with Visual Basic.NET   **07 Hrs.**
- Basic Concepts and a Simple Application
- Using Variables, Constants, Functions
- Processing Decisions
- Looping Structures and Lists

7. File and Database Applications   **08 Hrs.**
- File Access, Dialog Boxes, Error Handling, Menus
- Connecting to Databases

8. Advanced Programming Constructs   **05 Hrs.**
- Sub Procedures, Function Procedures, Modules
- Arrays, Structures, Collections

9. .NET Architecture and Advanced Tools   **05 Hrs.**
- Object-oriented Programming
- Creating Distributed Web Applications
- XML and ADO.NET
- Graphics, Printing, Reporting

RECOMMENDED BOOKS

MAIN READING

1. Joe Mayo, "C# 3.0 Unleashed: With the .NET Framework 3.5", Pearson Education, 2009.
2. Schildt H, "C#: The Complete Reference", Tata McGrawHill, 2007.
3. Powell R & Weeks R, "C# and The .NET Framework", BPB Publications, 2007.
4. Chappell D, "Understanding .NET", Pearson Education, 2007.

SUPPLEMENTARY READING

1. Balagurusamy E, "Programming with C#", Tata McGrawHill, 2008.
2. Abolrous S A, "Learn C# Includes the C# 3.0 Features", BPB Publications, 2008.
3. Kanetkar Y and Dani Asang, "Test Your C# .Net Skills part I & II", BPB Publications, 2008.
4. Mitchell Scott, "Sams Teach Yourself ASP .NET 2.0 in 24 Hours, Complete Starter kit (with CD)", Pearson Education, 2006.
5. Onion Fritz and Keith Brown, "Essential ASP .NET 2.0", Pearson Education, 2007.

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Model Question Paper

NOTE:

1.	There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions.
2.	**PART ONE** is to be answered in the **TEAR-OFF ANSWER SHEET** only, attached to the question paper, as per the instructions contained therein. **PART ONE** is **NOT** to be answered in the answer book.
3.	Maximum time allotted for **PART ONE** is **ONE HOUR**. Answer book for **PART TWO** will be supplied at the table when the answer sheet for **PART ONE** is returned. However, candidates, who complete **PART ONE** earlier than one hour, can collect the answer book for **PART TWO** immediately after handing over the answer sheet for **PART ONE**.

TOTAL TIME: 3 HOURS

TOTAL MARKS: 100
(PART ONE - 40; PART TWO - 60)

PART ONE
(Answer ALL Questions; each question carries ONE mark)

1. **Each question below gives a multiple choices of answers. Choose the most appropriate one.**

1.1 In C# how do you call a member of a base class from within a derive class
a) There is no way
b) With 'MyBase, keyword
c) With 'base' keyword
d) With 'this' keyword

1.2 The output of following
Byte b1=1
Byte b2=255
Byte tot=b1+b2
Console.writeLine(tot);

a) Runtime Error
b) Compilation Error
c) 256
d) One

1.3 Which of the following operation you can perform on an ADO.NET data set.
a) Synchronized with dataset
b) converted to XML
c) Synchronized with recordset
d) schema form a dataset

1.4 What happens when ypu include a Throw statement in the Catch Block
a) Runtime Error
b) Compilation Error

c) Current Exception is re-thrown
d) Execution is abandoned

1.5 Size of session Id
a) 32 bit long string
b) 32 bit long integer
c) 32 bit long double
d) 32 bit long char

1.6 The Data Base
a) SQL
b) .Net
c) COBOL
e) SQL Server

1.7 Default authentication mode in ASP. Net
a) Window
b) Passport
c) Form
d) Cookies

1.8 If browser don't support client – side cookies what state maintenance approach can be use
a) Client Side
b) Cookie less
c) Server Side
d) Non of Above

1.9 Controls that can be added to a page to validate user input
a) Validation
b) Login
c) Web Parts
d)

1.10 Defines a label for control
a) <text>
b) <label>
c) <legend>
c) <textarea>

2. Each statement below is either TRUE or FALSE. Identify and mark them accordingly in the answer book.

2.1. ASP.Net is a language.
2.2. C# support enumerated data type
2.3. 32 bits is the big data type in .Net.
2.4. System.Array can stor multiple data type .
2.5. Class MyClass : BaseClass is the syntax for inherit in c#
2.6. Java programming language support SOAP.
2.7. It is not possible for any class methods in the system namespace to be user
directly without first creating on object form the class

2.8. XML is case sensitive.
2.9. Label1.text ="Anna Jain" is a valid syntax in VB.Net.
2.10. Word- spacing property user to set the width of the elements.

3.   Match words and phrases in column X with the nearest in meaning in column Y

X	Y
X	**Y**
3.1 Support multiple inheritance using	a) Systm.web.ui.page
3.2 A technique use to stream dat in c#	b) Common Language run time
3.3 Two dimensional array in c#	c) int[,] MyArray
3.4 Session state mode.	d) wading
3.5 XML documentation comment	e) <h3>
3.6 Web forms inherit.	f) Systm.web.ui.page
3.7 CLR	g) serialization
3.8 Protocol	h) ///
3.9 Heading level 3	i) int [][] MyArry
3.10 Embedded in web pages	j) Oracle server
	k) Interface instead
	L) //
	m) ARP
	n) HTML
	o) Scripts

4.   Fill in the blanks in 4.1 to 4.10 below, by choosing appropriate words and phrases given in the list below:

(a) abstract	(b) interface	(c) two	(d) .C#
(e) Zero	(f) .cs	(g) 32	(h) System.int32
(i) common parameter	(j) 19	(k) System.int64	(l) Microsoft.access
(m) delete	(n) &	(o) remove	(p) '\n'
(q) !	(r) 	(s) different parameter	

4.1   A static consturctor can have _____ _____praramter.

4.2   The total no of event in Global.asax file in Asp.Net is ____ ____.

4.3   _____ is the extension of C# programming code.

4.4   _____ ____ is CTS type of int data type in C#.

4.5   Access database connect with data base with ____ ____ provider.

4.6   the function _____ _____ to removes char from the current string in c#

4.7   The tag of HTML _____ ____ to break the line.

4.8   _____ _____ is the bitwise unary operator in c#.

4.9   Overload the method in OOPL using _____ ___.
4.10   The accessibility modifiers are allowed in _____ __ class.

PART TWO
(Answer ANY FOUR questions)

5.
    a. What is the mean by Structure? How is different form Class? Define with example
    b. Can we have private constructor? When can I use them? When should we implement a private constructor?
    c. What's a delegate?

                (5+8+2)

6.

    a. What is .Net Remoting? Define the use of channels.
    b. What is caching? Explain the catching option in Asp. Net.
    c. Define Web Services.

                (5+7+3)

7.   Write short notes (any three) of the following
    a. Garbage Collection
    b. Cookies
    c. XML
    d. ADO.Net
    e. Dataset

                (5+5+5)

8.

    a. Create following function using C#

       i.   To print all prime no between 20 to given no.
      ii.   To find out the HCF of two given no.
    b. What is the meaning of Data Binding?

                (6+4+5)

9.

    a. What is the difference between servers.transfer and response. Redirect.
    b. What is the meaning of URL.
    c. What is the meaning of Web Application.

                (8+4+3)

Assignment 1

C# Programming
1. Write a program to read two strings from the keyboard using readline statements and compare them ignoring the case.
2. Write a program that takes number of lines and displays the pattern as:-
 Example:- If number of lines are 5 then

```
                1
        1   2   1
1       2   3   2   1
        1   2   1
                1
```

3. Write a program to get a number and check whether it is prime or not.
4. Write a program to determine the real roots of the quadratic equation
$ax^2 + bx + c = 0$ (where a != 0) after requesting the values of a, b, and c. Note: The equation has 2, 1, or 0 solutions depending on whether the value of b^2 - 4*a*c is positive, zero, or negative. In the first two cases, the solutions are given by the quadratic formula (-b ± Sqrt(b^2 - 4*a*c))/2*a).
 Test the program with the following sets of coefficients:

a = 1 b = -11 c = 28 Solutions are 4 and 7

a = 1 b = -6   c = 9   Solution is 3

a = 1 b = 4   c = 5   No solution

Assignment 2

C# Programming
1.   Write a program to get the name and marks in three subjects for 100 students, print the number of students having A, B, C grade and fail students as per the following rules:- Total marks is sum of marks in three subjects.

Percentage	Grade
>=80	A
>=60 and <80	B
>=40 and <60	C
otherwise	F

2.   Write a program to get a count and display fibonacci series as
      Enter Count: 10
      Output:-
      Series is
      1 1   2   3   5   8   13   21   34   55
3.   Write a program to get two matrices and multiply them. Make sure that number of columns of first matrix = number of rows of second.
4.   Write a program that counts the number of occurrences of a particular character in a line of text.

Assignment 3

Classes, Objects

1. a) Create a base class, Telephone, and derive a class ElectronicPhone from it. In Telephone, create a protected string member phonetype, and a public method Ring( ) that outputs a text message like this: "Ringing the <phonetype>." In ElectronicPhone, the constructor should set the phonetype to "Digital." In the Run( ) method, call Ring( ) on the ElectronicPhone to test the inheritance.

b) Extend Exercise 1 a to illustrate a polymorphic method. Have the derived class override the Ring( ) method to display a different message.

c) Change the Telephone class to abstract, and make Ring( ) an abstract method. Derive two new classes from Telephone: DigitalPhone and TalkingPhone. Each derived class should set the phonetype, and override the Ring( ) method.

2. Create a class date to hold day, month and year . It should have a constructor to define default values, a method to display date in the format dd/mm/yyyy, another method to get the date and increment the date by one day.

3. Imagine you want to write a (console-based) program for a department store. Each item in this catalog is represented by its Stock number, its name or description, and its price. Based on this, create a class that represents each item. Implement it using Array list.

Assignment 4

Operator Overloading, Delegates and Events

1. Using the class date created in previous assignment, overload operator == to check whether two dates are equal or not.

2. Create a class matrix to store integer data. Overload operators +, - and * to implement matrix addition, subtraction and multiplication respectively.

3. Create a class complex to handle complex numbers. Overload operators +,-,* and = for complex numbers. The complex numbers should be displayed as 4+3i.

4. Create a generic sorting application using delegates.

5. Create an application for a bank to manage accounts and raise an event when a transaction causes the balance to fall below some minimum balance. A low balance happens because of a withdrawal of some amount that reduces the account balance below the minimum required balance. The notification should be automatic, so appropriate action can be taken by some other part of the application without user intervention. [Hint: Use custom delegates and events].

Assignment 5

Exception Handling and Multithreading

1. Write a program that throws an exception of type "array index out of bounds" and then handles it appropriately.

2. Write a program that opens two files and copies the contents of one file to another. It should have an exception to handle non existing file in case of reading first file.

3. Write a program to create and start a thread t1. A write method should be defined to display a string in the console window when the thread starts.

Assignment 6

Namespaces, Windows Application

1 Create a namespace Math that has a class Addition and Multiplication containing methods to handle addition and multiplication of integer array. Write a program to call addition and subtraction as

Math.Addition add1=new Math.Additon()
double x=add1.add(1,3,5,6)
The result should be 15.
2   Write a windows application in C# having two textboxes and a button, validate that the textboxes are not blank. Clicking the button will interchange the textbox values and the button disappears.
3   Write a windows application in C# having a textbox and a button. The textbox should get date of birth of the user and it should display the age of the user.

Assignment 7

Advanced Features in C#

1. Create a windows application and draw shapes as given below. Coordinates for rectangle are 0,0,50,50 and ellipse are 0,50,80,60 (0,50 upper left corner of bounding rectangle that defines the ellipse, 80,60 are width and height respectively).
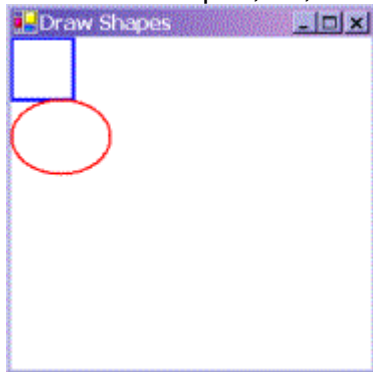
2. Write a program to open an XML file to write or read, and give options: for write-override or append if already exists and in case of read , if the XML file doesn't exist, create new XML file. Use *Xml Text Writer* or *Xml Document.*

Assignment 8

ASP.NET controls

1. Create a web page as:-
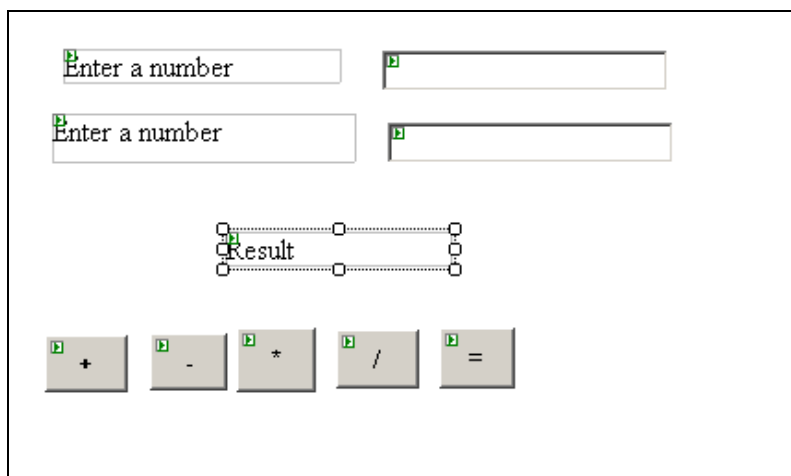
Result should be displayed in the corresponding label.

2.   Create a web page as:-
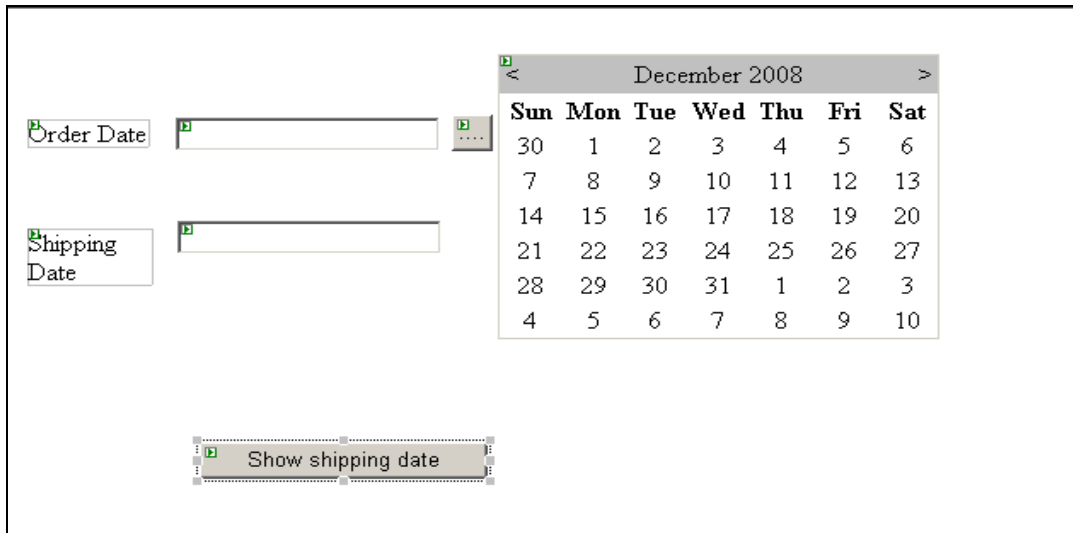
Calendar should be displayed on click of . Shipping Date is calculated as two months ahead of specified order date.

Assignment 9

ASP.NET controls

1. Create a web page as:-
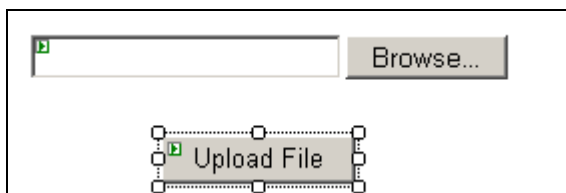
On the click of Upload file , the filename specified in the file upload control should be saved to images folder in the website. It should also check the extension of file specified should be .bmp,.gif,.jpg etc.

2. Create a web page as:-

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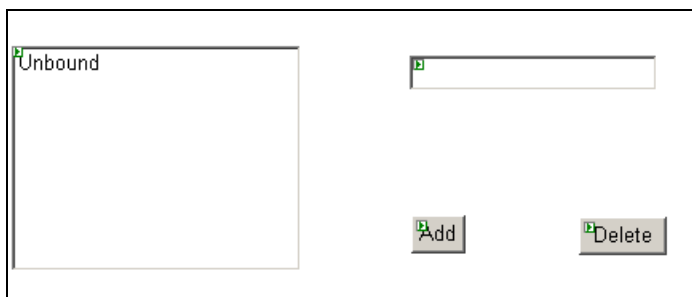
On the click of Add button the text from textbox should be added to listbox and on the click of delete button the item should be removed from the listbox.

Assignment 10

Multiviews, Session State

1. Create a web page as:-
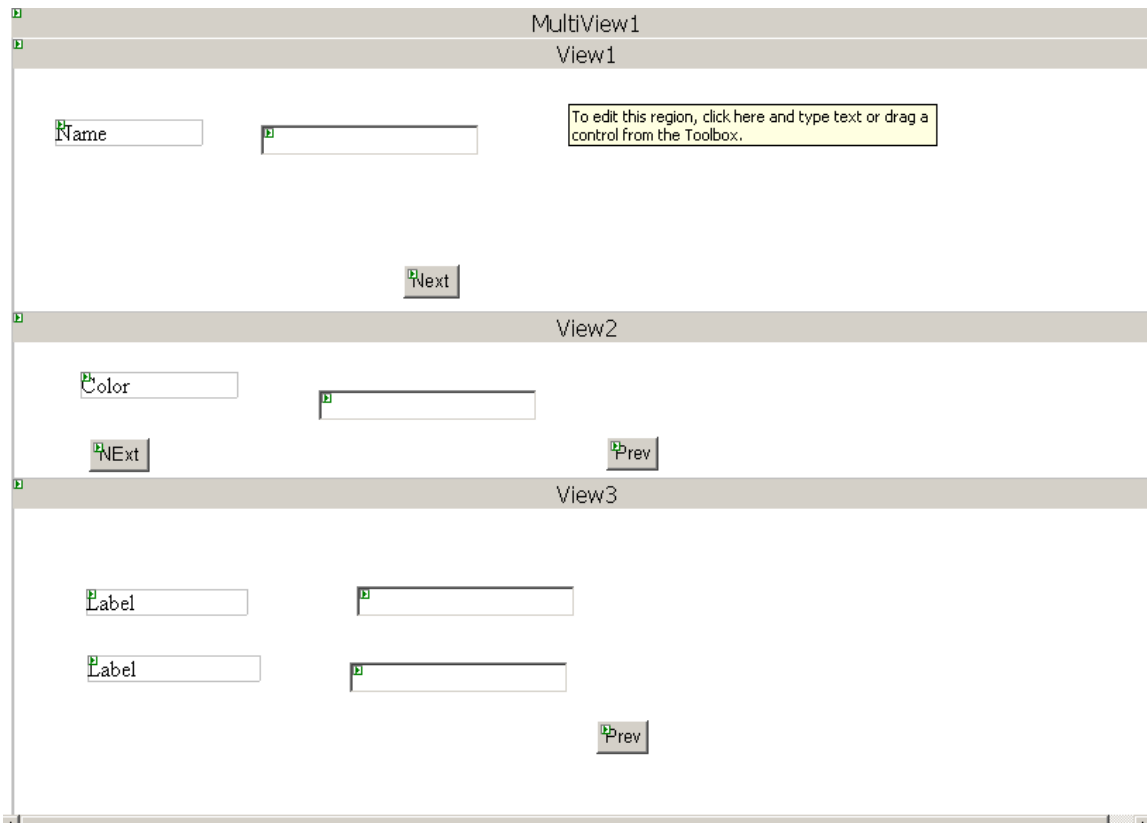
On the click of next button, it should display next view and on the click of previous button, it should display previous view. When we click at next button of view2 it should display value of name and color (from previous views) in view3 .

2. Create a web form as:-

Username and password are both required. On click of remember me next time it should store the password and display it next time the same user tries to login.

Assignment 11

HTML Controls

1. Using HTML table control, generate the following output. It should take number of rows and columns from the user and display the table as shown below.

2. Using Html checkbox control, create a following page:-

What color do you prefer?

☑ Red

☐ Blue

Output:-
You prefer red!
3. Using HTML image control, create a following page:-

Images available should be smiley, angry and stickman. User selects the image and on click of display image, corresponding image should be displayed.

Assignment 12

Validation Controls

Create a web form with given validations:-

Hint Question should have a predefined list of questions as Pet's name, School Name, Your middle name etc.

Assignment 13

Database handling

1. Given table course to store courseno, coursename,fees, duration and timings. Create a datagrid to edit, delete and select a course.
2. Create a table class to store rollno,name, marks1,marks2,total and grade. Then make a web form to do the following:-

Roll No

Name

Marks1

Marks2

Total

Grade

| Insert Record | Delete record | Modify Record |

Save

While adding a record, total and garde should be automatically displayed as Total marks is sum of marks in two subjects.

Percentage	Grade
>=80	A
>=60 and <80	B
>=40 and <60	C
otherwise	F
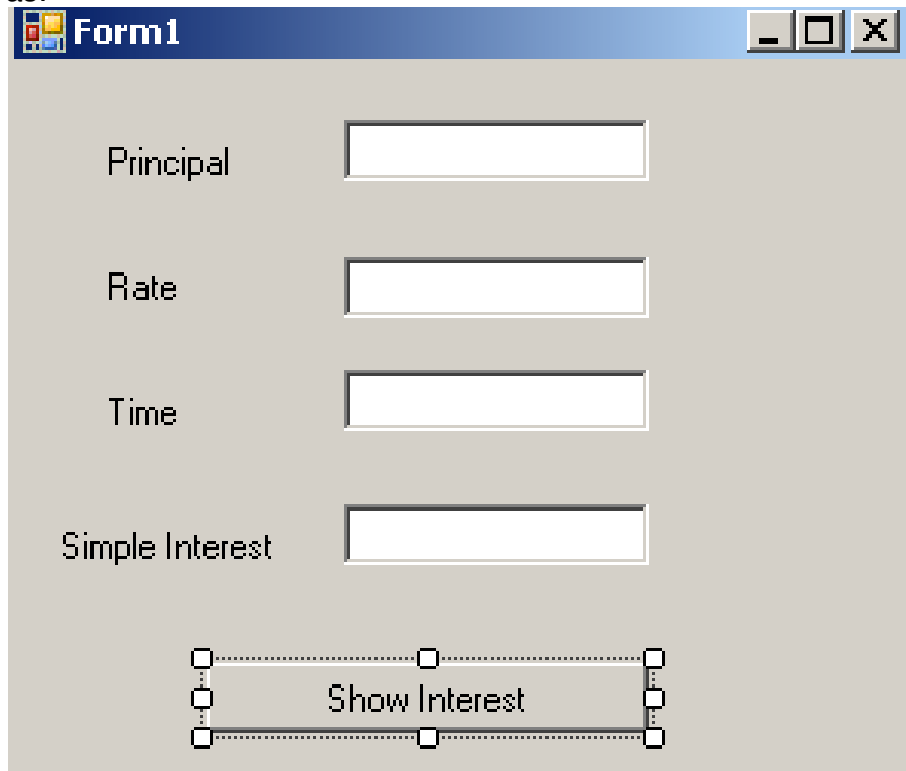
Assignment 14

VB.NET Programming
1. Create a form to calculate area and show area of rectangle as:-

2. Create a form to get principal, rate and time then calculate simple interest and show it as:-

3. Write a program to handle a savings-account withdrawal. The program should request the current balance and the amount of the withdrawal as input and then display the new balance. If the withdrawal is greater than the original balance, the program should display "Withdrawal denied." If the new balance is less than Rs. 150, the message "Balance below Rs. 150" should be displayed.

Assignment 15

VB.NET Programming

1. Write a program that displays a Celsius-to-Fahrenheit conversion table. Entries in the table should range from -40 to 40 degrees Celsius in increments of 5 degrees. Note: The formula f = (9/5)*c + 32 converts Celsius to Fahrenheit.
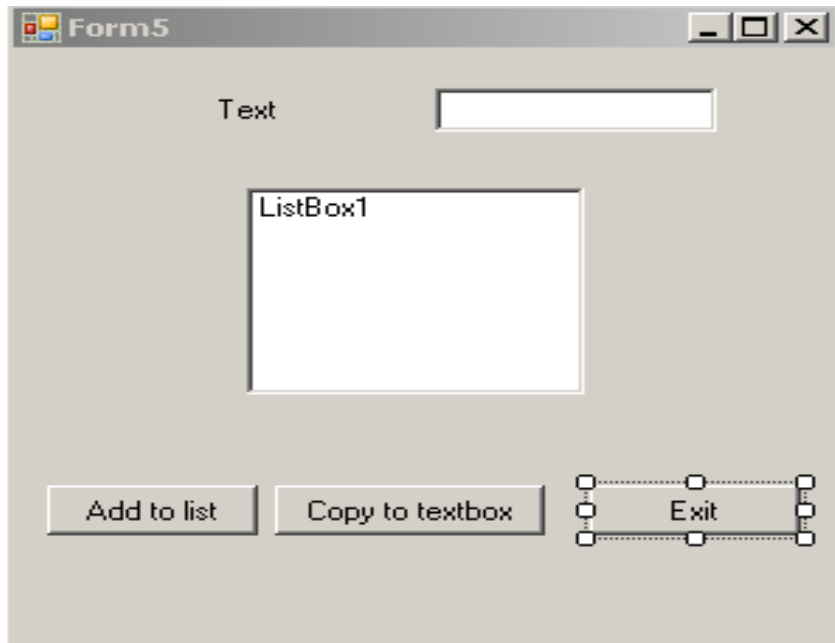
2. Write a program that accepts a word as input and determines if its letters are in alphabetical order. (Test the program with the words "almost," "imply," and "biopsy.")

Assignment 16

VB.NET Controls

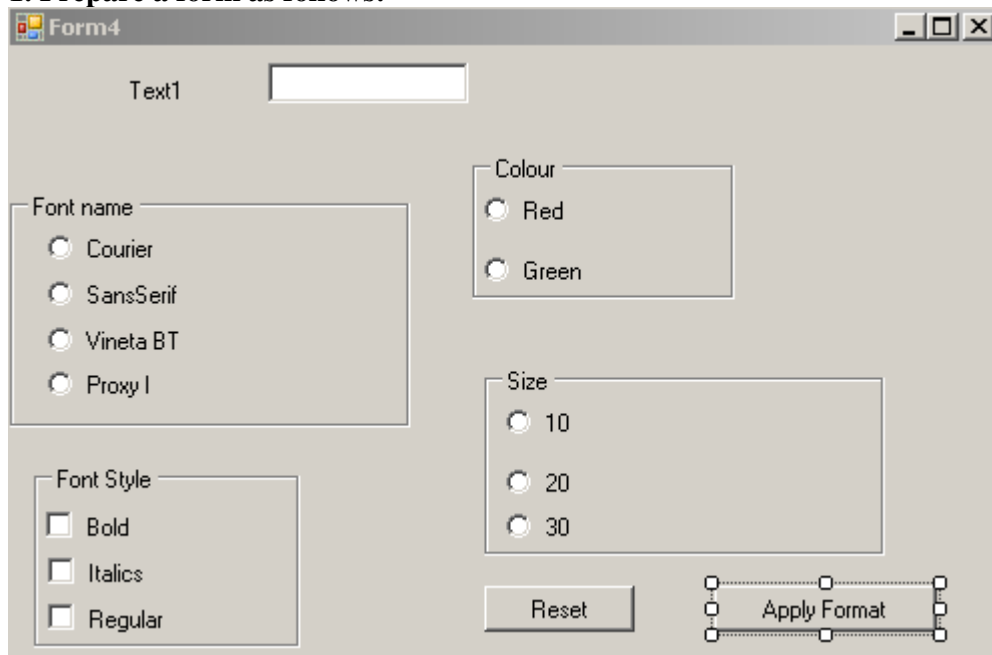1 . Write a program that takes a number and displays whether it is prime or not.

2.Write a program to add items to a listbox using a textbox and from listbox to textbox as:-
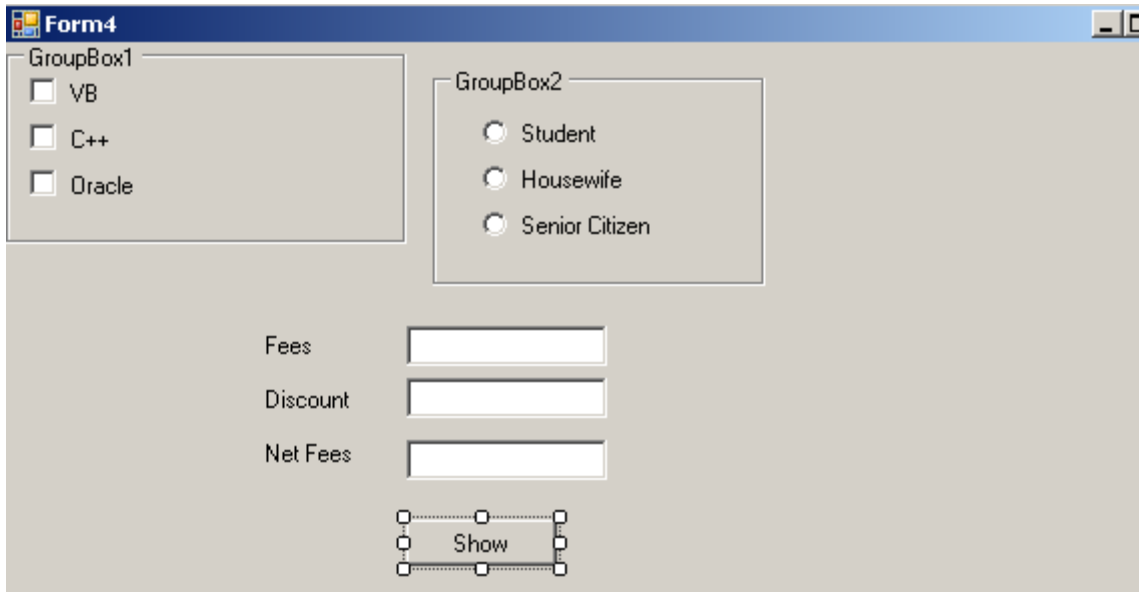
Assignment 17

RadioButtons and Checkboxes
1. Prepare a form as follows:-

The text present in the textbox should be formatted according to the selection of the user.

2. Create a form as follows:-

Fee details are as follows:-
VB 5000, C++ 3000, Oracle 6000

Discount:-
Student 15% of fees
Housewife 20% of fees
Senior Citizens 25% of fees.

On the click of show button , it should display fees, discount and net fees in the corresponding text boxes.

Assignment 18

Properties of Controls and Dialog Boxes
1. When one of the two buttons is pressed, the words on the button are displayed in the text box with the stated alignment. On the click of right button text in all textboxes should be aligned right. Note: Rely on IntelliSense to provide you with the proper settings for the Text Align property.
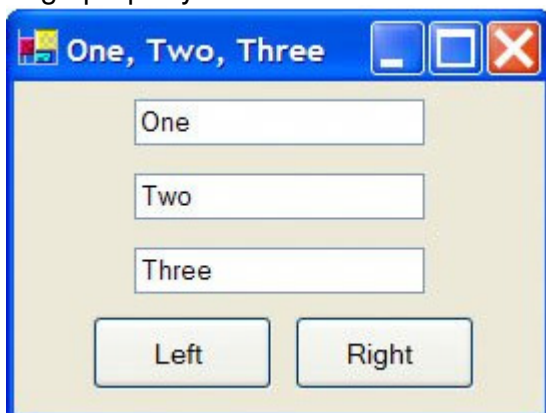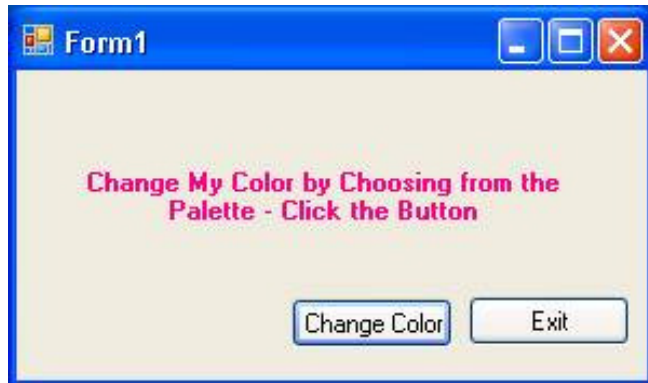

Object	Property	Setting
FrmAlign	Text	One,Two, Three

Object	Property	Setting
TxtBox1-3	ReadOnly	True
BtnLeft	Text	Left
btnRight	Text	Right

2.   Create a form as follows. On click of change color the colour of the text should be changed.

Assignment 19

Menus ,Structures and Collections

1.   Write a program with a single text box and a menu with the single top-level item Edit and the four second-level items Copy, Paste, Cut, and Exit. Copy should place a copy of the selected portion of textbox into the clipboard, Paste should duplicate the contents of the clipboard at the cursor position, Cut should delete a selected portion of the text box and place it in the clipboard, and Exit should terminate the program.

2.   Create a structure distance to store distance in feet and inches. Write a program to get two distances, find their difference and display them.

3. Create a structure person to store firstname, lastname, phone number and email id of a person. Write a program to create an arraylist and store the information of three persons. Also check the records should be unique.

Assignment 20

Procedures

1.Write a program that requests a number as input and displays three times the number. The output should be produced by a call to a Sub procedure named Triple.

2. Write a program that requests a word as input and displays the word followed by the number of letters in the word. The output should be produced by a call to a Sub procedure named HowLong

3. Write a program that requests a word of at most ten letters and a width from 10 through 20 as input and displays the word right-justified in a zone having the specified width. The output should be produced by a call to a Sub procedure named PlaceNShow.

Assignment 21

Functions and Modules

1. Write a program that requests three numbers as input and displays the average of the three numbers. The output should be produced by a call to a function named Average

2. Request a person's first name and last name as input and display the corresponding initials. (Create module)

3. Request the amount of a restaurant bill as input and display the amount, the tip (10 percent), and the total amount. (Create module)

Assignment 22

Arrays

1. Create a standard calculator using array of buttons:-
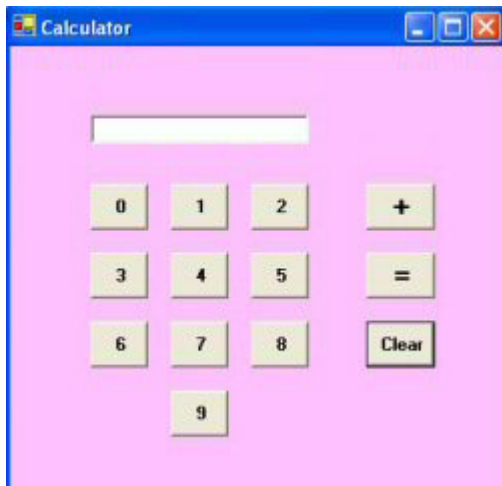
2. Given two arrays of type Double, p() and q(), each with upper bound 20, compute the sum of the products of the corresponding array elements, that is,
    p(0)*q(0) + p(1)*q(1) + p(2)*q(2) + ... + p(20)*q(20)

3. Airline Reservations. Write a reservation system for an airline flight. Assume the airplane has 10 rows with 4 seats in each row. Use a two-dimensional array of strings to maintain a seating chart. In addition, create an array to be used as a waiting list in case the plane is full. The waiting list should be "first come, first served," that is, people who are added early to the list get priority over those added later. Allow the user the following three options:
    a. Add a passenger to the flight or waiting list.
☞   Request the passenger's name.
☞   Display a chart of the seats in the airplane in tabular form.

☞   If seats are available, let the passenger choose a seat. Add the passenger to the seating chart.

☞   If no seats are available, place the passenger on the waiting list.

     b. Remove a passenger from the flight.

☞   Request the passenger's name.

☞   Search the seating chart for the passenger's name and delete it.

☞   If the waiting list is empty, update the array so the seat is available.

☞   If the waiting list is not empty, remove the first person from the list, and give him or her the newly vacated seat.

   c. Quit.

Assignment 23

Classes and Objects

1. Write a program that calculates an employee's pay for a week based on the hourly wage and the number of hours worked. All computations should be performed by an instance of the class Wages.

2. Write a program in which a college bookstore keeps track of and determines the retail prices of textbooks. All computations should be performed by an instance of the class Textbook. The class should have properties Title, Author, Cost (wholesale cost), Quantity (number of copies in stock), and the method Price, that is, the retail price. In this method the Price should be determined as 1.25 times the Cost.

3. Write a program that calculates the average of up to 50 numbers input by the user and stored in an array. See figure. The program should use a class named Statistics and have an AddNumber method that stores numbers into an array one at a time. The class should have a Count property that keeps track of the number of numbers stored and a method called Average that returns the average of the numbers.
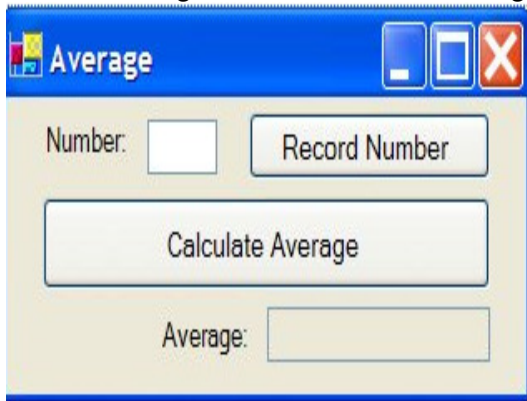
Assignment 24

Graphics and Reporting

1. Create a form as follows
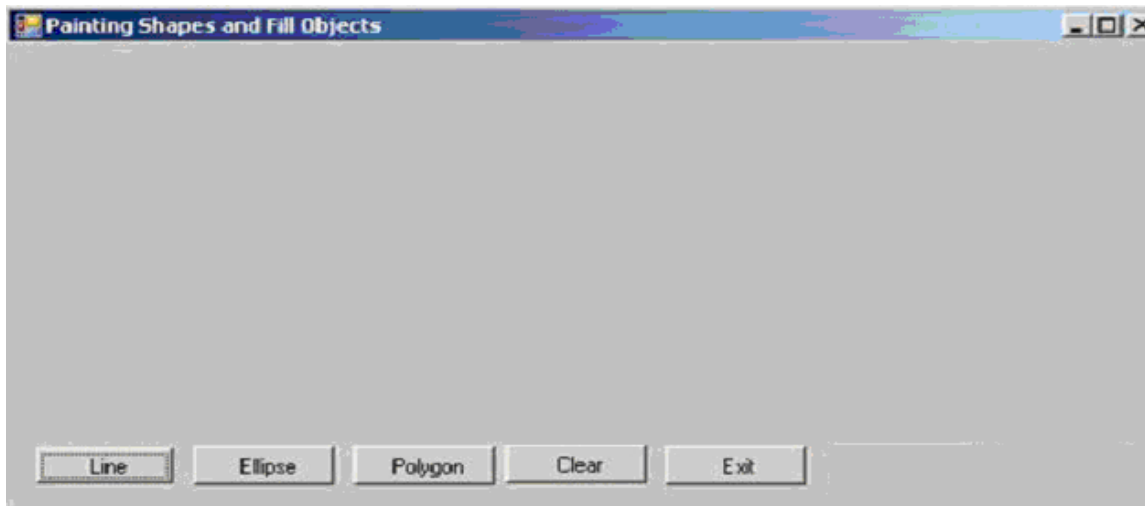
On click of Line, polygon it should draw it after getting starting and ending coordinates. On click of Ellipse it should draw it after getting upper left corner coordinates of bounding rectangle that defines the ellipse, width and height coordinates.

2. Write a program to display a company's payroll report in a list box. The program should read each employee's name, hourly rate, and hours worked from a file and produce a report in the form of the sample run shown in Figure . Employees should be paid time-and-a-half for hours in excess of 40.

Figure. Sample output .			
Payroll Report for week ending 11/17/06			
Employee	Hourly Rate	Hours Worked	Gross Pay
Al Adams	$6.50	38	$247.00
Bob Brown	$5.70	50	$313.50
Carol Coe	$7.00	40	$280.00
Final Total			$840.50

Assignment 25

Crystal Reports

Given tables OrderMaster , OrderDetails , Product .
OrderMaster
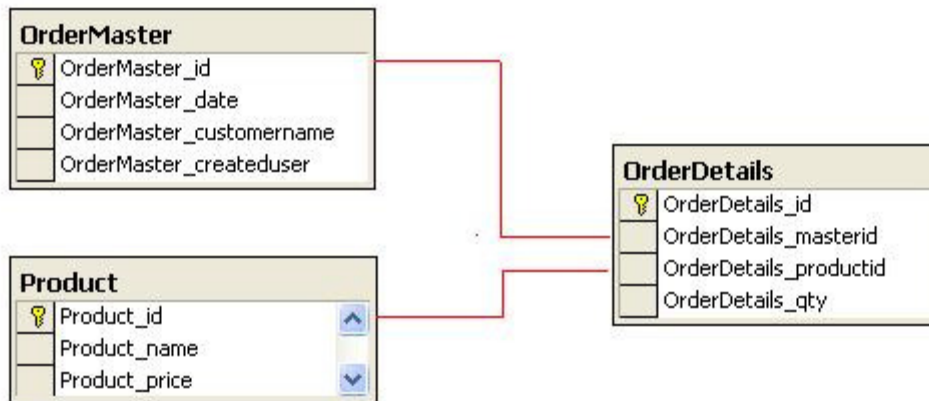OrderMaster_id, OrderMaster_date, OrderMaster_customer, OrderMaster_createduser
OrderDetails
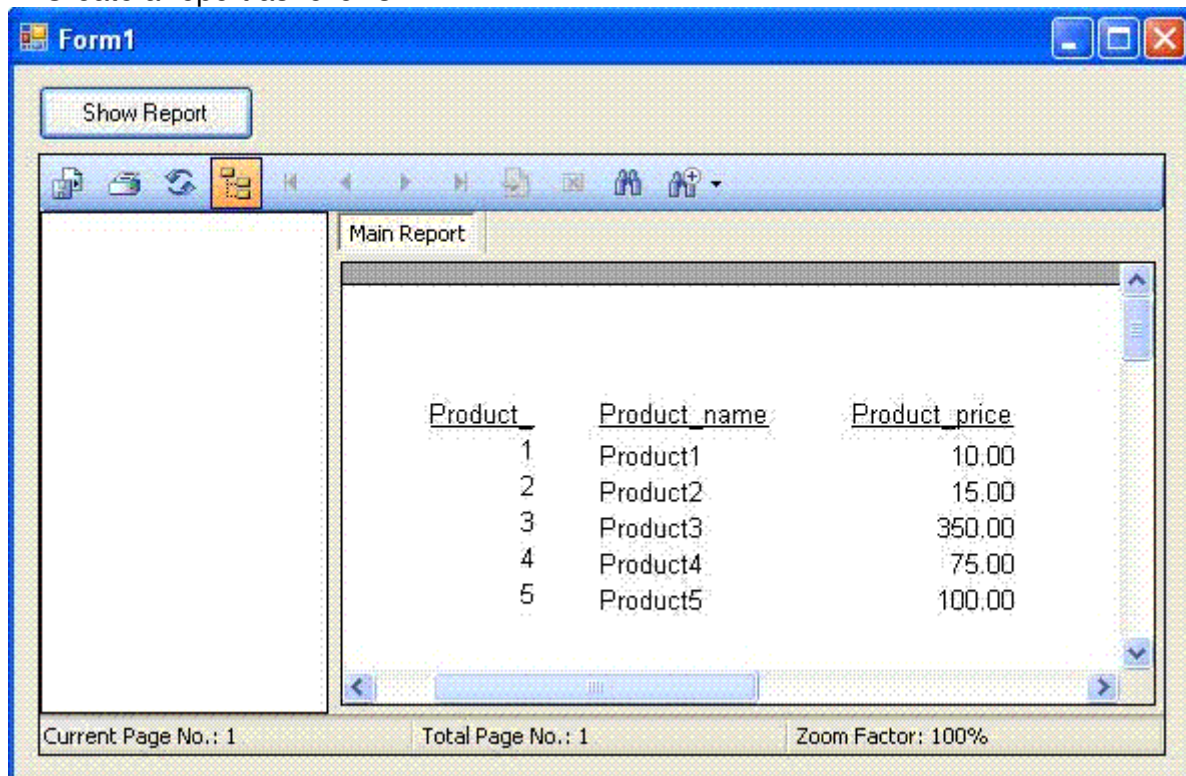OrderDetails_id, OrderDetails_mastered, OrderDetails_productid, OrderDetails_qty
Product
Product_id, Product_name, Product_price
The following picture shows the relations of each table :

1. Create a report as follows:-

2. Enter any price and generate a report of the Product list whose price is greater than or equal to the entered price.