Quadrant II – Transcript and Related Materials

Programme: Bachelor of Science (Second Year)
Subject: Computer Science
Course Code: CSS105
Course Title: Web Application Development Using ASP.NET
Unit: 07
Module Name: Ado.net: Connection Object, Command Object, Execute Reader, Execute non query, Execute Scalar;
Data Source: data reader, dataset, sqldatasource, connected & disconnected datasources.
Data controls: gridview, formview, datalist and detailsview.

Notes:

ADO.NET

- ✓ ADO.NET stands for ActiveX Data Object is a database access technology created by Microsoft as part of its .NET framework that can access any kind of data source.
- ✓ ADO.NET provides a bridge between the front end controls and the back end database.
- ✓ The ADO.NET objects encapsulate all the data access operations and the controls interact with these objects to display data, thus hiding the details of movement of data.
- ✓ ADO.NET uses SQL queries and stored procedures to read write update and delete data from a data source.

Connection Object

- ✓ The Connection object is the first component of ADO.NET
- ✓ The Connection object establishes a connection to a data source and works as a connection reference in Command and DataAdapter objects.
- ✓ Connection can also be established to a Command object to execute SQL queries, which can be used to retrieve, add, update and delete data to a data source.
- ✓ The Connection object also plays a useful role in creating a transaction.

- ✓ Transactions are stored in transactions objects, and transaction classes have all those features for dealing with transactions such as commit and rollback.

Command Object

- ✓ A Command object executes a SQL query and stored procedures to read, add, update, and delete data of a data source via a Data Adapter.
- ✓ A Data Adapter is a bridge between a dataset and the connection.
- ✓ Data Adapter uses Command Object to execute SQL queries and stored procedures.
- ✓ The DbCommand object represents the command or a stored procedure sent to the database from retrieving or manipulating data.

Execute Reader

- ✓ Execute Reader method is used to execute SQL queries or stored procedures that return a set of rows from the database.
- ✓ It is generally used with SELECT command where the query is required to fetch a set of data from the database.
- ✓ This method allows a way of reading a forward-only set of rows from the database.
- ✓ Its return type is Data Reader and a Data Reader object must always be declared in order to hold the result returned by the query.

Execute Reader method Example

```
SqlConnection SqlConnection_object=new SqlConnection();
SqlCommand SqlCommand_object=new SqlCommand();
SqlCommand_object.Connection=SqlConnection_object;
SqlCommand_object.CommandText = "select *  from  table_name";

SqlConnection_object.Open();
SqlDataReader dr = SqlCommand_object.ExecuteReader();
SqlConnection_object.Close();
```

- ✓ Execute non query method is used whenever we have to perform any action on the database which gives results only in the form of rows affected in that particular database.
- ✓ It is used to execute SQL queries or stored procedures that perform actions like insertion, deletion, and updating in a database.

- ✓ It does not return any actual data from the database. Rather, only the number of rows onto which the modification such as insertion, deletion, and updating has been performed is returned in an integer value result.
- ✓ For example: If we want to add the details of a new employee in a table in the database, then the Execute Non Query method will be used.

```
SqlConnection SqlConnection_object=new SqlConnection();
SqlCommand SqlCommand_object=new SqlCommand();
SqlCommand_object.Connection=SqlConnection_object;
SqlCommand_object.CommandText = "insert into table_name values('nikhil','27','Gurugram')";

SqlConnection_object.Open();
Int rows_affected = SqlCommand_object.ExecuteNonQuery();
SqlConnection_object.Close();

Return rows_affected;
```

Execute Scalar Method

- ✓ This method is used whenever a single value result (in the form of single-cell) is to be obtained from the database.
- ✓ It is also used to fetch the data of the first column of the first row from the result set from the database.
- ✓ A return type is an object in this method. It means a variable should be reserved for holding the return value.

```
SqlConnection SqlConnection_object=new SqlConnection();
SqlCommand SqlCommand_object=new SqlCommand();
SqlCommand_object.Connection=SqlConnection_object;
SqlCommand_object.CommandText = "select *  from  table_name";
SqlConnection_object.Open();
Object cell = SqlCommand_object.ExecuteScalar();
SqlConnection_object.Close();
Return cell;
```

Data Reader

- ✓ The Data Reader object is an alternative to the Data Set and Data Adapter combination.
- ✓ This object provides a connection oriented access to the data records in the database.

- ✓ These objects are suitable for read-only access, such as populating a list and then breaking the connection.
- ✓ Data Reader is used to read the data from the database and it is a read and forward only connection oriented architecture during fetch the data from database.
- ✓ Data Reader will fetch the data very fast when compared with dataset. Generally, we will use Execute Reader object to bind data to data reader.

Dataset

- ✓ DataSet is a disconnected orient architecture that means there is no need of No need to manually open and close connection in code to work with datasets.
- ✓ The DataSet represents a complete set of data including related tables, constraints, and relationships among the tables.
- ✓ You can select data form tables, create views based on table and ask child rows over relations.
- ✓ Also DataSet provides you with rich features like saving data as XML and loading XML data.

Sql data source

- ✓ ASP.NET 2.0 provides new data source and data-bound server controls, which allow developers to write full-fledged data-driven applications without writing even a single line of code.
- ✓ Data source controls provides data access functionality including selecting, updating, deleting, and inserting data without writing any lines of code.
- ✓ SQL datasource are designed to work with SQL Server databases.
- ✓ It uses Sql Server .NET data provider internally. Sql Server .NET data provider classes are defined in the System.Data.SqlClient namespace.
- ✓ It represents a connection to an ADO.NET data provider that returns SQL data.

Connected datasources

- ✓ Connected architecture refers to the fact that the connection is established for the full time between the database and application.
- ✓ Connected architecture is forward only and read-only. This means the connected mode will work only in one particular direction i.e. forward and that too for read-only purpose.
- ✓ For connected architecture, mainly the object of the DataReader class is used.
- ✓ DataReader is used to retrieve the data from the database and it also ensures that the connection is maintained for the complete interval of time.
- ✓ In this architecture, the application is directly linked with the Database.

Disconnected datasources

- ✓ Disconnected architecture refers to the mode of architecture in Ado.net where the connectivity between the database and application is not maintained for the full time.
- ✓ Connectivity within this mode is established only to read the data from the database and finally to update the data within the database.
- ✓ This means during the processing of the application, data is fetched from the database and kept in temporary tables. Whenever data is required, it is fetched from the temporary tables. And finally, when the operations are completed, the connection is established to update the data within the database from the temporary tables.
- ✓ Application issues query then retrieves and store results for processing. For this, objects of SqlDataAdapter and DataSet classes are used.

Data Control

- ✓ The data bound controls used in ASP.NET to display data in various forms and do various database activities such as Add, Edit, Update and Delete operations.

- ✓ The control makes the data more organized and presents the data in an efficient way for the viewers.
- ✓ ASP.NET provides a wide variety of rich controls that can be bound to data.
- ✓ The standard ASP.NET data presentation controls are:
  - DataList
  - DetailsView
  - FormView
  - GridView

Grid View Control

- ✓ ASP.NET provides a number of tools for showing tabular data in a grid, including the GridView control.
- ✓ The GridView control is used to display the values of a data source in a table.
- ✓ Each column represents a field where each row represents a record.
- ✓ The GridView control provides many built-in capabilities that allow the user to sort, update, delete, select and page through items in the control.
- ✓ The GridView control offers improvements such as the ability to define multiple primary key fields, improved user interface customization using bound fields and templates.

Grid View Example

Action	Id	Name	LastName	Email
Edit Delete Select	1	Mark	Arton	markarton03@outlook.com
Edit Delete Select	2	Tony	Jacob	tonyjacob@yahoo.com
Edit Delete Select	3	Robert	Brown	robertbrown@yahoo.com
Edit Delete Select	4	Lucas	Biglia	lucasbiglia@gmail.com

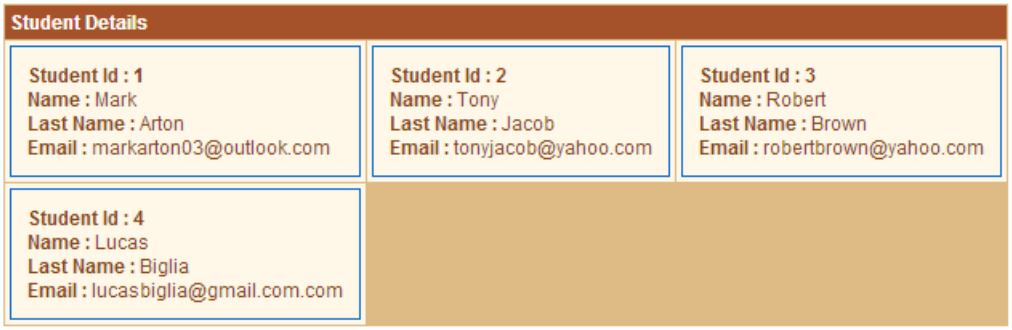
Form View Control

- ✓ The Form View control allows for a more flexible layout renders a single data item at a time from a data source, even if its data source exposes a multiple records data item from a data source.

- ✓ The FormView control renders all fields of a single record in a single table row. In contrast, the FormView control does not specify a pre-defined layout for displaying a record.
- ✓ When using templates, we can place any control such as a dropdown list, checkbox, GridView and so on.
- ✓ A FormView is a databound control used to insert, display, edit, update and delete data in ASP.NET that renders a single record at a time.
- ✓ Example:-

Datalist Control

- ✓ DataList allows you to repeat columns horizontally or vertically.
- ✓ The DataList control renders data as a table and enables you to display data records in various layouts, such as ordering them in columns or rows.
- ✓ We can use a DataList control where we need a single-column list.
- ✓ The DataList control works like the Repeater control, used to display the data in a repeating structure, such as a table.
- ✓ It displays data in a format that you can define using a template and styles.
- ✓ DataList control includes options for horizontal or vertical layout and it also allows you to set how the data should be repeated, as flow or table layout.



Details View Control

- ✓ The DetailsView control uses a table-based layout where each field of the data record is displayed as a row in the control.
- ✓ The DetailsView control displays one row from a data source at a time by rendering an HTML table.
- ✓ It shows the details for the row in a separate space.
- ✓ We can also use Cascading Style Sheets (CSS) to provide styles to a DetailsView control.
- ✓ A DetailsView control appears as a form of recording and is provided by multiple records as well as insert, update and delete record functions.
- ✓ Example:-

Id	1
First Name	Mark
Last Name	Arton
Email	markarton03@outlook.com
Delete	
New	
Edit	
1 2 3 4	