Enterprise Application Programming

Semester: 3	**Curriculum Code:** ADSE
Duration: 90 minutes	**Total Marks:** 20
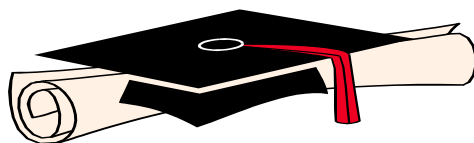
Practical Examination Paper

Do not write on this question paper and return it to the Invigilator after the examination.

Write a web application to manage a Music Store, using Code First Approach.

- Templates > Web > ASP.NET Web Application (Visual C#) > Web API

- Project name: *EAP_<ClassName>_<StudentName>*

- Pagination Library Installation Commands: `Install-Package PagedList`
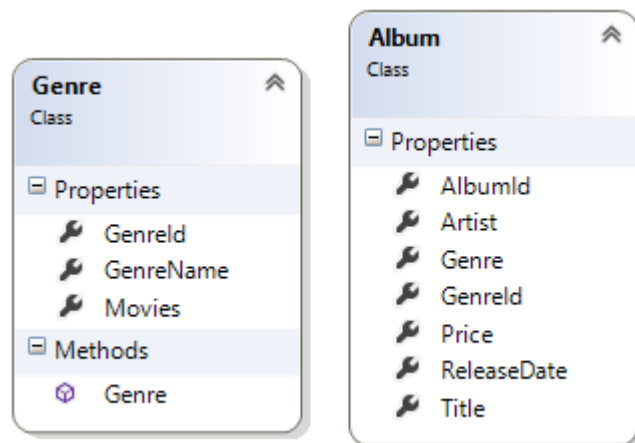
  `Install-Package PagedList.Mvc`

1. Model Layer [3]

public class **Genre** (1.5 mark)

Access Modifier	Data Type	Property	Accessors	Vietnamese
public	int	GenreId	get; set;	Id thể loại
public	string	GenreName	get; set;	Tên thể loại
public virtual	ICollection<Album>	Albums	get; set;	

Access Modifier	Constructor	Description
public	Genre()	Initializes the property **this.Albums** to a new **HashSet<Album>()**

public class **Album** (1.5 mark)

Access Modifier	Data Type	Property	Accessors	Vietnamese
public	int	AlbumId	get; set;	Id album nhạc
public	string	Title	get; set;	Tựa Đề album
public	DateTime	ReleaseDate	get; set;	Ngày Phát Hành
public	string	Artist	get; set;	Ca sĩ/Nhóm nhạc
public	double	Price	get; set;	Giá (đô)
public	int	GenreId	get; set;	Id thể loại
public virtual	Genre	Genre	get; set;	Thể Loại

Genre
Class

☐ Properties
- GenreId
- GenreName
- Movies

☐ Methods
- Genre

Album
Class

☐ Properties
- AlbumId
- Artist
- Genre
- GenreId
- Price
- ReleaseDate
- Title

2. Data Access Layer   [3]

public class **DataContext**   inheriting from the class DbContext **(1.5 mark)**

Access Modifier	Data Type	Property	Accessors	Vietnamese
public virtual	DbSet<Genre>	Genres	get; set;	Tập thực thể Loại Nhạc
public virtual	DbSet<Album>	Albums	get; set;	Tập thực thể Album

Access Modifier	Constructor	Description	
public	DataContext()	Sets initializer of Database to a new **DataInitializer.**	

   Note: you should create a SQL Server Database: **~/App_Data/DataContext.mdf**

public class **DataInitializer** inheriting from the class **DropCreateDatabaseIfModelChanges<DataContext>** **(1.5 mark)**

Access Modifier	Return Type	Method	Description
protected override	void	**Seed**(DataContext context)	Adds new items to database sets **DataContext** class

Sample Data   of Genres (Dữ liệu mẫu Thể Loại Nhạc)

```
{GenreId = 1, GenreName = "Pop"}
{GenreId = 2, GenreName = "Rock"}
{GenreId = 3, GenreName = "Hip Hop"}
{GenreId = 4, GenreName = "Jazz"}
{GenreId = 5, GenreName = "Punk"}
{GenreId = 6, GenreName = "Rap"}
{GenreId = 7, GenreName = "R&B"}
{GenreId = 8, GenreName = "Country"}
{GenreId = 9, GenreName = "Latin"}
```

Sample Data   of Albums (Dữ liệu mẫu Album)

```
{AlbumId=01, Title="Twenty File", ReleaseDate=DateTime.Parse("2015-11-20"), Artist="Adele", GenreId= 1, Price = 9.99}
{AlbumId=02, Title="Nineteen Eighty-Nine", ReleaseDate=DateTime.Parse("2014-10-27"), Artist="Taylor Swift", GenreId= 1, Price = 10.99}
{AlbumId=03, Title="A million", ReleaseDate=DateTime.Parse("2016-09-30"), Artist="Bon Iver", GenreId= 2, Price = 9.99}
{AlbumId=04, Title="Meteora", ReleaseDate=DateTime.Parse("2003-03-25"), Artist="Linkin Park", GenreId= 2, Price = 7.99}
{AlbumId=05, Title="Nevermind", ReleaseDate=DateTime.Parse("1991-09-24"), Artist="Nivarna", GenreId= 2, Price = 9.99}
{AlbumId=06, Title="To Pimp a Butterfly", ReleaseDate=DateTime.Parse("2015-03-15"), Artist="Kendrick Lamar", GenreId= 3, Price = 8.99}
{AlbumId=07, Title="The Chronic", ReleaseDate=DateTime.Parse("1992-12-15"), Artist="Dr.Dre", GenreId= 3, Price = 9.99}
{AlbumId=08, Title="Comes Away With Me", ReleaseDate=DateTime.Parse("2002-02-26"), Artist="Norah Jones", GenreId= 4, Price = 6.99}
{AlbumId=09, Title="Kind of Blues", ReleaseDate=DateTime.Parse("1959-08-17"), Artist="Miles Davids", GenreId= 4, Price = 7.99}
{AlbumId=10, Title="Dookie", ReleaseDate=DateTime.Parse("1994-02-01"), Artist="Green Day", GenreId= 5, Price = 8.99}
{AlbumId=11, Title="Relapse", ReleaseDate=DateTime.Parse("2009-05-15"), Artist="Eminem", GenreId= 6, Price = 9.99}
{AlbumId=12, Title="Get Rich or Die", ReleaseDate=DateTime.Parse("2003-02-06"), Artist="Tryin", GenreId= 6, Price = 7.99}
{AlbumId=13, Title="Blonde", ReleaseDate=DateTime.Parse("2016-08-20"), Artist="Frank Oceans", GenreId= 7, Price = 8.99}
{AlbumId=14, Title="Love, Marriage & Divorce", ReleaseDate=DateTime.Parse("2014-02-04"), Artist="Babyface & Toni Braxton", GenreId= 7, Price = 9.99}
{AlbumId=15, Title="Lemonade", ReleaseDate=DateTime.Parse("2016-04-23"), Artist="Beyonce", GenreId= 1, Price = 11.99}
{AlbumId=16, Title="Purpose", ReleaseDate=DateTime.Parse("2015-11-13"), Artist="Justin Bieber", GenreId= 1, Price = 9.99}
{AlbumId=17, Title="Los Duo", ReleaseDate=DateTime.Parse("2015-02-10"), Artist="Joan Gabriel", GenreId= 9, Price = 7.99}
{AlbumId=18, Title="They Don't KNow", ReleaseDate=DateTime.Parse("2016-09-09"), Artist="Jason Aldean", GenreId= 9, Price = 9.99}
```

3. Controller.   [1]

- Add Scaffold: **MVC Controller with views, using Entity Framework.**

- Model Class: **Album**

- Data Context Class: **DataContext**

- Controller Name: **AlbumsController**.

Note: Application's global variables can be configured within the application file **Global.asax.cs**

4. User Authentication & Authorization [1]

- Only admin user can create/ edit/ delete data of items.

- Anyone can view the list of items as well as details of each.

Register an admin account for testing authorization you have set up above:

(email = **admin@mvc.com**); username = **admin**; password = **Abcd@1234**

5. Advanced functionalities. [6]

- Paging.

- Searching by movie's title.

- Sorting one or more columns (in both ascending and descending order).

6. Data Validation [4]

- All information fields must be required (Except AlbumId, GenreId and Genre).

- Movie title length must be between 3 and 32.

- Release Date must be a date type.

- Price($) must be within a range from 1to 15.

Note: You are free to customize the style of the web app by using the libraries (images, css, and JavaScript) attached with this exam paper.

7. Web API Service [2]

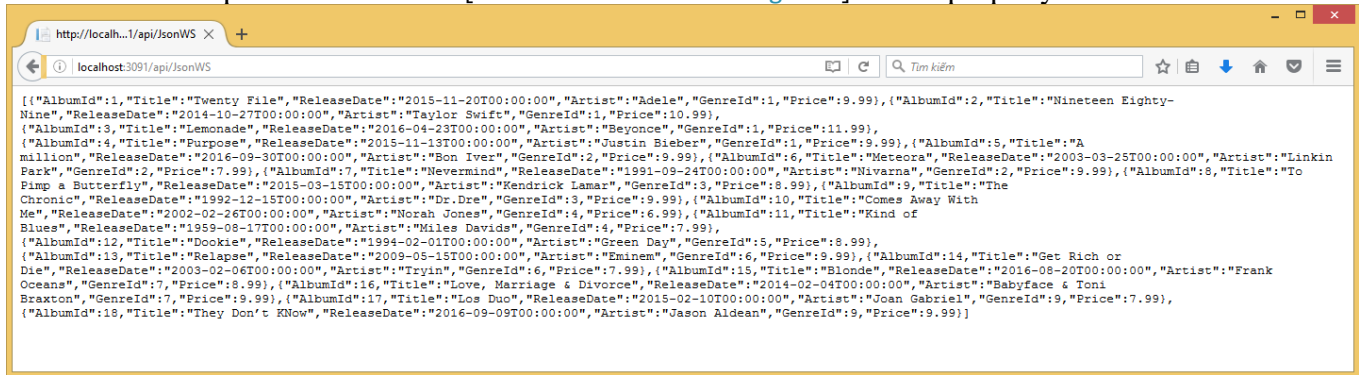public class **JsonWSController** inheriting from the base class System.Web.Http.ApiController

Access Modifier	Data Type	Field	Description
private	DataContext	db	Initialized value: new DataContext( )
Access Modifier	**Return Type**	**Method**	**Description**
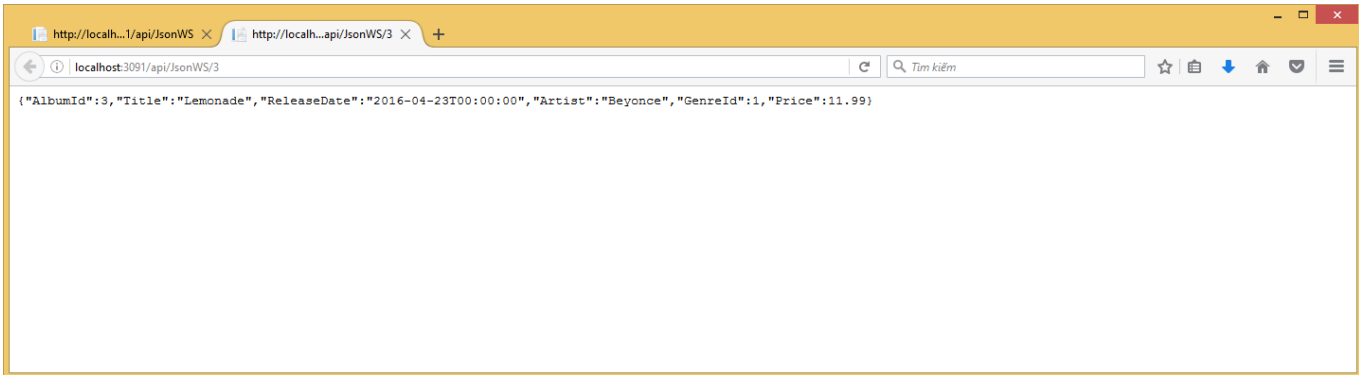
public	JToken	Get( )	Returns Json Data of the list of Albums
public	JToken	Get(int id)	Returns Json Data of an Album details

Note:

- **JsonWSController.cs** must be placed under the folder: *~/Controllers*

- You have to put the annotation [Newtonsoft.Json.JsonIgnore] on the property **Genre** of class **Album**.

[{"AlbumId":1,"Title":"Twenty File","ReleaseDate":"2015-11-20T00:00:00","Artist":"Adele","GenreId":1,"Price":9.99},{"AlbumId":2,"Title":"Nineteen Eighty-Nine","ReleaseDate":"2014-10-27T00:00:00","Artist":"Taylor Swift","GenreId":1,"Price":10.99},
{"AlbumId":3,"Title":"Lemonade","ReleaseDate":"2016-04-23T00:00:00","Artist":"Beyonce","GenreId":1,"Price":11.99},
{"AlbumId":4,"Title":"Purpose","ReleaseDate":"2015-11-13T00:00:00","Artist":"Justin Bieber","GenreId":1,"Price":9.99},{"AlbumId":5,"Title":"A million","ReleaseDate":"2016-09-30T00:00:00","Artist":"Bon Iver","GenreId":2,"Price":9.99},{"AlbumId":6,"Title":"Meteora","ReleaseDate":"2003-03-25T00:00:00","Artist":"Linkin Park","GenreId":2,"Price":7.99},{"AlbumId":7,"Title":"Nevermind","ReleaseDate":"1991-09-24T00:00:00","Artist":"Nivarna","GenreId":2,"Price":9.99},{"AlbumId":8,"Title":"To Pimp a Butterfly","ReleaseDate":"2015-03-15T00:00:00","Artist":"Kendrick Lamar","GenreId":3,"Price":8.99},{"AlbumId":9,"Title":"The Chronic","ReleaseDate":"1992-12-15T00:00:00","Artist":"Dr.Dre","GenreId":3,"Price":9.99},{"AlbumId":10,"Title":"Comes Away With Me","ReleaseDate":"2002-02-26T00:00:00","Artist":"Norah Jones","GenreId":4,"Price":6.99},{"AlbumId":11,"Title":"Kind of Blues","ReleaseDate":"1959-08-17T00:00:00","Artist":"Miles Davids","GenreId":4,"Price":7.99},
{"AlbumId":12,"Title":"Dookie","ReleaseDate":"1994-02-01T00:00:00","Artist":"Green Day","GenreId":5,"Price":8.99},
{"AlbumId":13,"Title":"Relapse","ReleaseDate":"2009-05-15T00:00:00","Artist":"Eminem","GenreId":6,"Price":9.99},{"AlbumId":14,"Title":"Get Rich or Die","ReleaseDate":"2003-02-06T00:00:00","Artist":"Tryin","GenreId":6,"Price":7.99},{"AlbumId":15,"Title":"Blonde","ReleaseDate":"2016-08-20T00:00:00","Artist":"Frank Oceans","GenreId":7,"Price":8.99},{"AlbumId":16,"Title":"Love, Marriage & Divorce","ReleaseDate":"2014-02-04T00:00:00","Artist":"Babyface & Toni Braxton","GenreId":7,"Price":9.99},{"AlbumId":17,"Title":"Los Duo","ReleaseDate":"2015-02-10T00:00:00","Artist":"Joan Gabriel","GenreId":9,"Price":7.99},
{"AlbumId":18,"Title":"They Don't KNow","ReleaseDate":"2016-09-09T00:00:00","Artist":"Jason Aldean","GenreId":9,"Price":9.99}]

{"AlbumId":3,"Title":"Lemonade","ReleaseDate":"2016-04-23T00:00:00","Artist":"Beyonce","GenreId":1,"Price":11.99}