Exercise 1: Building a Data Access Layer for an E-commerce Application

Statement:

Create a simplified data access layer (DAL) for an e-commerce application using Entity Framework Core, focusing on code-first approach.

Hints for Implementation:

- **Define Models:** Start by creating simple classes to represent the entities in your e-commerce application, such as Product, Customer, and Order. These classes should include properties that reflect the data you wish to store in the database.
- **DbContext Class:** Implement a class that inherits from DbContext. This class will manage the database operations for your entities. Use DbSet<T> properties to include your entities in the model.
- **Configuration:** Configure the database connection string directly in your DbContext class's OnConfiguring method. This is crucial for establishing a connection to your database.
- **Migrations:** Utilize EF Core migrations to scaffold a database that matches your model. This allows you to create and update your database schema based on the models you've defined.

```
marcelogomesmarques@MACBOOK-PRO-DE-MARCELO DALECommerceApp % dotnet ef migrations add InitialCreate
Build started...
Build succeeded.
Done. To undo this action, use 'ef migrations remove'
marcelogomesmarques@MACBOOK-PRO-DE-MARCELO DALECommerceApp % dotnet ef database update
Build started...
Build succeeded.
Applying migration '20240327204044_InitialCreate'.
Done.
marcelogomesmarques@MACBOOK-PRO-DE-MARCELO DALECommerceApp %
```

```
Enter customer data:
---------------------------------------------------------
Name: Marcelo Marques
Kind: High
```

```
Please, review your entery and try again! Details: Requested value 'High' was not found.

Press any key to continue.
```

```
Enter customer data:
----------------------------------------------------------------------------
Name: Marcelo Gomes Marques
Kind: Person
Email: mgm3000@gmail.com
Password: 1234567
```

```
See the order entry status:
----------------------------------------------------------------------------
Client: Person: Marcelo Gomes Marques
----------------------------------------------------------------------------

    Order: 1: PaymentConfirmed   - Created: 03-27-2024 Date to Delivery: 04-06-2024    Delivery Date:
        * Value: 599.99 | Quantity: 1 | GameConsole: X-BOX Series X
        * Value: 299.98 | Quantity: 2 | GameControler: X-BOX Series Wireless Controler
        * Value: 115.50 | Quantity: 2 | GameControler: X-BOX Series Controler

Sales Summary:
----------------------------------------------------------------------------
Invoice Total Value: 1015.47
Invoice Average Value by Item: 338.49

Press any key to continue.


Querying the OrderId 1
----------------------------------------------------------------------------
Before Updating Entity State: Unchanged
After Updating Entity State: Modified
After SaveChanges Entity State: Unchanged

Press any key to continue.



Updating the Order Delivery date and status
---------------------------------------------------------------------------------
Client: Person: Marcelo Gomes Marques
---------------------------------------------------------------------------------

    Order: 1: Delivered    - Created: 03-27-2024 Date to Delivery: 04-06-2024   Delivery Date: 3/29/2024 10:54:46 PM
        * Value: 599.99 | Quantity: 1 | GameConsole: X-BOX Series X
        * Value: 299.98 | Quantity: 2 | GameControler: X-BOX Series Wireless Controler
        * Value: 115.50 | Quantity: 2 | GameControler: X-BOX Series Controler

Sales Summary:
---------------------------------------------------------------------------------
Invoice Total Value: 1015.47
Invoice Average Value by Item: 338.49

Press any key to continue.



Delete Order with OrderId 1:
---------------------------------------------------------------------------------
Entity State Before Removing: Unchanged
Entity State After Removing: Detached

Press any key to close the app.
```

Exercise 2: Implementing Complex Queries Using LINQ with Entity Framework

Statement:

Write complex queries using LINQ to query the e-commerce application's database for specific data insights, such as total sales per product, products never ordered, and customers with orders above a certain value.

Hints for Implementation:

- **Total Sales per Product:** Use LINQ to aggregate data from your orders and products. You might need to group by product ID and sum up the total sales for each group. This query demonstrates how to perform aggregations and work with related data.
- **Products Never Ordered:** Craft a LINQ query that selects products which do not appear in any orders. This might involve a combination of Where, SelectMany, and Any methods to filter out products based on their presence in orders.
- **High-Value Customers:** To find customers with orders exceeding a certain value, aggregate the total value of orders per customer. Then, filter these aggregates to identify customers meeting your criteria for "high-value." This will involve grouping orders by customer and calculating the total value of orders in each group.

```
Database path: /Users/marcelogomesmarques/Library/Application Support/eCommerceApp.db.

Reading files from path: /Users/marcelogomesmarques/Projects/CSharp/DALComplexQueries/DALECommerceApp/Resources
Total Customers records: 10

Total Products records: 121

Total Orders records: 32

Total Order Items records: 282

Press any key to continue.
```

```
Products Never Ordered:

ID:     | Product Name:                                      | Category:
--------+----------------------------------------------------+---------------
12      | GAME Holly World                                   | Games
14      | GAME Take Care Babies                              | Games
33      | PlayStation 2                                      | GameConsole
61      | Playstation 2                                      | GameConsole
65      | X-Box 360                                          | GameConsole

Press any key to continue.
```

```
Total Sales per Product:

Product:                                            | Amount:| Value:
----------------------------------------------------+--------+---------------
Smart TV 4k QLED                                    |   202 |  $1,014,354.46
Smart TV 4k                                         |   240 |    $667,109.60
Mesa Gamer                                          |   312 |    $642,637.78
PlayStation 5                                       |   100 |    $600,012.00
Playstation 5 Pack God Of Wars                      |   110 |    $564,918.90
X-Box Series S                                      |   260 |    $534,694.50
X-Box Series X Pack Doom and Forsa                  |   100 |    $419,946.00
X-Box Series SXPack Doom/Forsa 3 months of Game Pass|    70 |    $297,739.80
AUT_RECL_ARMCHAIR                                   |   112 |    $286,239.28
X-Box Series X Pack Fifa                            |    70 |    $285,162.10
X-Box Series X                                      |    70 |    $281,455.70
Playstation 4 Pro                                   |    60 |    $238,528.70
Cadeira Gamer                                       |   100 |    $190,081.00
X-Box Series S Pack Doom and Forsa                  |    80 |    $179,870.50
Playstation 4 Pack God Of Wars                      |    80 |    $178,482.70
X-Box Series S Pack Doom/Forsa 3 months of Game Pass|    80 |    $178,170.80
FiFa 17                                             |   316 |    $112,619.74
Forsa 6 series X                                    |   276 |    $104,495.68
God Of War 5                                        |   376 |     $99,874.74
X-Box Series S Pack Fifa                            |    30 |     $62,985.70
Nintendo Switch                                     |    25 |     $62,495.00
Hirizon 2 Playstation 5                             |   170 |     $59,853.50
HD External 2 Tb                                    |   110 |     $56,716.80
God Of War 5 Playstation                            |   170 |     $55,401.40
Playstation 4                                       |    25 |     $49,750.25
Smart TV Full HD                                    |    25 |     $44,978.00
HD External 1 Tb                                    |   110 |     $43,931.10
SDD 500 Gb                                          |   100 |     $39,976.00
Controle Playstation 5 sem fio                      |    60 |     $38,648.40
Controle Playstation 4 sem fio                      |   100 |     $25,993.00
Playstation 3                                       |    25 |     $25,037.75
X-Box One S                                         |    25 |     $25,023.50
X-Box One                                           |    25 |     $22,514.50
Gears of War 6 Series S                             |    95 |     $20,298.15
X-Box One Controle sem fio                          |   100 |     $20,088.00
Monitor Full HD                                     |   100 |     $20,042.00
Controle Playstation 4                              |   100 |     $19,921.00
FiFa 16                                             |    70 |     $18,229.60
Forsa 6                                             |    70 |     $18,013.70
Monitor 4k Widescreen Curvo                         |    25 |     $17,518.50
Luminaria God of Wars                               |   100 |     $16,028.00
Controle Playstation 3                              |   100 |     $15,907.00
Handset X-Box Profesional                           |    61 |     $15,529.97
X-Box Series Controle sem fio                       |    25 |     $15,002.50
HD External 4 Tb                                    |    25 |     $14,998.25
Monitor 4k                                          |    25 |     $14,975.75
XBOX_CONTROL                                        |    50 |     $14,422.50
Hirizon 2                                           |    65 |     $14,005.70
Forsa 5                                             |    70 |     $13,834.60
Monitor Widescreen Curvo                            |    25 |     $12,504.50
FiFa 13                                             |   120 |     $10,820.80
Handset sterio                                      |   100 |      $9,062.00
X-Box Series Controle com fio                       |    35 |      $8,887.10
X-Box One Controle com fio                          |   105 |      $8,462.55
HD External 500 Gb                                  |    30 |      $8,304.70
CONTROL                                             |   100 |      $8,060.00
X-Box 360 Controle sem fio                          |   100 |      $7,524.00
HOMETHEATER7.1CH                                    |     2 |      $7,161.53
Gears of War 6                                      |    30 |      $6,217.00
God Of War 4                                        |    30 |      $5,966.20
Chaveiro X-Box                                      |   110 |      $5,739.40
FiFa 15                                             |    30 |      $5,573.00
X-Box 360 Controle com fio                          |   100 |      $5,037.00
Controle Playstation 2                              |   100 |      $4,999.00
Handset mono                                        |   100 |      $4,997.00
Gears of War 3                                      |   110 |      $4,306.20
GTX-4060TI 16 GB                                    |     3 |      $3,991.72
```

```
High-Value Customers (greater than $ 10000):

Customer:                                        | Amount: | Value:
-------------------------------------------------+---------+----------------
Wallmarket                                       |    4645 | $4,513,556.70
Extra Supermarkets                               |    1305 | $2,302,115.45
XP Entreteriments                                |     477 |   $984,267.41
Game Gears                                       |     560 |    $98,204.45
Chris Evens                                      |      20 |    $14,057.00
Henry Cavill                                     |      36 |    $10,433.41

Press any key to close the app.
```