



Instituut voor
Communicatie,
Media & Informatietechnologie

Naam:

Studentnr:

Klas:

General information

Course code : INFDTB01-D, INFDTB21-D
Course name : DEVELOPMENT - DATABASE
Full-time / Part-time : FULL-TIME / PART-TIME (BOTH)
Type of exam : ~~Regular~~/ **Resit**
Exam form : ~~Written / Reminde~~ / Visual Studio /(VS Code)
Period : 2
Classes : ABCDEFG, RETAKERS, PART-TIME
Duration in minutes : 120 (BO-120+30 = 150) minutes
Course holder : SALEEM ANWAR
Author : S. ANWAR
Second reader : Giacomo, F.Di., Maggiore, G.

This exam consists of:

- ☐ A cover page with ...6... numbered pages
- ☐ Multiple choice
- ☐ Case
- ☒ Open question

Allowed tools:

- ☐ Non-graphic calculator
- ☐ Scrap paper
- ☐ Dictionary, type
- ☐ Cheat sheet
- ☒ Other, namely ...**Laptop (with visual studio/ (VS Code) application only)**

Write your answers and calculations:

- ☐ on the examination paper handed out, so not on the exam
- ☒ In visual studio/ VS Code on designated
- ☐ on the enclosed answer form

Type of draft paper for elaboration:

- ☐ lined paper
- ☐ squared paper

Finally:

You are required to submit exam solution (**hrStudentNr.cs**) file in teams under invigilator/ technical teacher presence.

Good luck!

Exam Setup:

1. Creating app

Visual Studio

- a. Create a console app with logical name (say Exam)
File -> New -> Project -> Console App (c#) -> next [ProjectName]-> Finish
- b. Add the following NuGet Packages (right click in solution explorer and goto Manage NuGet Packages OR Tools-> NuGet Package Manager-> Manage NuGet Package)
Microsoft.EntityFrameworkCore.Design
Npgsql.EntityFrameworkCore.PostgreSQL
Microsoft.EntityFrameworkCore.Tools

Visual Studio Code / CLI

- a. Create a console app with logical name (say Exam)
`dotnet new console -o Exam`
`cd Exam`
- b. Add the following NuGet Packages
`dotnet add package Microsoft.EntityFrameworkCore.Design`
`dotnet add package Npgsql.EntityFrameworkCore.PostgreSQL`
- c. Open project directory in VS Code (you may add packages via terminal in vs code)

2. Add Given Model.cs and replace Program.cs file in project

Files available in teams under assignment **2223 FC Exam Database**


Change connection string (password and maybe port # for postgres)

Visual Studio

Add-Migration migrationName
Update-Database

Visual Studio Code / CLI

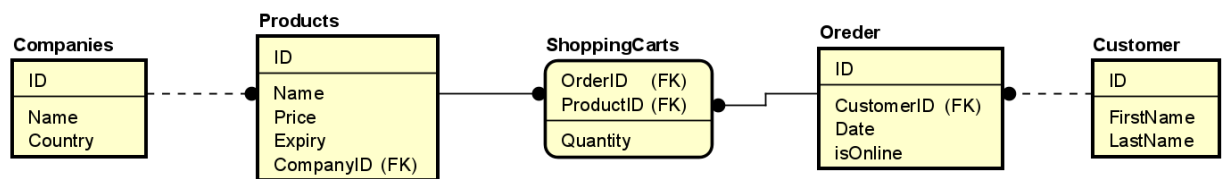
```
dotnet tool install --global dotnet-ef
dotnet ef migrations add migrationName
dotnet ef database update
```

3. **Run the application** (start debugging  F5) / `dotnet run` and make sure Database created and populated, DataSeeding should happen only once.
4. **Add new file with following name format (hr123456.cs) where use your complete student number including zeros instead of 123456. Write static methods to solve each exercise, look at the program.cs for signature of static methods.**
5. **Don't use reference navigation properties. Raw SQL queries will not be accepted as valid answer.**
6. **Very IMPORTANT:** Return solution file (hr123456.cs) in teams as a proof of your exam and for evaluation/grade. No submission, no grade.
7. **Academic honesty:** we expect academic honesty from all of the students, a student found using illegal means will face inquiry and disciplinary actions.
8. During exam you are allowed to use Visual Studio/ VS code only, and Teams for final submission under supervision of invigilator/technical teacher.
9. You are not allowed to modify Model and Entity classes.
10. The exam consists of 100 points in total, you need to secure 55 points to pass the exam.

Exam INFDTB (2022-23)

The case study: (Restaurant)

- This case study is about a restaurant dine out facility
- Following data is recorded.
- The Restaurant menu is organised into Food Categories, and Sub categories. Where in each category/Sub category there are some food items.
- There is no fixed configuration of tables/chairs so we don't save table information, However two or more customers visiting together maybe allocated a table, in order to calculate collective bill if required.
- A customer may order one or more Food Item(s).



Below you may find sample data for each entity/table stored in database, the snippet also give away information about column names and data types. **This is dummy data generated randomly so data and result may differ for each student.**

Companies

ID [PK] integer	Name text	Country text
1	Alpha	USA
2	Beta	NL
3	Gamma	nl
4	Delta	UK
5	Eta	NI
6	Zeta	UK
7	Unknown	[null]

Customers

ID [PK] integer	FirstName text	LastName text
9	Kathleen	Casebourne
10	Joep	Edgar
3	Johannah	Glenn
5	Glenn	Inez
2	Edgar	Inez

Products

ID [PK] integer	Name text	Price numeric	Expiry date	CompanyID integer
4	Bread - ...	3.9	2022-11-09	3
11	Juice - ...	10.1	2022-11-30	4
12	Oil - Tru...	13.2	2022-02-17	4
5	Truffle ...	13.3	2022-10-26	2
13	Cinna...	16.1	2022-09-06	1
9	Chicke...	24.3	2022-09-20	1
7	Chocol	34.9	2022-11-19	1

Orders

ID [PK] integer	CustomerID integer	dateTime timestamp with time zone	isOnline boolean
6	2	2022-12-04 15:35:57...	false
7	2	2022-12-04 15:35:57...	false
8	2	2022-12-04 15:35:57...	false
9	2	2022-12-04 15:35:57...	false
10	2	2022-12-04 15:35:57...	true
11	3	2022-12-04 15:35:57...	true
12	3	2022-12-04 15:35:57...	false

ShoppingCarts (Order Details)

OrderID [PK] integer	ProductID [PK] integer	Quantity integer
3	15	2
4	3	1
5	11	2
5	13	4
5	15	1
6	1	2
6	2	3

Exercise: 1: Find customer(s) whose part of FirstName or LastName is (John). List down all information of such customer [10 Points]

You are required to implement the following method in your hr1234.cs file

```
public static void Q1(ExamContext db, string Name)
```

Sample Result:

ID: 1, FirstName: Joep, LastName:Johannes

ID: 3, FirstName: Johannah, LastName:Glenn

Exercise: 2: Find information for given Product ID, the information should include Company Name, Product Name and Price. *Use of reference navigation properties is strictly prohibited for all exercises.* [15 Points]

You are required to implement the following method in your hr1234.cs file

```
public static void Q2(ExamContext db, int ProductID)
```

Sample Result:

Company : Delta, Prodcut: Juice - Pineapple, Price: 10.1

Exercise 3. List down country name, and total number of companies per country, along with the company info (Id, Name and Country of the companies for each country). [15 Points]

Don't forget: the country names could be upper, lower or mixed case and some companies might be missing this information.

You are required to implement the following method in your hr1234.cs file

```
public static void Q3(ExamContext db)
```

Sample Result:

```
NL, 3
5, Eta, Nl
2, Beta, NL
3, Gamma, nl
NULL, 1
7, Unknown,
UK, 2
4, Delta, UK
6, Zeta, UK
USA, 1
1, Alpha, USA
```

Exercise: 4: Create a complete bill for a given order, include customer name, ordered, date, total and order details, each product name, quantity, unit price and total price [15 Points]

You are required to implement the following method in your hr1234.cs file

```
public static void Q4(ExamContext db, int OrderID)
```

Sample Result:

```
Customer : Joep Johannes
OrderID: 1, Date: 04/12/2022 14:35:57
Beans - Fava, Canned, 54.3 x 1 = 54.3
Yogurt - Plain, 82.7 x 4 = 330.8
Grand total: 385.1
```

Exercise 5: List down unsold products, an unsold product is the one which never appear in any order/shoppingcart. **[15 Points]**

You are required to implement the following method in your hr1234.cs file

```
public static void Q5(ExamContext db)
```

Sample Result:

```
Product:18, Beans - Fava, Canned, 54.3
```

Exercise 6: Add new customer John Doe, place an order for him for any two random/arbitrary products. **[10 Points]**

You are required to implement the following method in your hr1234.cs file

```
public static void Q6 (ExamContext db)
```

Sample Output: (returned from db.SaveChanges)

```
4 records got created
```

Exercise 7: Increase the price of all products of companies from given country by given fraction. **[10 Points]**

You are required to implement the following method in your hr1234.cs file

```
public static void Q7 (ExamContext db, string Country, decimal fraction)
e.g hr1234.Q7(db, "NL", 0.25m); should increase the price of
all products from Dutch companies by 25%, i.e the new price
= 1.25* old price.
```

Sample Output: (returned from db.SaveChanges)

```
11 records got updated
```

Exercise 6: Delete an order and for a given OrderID, give feedback if the order was deleted or not. **[10 Points]**

You are required to implement the following method in your hr1234.cs file

```
public static void Q8(ExamContext db, int OrderID)
```

Sample Output: (returned from db.SaveChanges)

```
3 records got deleted
```

```
Order 100, from Customer 300 at 07/12/2022 13:28:21 deleted
OR
```

```
Order 100 not found
```