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Proiect Baze de Date2

Aplicatie pentru evidenta vanzarilor de masini intr-un dealership auto

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Tema

Tema abordata este reprezentata de o aplicatie pentru evidenta vanzarilor de masini intr-un dealership auto cu ajutorul limbajului de programare Python pentru implementarea GUI si a conexiunii cu baza de date construita folosind T-SQL cu MSSQL.

Baza de date

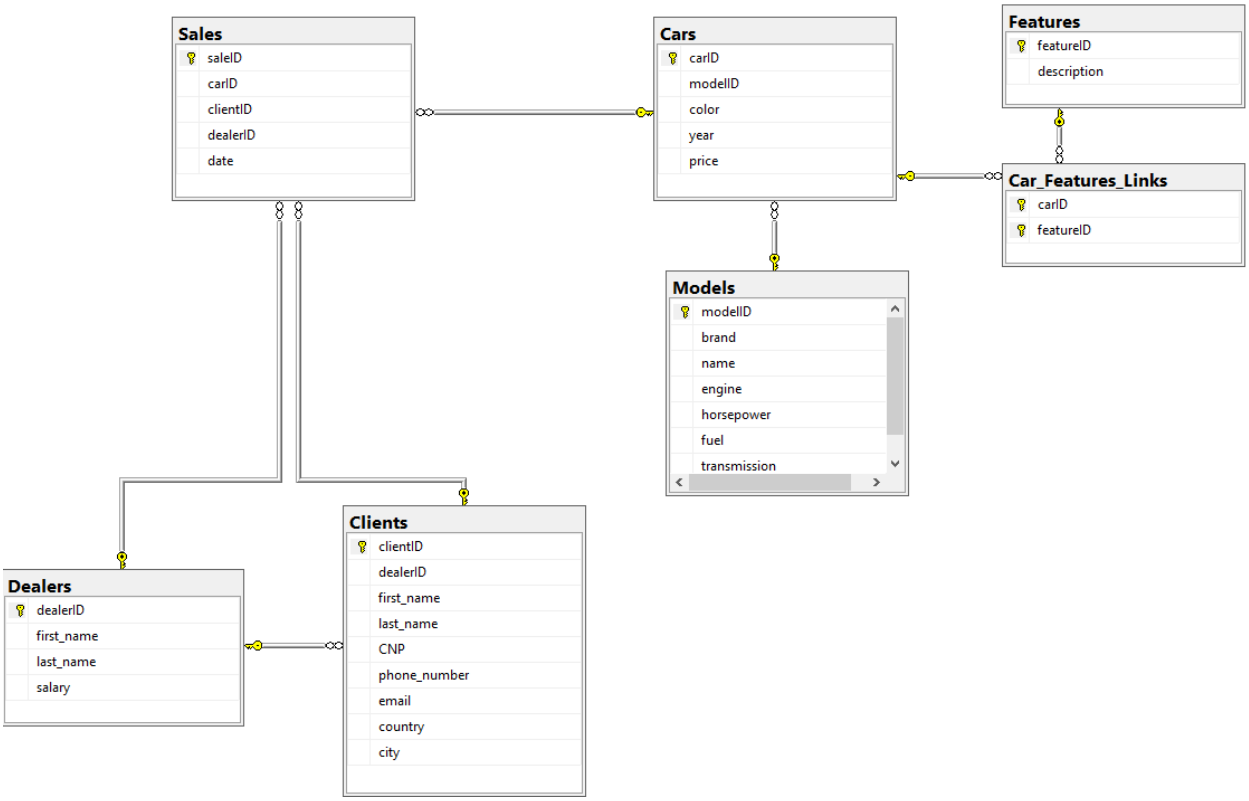

Figure 1 Diagrama Baza de Date

Relatii

1-M : Dealers-Clients, Models-Cars, Dealers-Sales

M-M: Cars-Features, Cars-Dealers, Cars-Clients

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Tabele si Constrangeri

Clients

	Column Name	Data Type	Allow Nulls
🔑	clientID	int	☐
	dealerID	int	☑
	first_name	nvarchar(50)	☐
	last_name	nvarchar(50)	☐
	CNP	nvarchar(13)	☐
	phone_numb...	nvarchar(10)	☐
	email	nvarchar(50)	☐
	country	nvarchar(50)	☐
	city	nvarchar(50)	☐

Tabelul stochează informații despre clienții care au cumpărat mașini, fiecare avand asignat cate un dealer.

Primary Key: ClientID

Foreign Key: DealerID

Constrangeri Unique: CNP, phone_number

Dealers

	Column Name	Data Type	Allow Nulls
🔑	dealerID	int	☐
	first_name	nvarchar(50)	☐
	last_name	nvarchar(50)	☐
	salary	decimal(10, 2)	☐

Tabelul stochează informații despre dealerii angajati in dealership.

Primary Key: DealerID

Constrangeri: Salariu > 1400

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Models

	Column Name	Data Type	Allow Nulls
🔑	modelID	int	☐
	brand	nvarchar(50)	☐
	name	nvarchar(50)	☐
	engine	nvarchar(50)	☐
	horsepower	int	☐
	fuel	nvarchar(50)	☐
	transmission	nvarchar(50)	☐

Tabelul stocheaza modelele de masini detinute de dealership

Primary Key: modelID

Constrangeri: Horsepower > 0

Cars

	Column Name	Data Type	Allow Nulls
🔑	carID	int	☐
	modelID	int	☑
	color	nvarchar(50)	☐
	year	int	☐
	price	decimal(10, 2)	☐

Tabelul stocheaza informatii despre masinile din dealership.

Primary Key: carID

Foreign Key: modelIF

Constrangeri: year > 0, price > 0

Features

	Column Name	Data Type	Allow Nulls
🔑	featureID	int	☐
	description	nvarchar(50)	☐

Tabelul stocheaza dotarile pe care le pot avea masinile din dealership

Primary Key: featureID

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Sales *

	Column Name	Data Type	Allow Nulls
🔑	saleID	int	☐
	carID	int	☑
	clientID	int	☑
	dealerID	int	☑
	date	date	☐

Tabelul stochează informații despre vânzările de mașini.

Primary Key: saleID

Foreign Key: carID, clientID, dealerID

Car_Features_Links

	Column Name	Data Type	Allow Nulls
🔑	carID	int	☐
🔑	featureID	int	☐

Tabel aditional care face conexiunea de M:M dintre Cars si Features.

Primary Key: compus din carID & featureID

Triggere

- dealer_salary_trigger: nu permite inserarea/actualizarea unui salariu sub 1400
- model_horsepower_trigger: nu permite inserarea/actualizarea puterii motorului sub 0
- ion_tiriac_trigger: nu permite stergerea dealerului Ion Tiriac (din motive evidente)

Proceduri

- sales_over_half_mil: afiseaza tara in care s-au facut vanzari de peste jumate de milion
- sales_in_city: primeste ca parametru un oras in functie de care se va returna cel mai vandut model de masina din orasul respectiv, alaturi de numarul de vanzari
- top_dealers: afiseaza toti dealerii care au vandut masini cu pretul mai mare decat media preturilor masinilor vandute in Romania
- sales_by_year: afiseaza suma vanzarilor in fieare an ordonate crescator dupa an
- show_cities: afiseaza toate orasele din tabela Clients
- sales_by_country: afiseaza pentru fiecare tara suma vanzarilor
- sales_by_dealer: afiseaza pentru fiecare dealer suma vanzarilor

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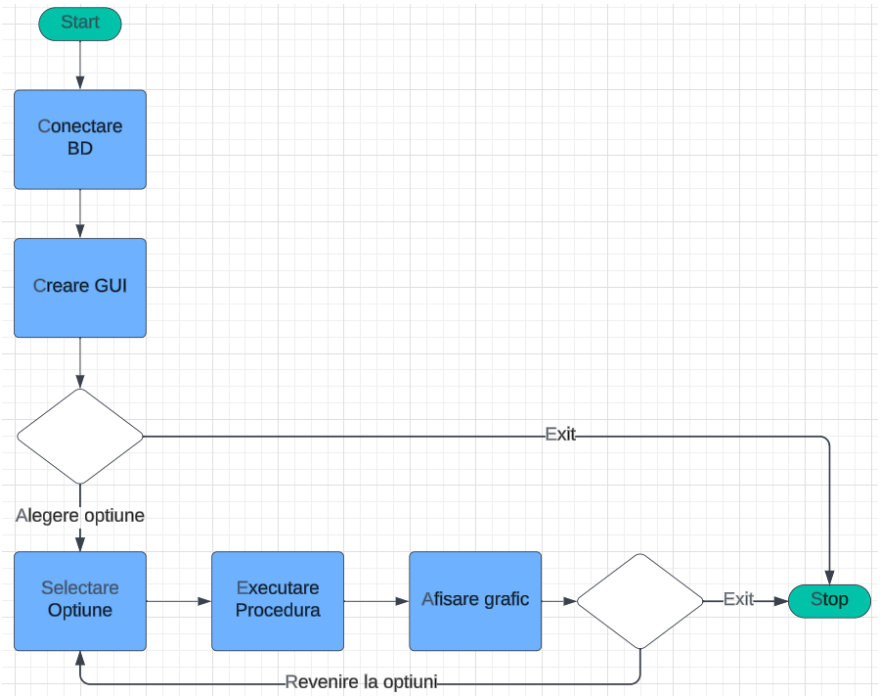
Workflow & Stari



Clasele Aplicatiei

MSSQLConnection

- __init__(self, host, port, database, username, password)
- openConnection() deschide conexiunea la baza de date
- closeConnection() inchide conexiunea la baza de date
- execProc(proc_name) executa procedura data prin param. “proc_name” ca string

MainWindow

- __init__() initializeaza GUI
- on_button_clicked(combo, db) afiseaza o analiza grafica in functie de optiunea activa in “combo”

Modul de conectare la baza de date se face ca in exemplul dat in laboratorul 9 (OCW) printr-un string de conectare, folosind metodele clasei MSSQLConnection. Parametrii din string sunt initializati in __init__.

```
pyodbc.connect(
                'DRIVER={ODBC Driver 17 for SQL Server};'
                f'SERVER={self.host},{self.port};'
                f'DATABASE={self.database};'
```

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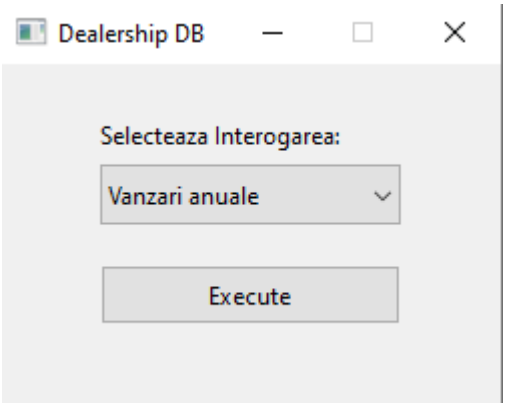
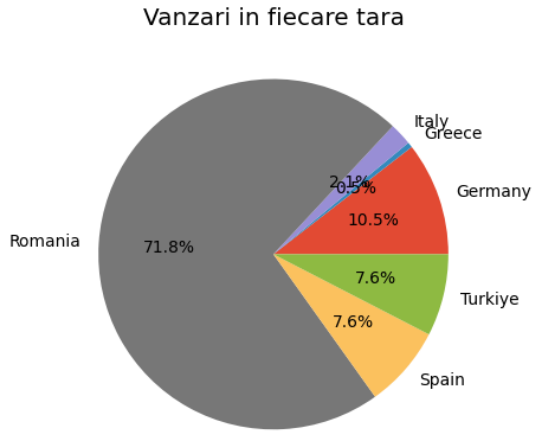
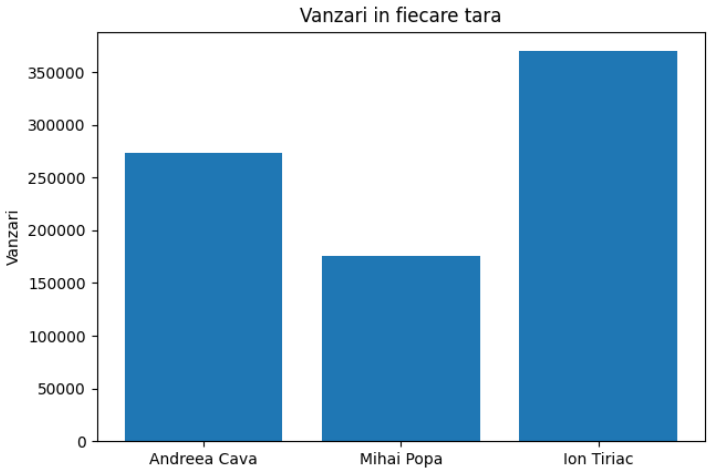
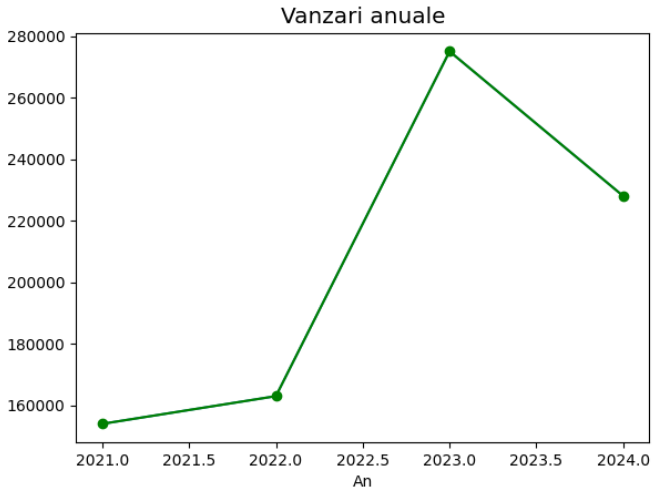
```
                'UID='+self.username+';'
                'PWD='+self.password+';')
```

Elemente grafice









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Concluzii

Aplicatia functioneaza corect si respecta cerintele impuse, chemand proceduri stocate din baza de date, in urma conexiunii, pentru a afisa rezultatele dorite.

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