

## MEDII DE PROIECTARE SI PROGRAMARE – LABORATOR 1

### 1. Calculul unei resurse (stoc) la momentul curent

Vom considera ca resursa stocul de materiale dintr-o societate ce efectueaza lucrari.

Pas 1 Schema bazei de date:

Tabele ce descriu intrari de resurse (materiale)

Facturi (IdFactura, NrFactura, DataFactura, IdFurnizor)

FacturiContinut (IdFactura, Nrc, IdMaterial, Cantitate, PretAchizitie)

Facturi	
Field Name	Data Type
IdF	AutoNumber
NrF	Number
DataF	Date/Time
IdFurnizor	Number

Facturi			
IdF	NrF	DataF	IdFurnizor
1	100	01.11.2017	1
2	200	10.11.2017	2
3	300	20.11.2017	3

FacturiContinut	
Field Name	Data Type
IdF	Number
Nrc	Number
IdMaterial	Number
Cantitate	Currency
PretIntrare	Currency

FacturiContinut					
IdF	Nrc	IdMaterial	Cantitate	PretIntrare	
1	1	1	10,00	2,00 lei	
1	2	2	5,00	3,00 lei	
1	3	4	20,00	4,00 lei	
2	1	5	30,00	5,00 lei	
2	2	1	5,00	2,00 lei	
3	1	4	6,00	4,00 lei	
3	2	2	8,00	3,00 lei	

Tabele ce descriu iesiri de resurse (materiale)

BonuriConsum ( IdBonConsum, NrBonConsum, DataBonConsum, IdLucrare)

BonuriConsumContinut(IdBonConsum, NrCrt, IdMaterial,Cantitate, Pret)

BonuriConsum	
Field Name	Data Type
IdBonConsum	AutoNumber
NrBonConsum	Number
DataBonConsum	Date/Time
IdLucrare	Number

BonuriConsum			
IdBonConsum	NrBonConsum	DataBonConsum	IdLucrare
22	1001	02.11.2017	1
23	1002	07.11.2017	2
24	1003	07.11.2017	2
25	1004	12.11.2017	2
26	1005	20.11.2017	2
27	1006	04.12.2017	1
28	1007	05.12.2017	2
29	1008	10.12.2017	2
30	1009	11.12.2017	1

BonuriConsumContinut	
Field Name	Data Type
IdBonConsum	Number
NrCrt	Number
IdMaterial	Number
Cantitate	Currency
Pret	Currency

BonuriConsumContinut					
IdBonConsum	NrCrt	IdMaterial	Cantitate	Pret	
22	1	1	2,00	2,00 lei	
22	2	2	3,00	3,00 lei	
22	3	4	2,00	5,00 lei	
23	1	2	2,00	3,00 lei	
23	2	3	4,00	4,00 lei	
24	1	2	2,00	3,00 lei	
24	2	1	4,00	2,00 lei	
25	1	2	2,00	3,00 lei	
25	2	3	5,00	4,00 lei	
26	1	3	5,00	4,00 lei	
26	2	5	4,00	6,00 lei	
27	1	3	2,00	4,00 lei	
28	1	4	6,00	5,00 lei	
28	2	5	10,00	6,00 lei	
29	1	4	10,00	5,00 lei	
29	2	3	5,00	4,00 lei	
29	3	1	2,00	2,00 lei	
30	1	1	10,00	2,00 lei	
30	2	2	20,00	3,00 lei	
30	3	3	3,00	4,00 lei	
30	4	4	4,00	5,00 lei	

Tabela ce descrie starea initiala a resursei:  
 StocInitial(Data, IdMaterial, Cantitate, Pret)

StocInitial		StocInitial			
Field Name	Data Type	Data	IdMaterial	Cantitate	Pret
Data	Date/Time	01.11.2017	1	30,00	2,00 lei
IdMaterial	Number	01.11.2017	2	20,00	3,00 lei
Cantitate	Currency	01.11.2017	3	25,00	3,00 lei
Pret	Currency				

Tabela ce descrie tipurile de resurse:  
 Materiale(IdMaterial, DMaterial, UM, Pret)

Materiale		Materiale			
Field Name	Data Type	IdMaterial	DMaterial	UM	Pret
IdMaterial	AutoNumber	1	Material 1	Kg	2,00 lei
DMaterial	Text	2	Material 2	Buc	3,00 lei
UM	Text	3	Material 3	M	4,00 lei
Pret	Currency	4	Material 4	Kg	5,00 lei
		5	Material 5	Buc	6,00 lei

Tabele ce descriu agenti, entitati ce pot afecta resursele:  
 Lucrari(IdLucrare, DLucrare)  
 Furnizori(IdFurnizor, DFurnizor)

Lucrari		Lucrari	
Field Name	Data Type	IdLucrare	DLucrare
IdLucrare	AutoNumber	1	Lucrare 1
DLucrare	Text	2	Lucrare 2
		3	Lucrare 3

Furnizori		Furnizori	
Field Name	Data Type	IdFurnizor	DFurnizor
IdFurnizor	AutoNumber	1	Furnizor 1
DFurnizor	Text	2	Furnizor 2
		3	Furnizor 3
		4	Furnizor 4

Alte tabele  
 Operatii(IdOperatie, DOperatie)

Operatii		Operatii	
Field Name	Data Type	IdOperatie	DOperatie
IdOperatie	Number	1	Stoc Initial
DOperatie	Text	2	Intrari
		3	Consumuri
		4	Stoc Final

Tabele ce descriu starea curenta a resursei (se calculeaza )  
 Stoc (IdMaterial, Cantitate)  
 BalantaStoc(IdMaterial, StocInitial, Intrari, Consumuri, StocFinal)

Stoc		BalantaStoc	
Field Name	Data Type	Field Name	Data Type
IdMaterial	Number	IdMaterial	Number
Cantitate	Currency	StocInitial	Currency
		Intrari	Currency
		Consumuri	Currency
		StocFinal	Currency

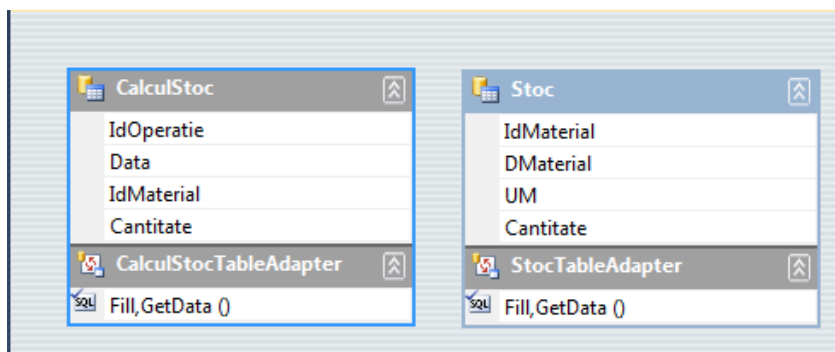
Tabela de manevra, necesara calculului stocului:  
 CalculStoc (IdOperatie, Data, IdMaterial, Cantitate)

CalculStoc	
Field Name	Data Type
IdOperatie	Number
Data	Date/Time
IdMaterial	Number
Cantitate	Currency

Observatii:

1. Tabelele CalculStoc si StocInitial nu au cheie.

Pas 2. Proiectarea DataSet-ului



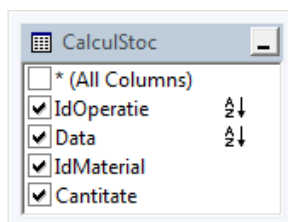
#### Cererea SQL pt. StocTableAdapter :

```
SELECT Stoc.IdMaterial, Materiale.DMaterial, Materiale.UM, Stoc.Cantitate
FROM (Stoc LEFT OUTER JOIN
      Materiale ON Stoc.IdMaterial = Materiale.IdMaterial)
ORDER BY Materiale.DMaterial
```

Column	Alias	Table	Outp...	Sort Type	Sort Order
IdMaterial		Stoc	<input checked="" type="checkbox"/>		
DMaterial		Materiale	<input checked="" type="checkbox"/>	Ascending	1
UM		Materiale	<input checked="" type="checkbox"/>		
Cantitate		Stoc	<input checked="" type="checkbox"/>		

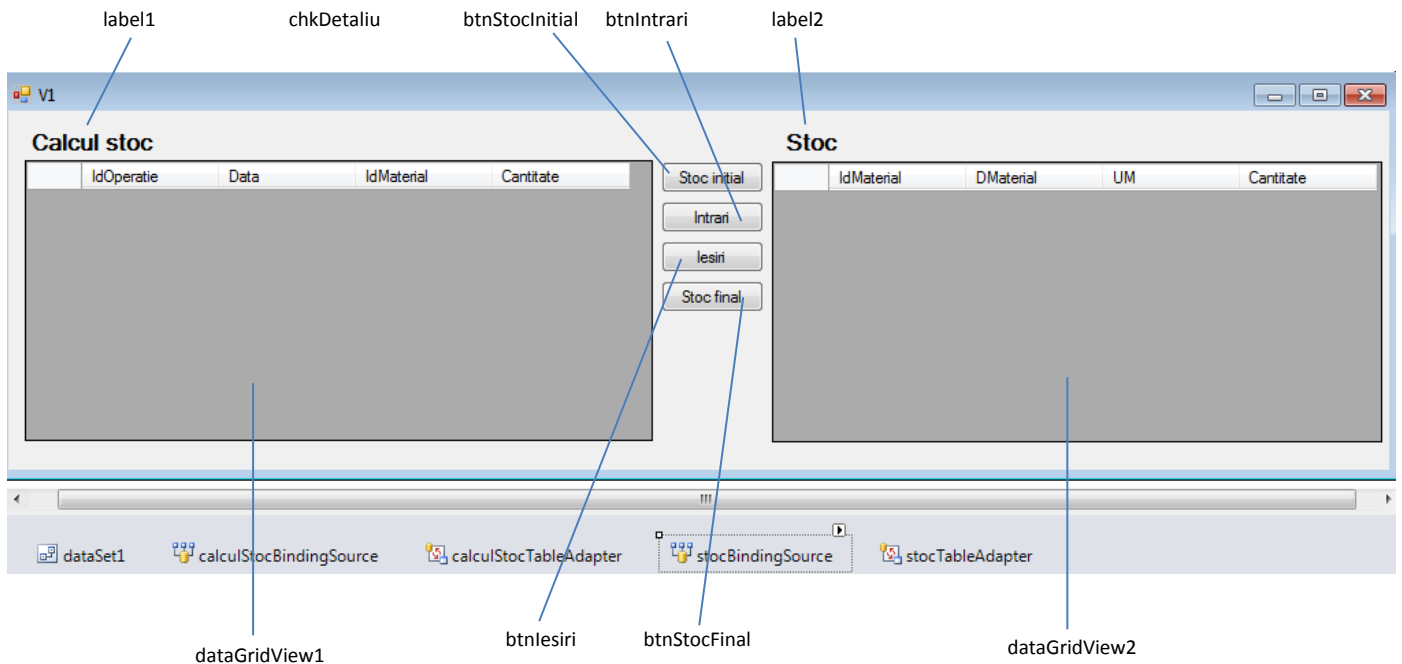
#### Cererea SQL pt. calculStocTableAdapter :

```
SELECT IdOperatie, Data, IdMaterial, Cantitate
FROM CalculStoc
ORDER BY IdOperatie, Data
```



Column	Alias	Table	Outp...	Sort Type	Sort Order
IdOperatie		CalculStoc	<input checked="" type="checkbox"/>	Ascending	1
Data		CalculStoc	<input checked="" type="checkbox"/>	Ascending	2
IdMaterial		CalculStoc	<input checked="" type="checkbox"/>		
Cantitate		CalculStoc	<input checked="" type="checkbox"/>		

### Pas 3. Proiectarea form-ului



## Pas 4. Implementare

Resurse necesare:

```
using System.Data.OleDb;
```

### Variabile locale clasei Form1:

```
private OleDbConnection con = new OleDbConnection();  
private OleDbCommand cmd = new OleDbCommand();
```

Metode eveniment:

```
private void V1_Load(object sender, EventArgs e) {

    //Configurăm obiectele conexiune și comanda
    con.ConnectionString = calculStocTableAdapter.Connection.ConnectionString;
    cmd.Connection = con;

    //Șterg conținutul tabelului CalculStoc și Stoc
    con.Open();
    cmd.CommandText = "Delete * from CalculStoc";
    cmd.ExecuteNonQuery();

    cmd.CommandText = "Delete * from Stoc";
    cmd.ExecuteNonQuery();

    con.Close();

    this.calculStocTableAdapter.Fill(this.dataSet1.CalculStoc);
    this.stocTableAdapter.Fill(this.dataSet1.Stoc);
}

private void btnStocInitial_Click(object sender, EventArgs e) {

    con.Open();

    //Stoc Initial
    cmd.CommandText = "Insert into CalculStoc(IdOperatie, Data, IdMaterial, Cantitate) " +
```

```

                "Select 1,Data, IdMaterial, Cantitate " +
                "From StocInitial";

try { cmd.ExecuteNonQuery(); }
catch (Exception ex) { MessageBox.Show(ex.Message); }
con.Close();

//Incarc dataTable-ul CalculStoc
dataSet1.CalculStoc.Clear();
calculStocTableAdapter.Fill(this.dataSet1.CalculStoc);
}

private void btnIntrari_Click(object sender, EventArgs e) {
    // Intrari
    con.Open();

    cmd.CommandText = "Insert into CalculStoc(IdOperatie, Data, IdMaterial, Cantitate) " +
        "Select 2,DataF as Data, IdMaterial, Cantitate " +
        "From Facturi RIGHT JOIN FacturiContinut ON Facturi.IdF = FacturiContinut.IdF ";
    try { cmd.ExecuteNonQuery(); }
    catch (Exception ex) { MessageBox.Show(ex.Message); }
    con.Close();

    //Incarc dataTable-ul CalculStoc
    dataSet1.CalculStoc.Clear();
    calculStocTableAdapter.Fill(this.dataSet1.CalculStoc);
}

private void btnIesiri_Click(object sender, EventArgs e) {
    //Iesiri
    con.Open();
    cmd.CommandText = "Insert into CalculStoc(IdOperatie, Data, IdMaterial, Cantitate) " +
        "Select 3,DataBonConsum as Data, IdMaterial, -Cantitate " +
        "From BonuriConsum RIGHT JOIN BonuriConsumContinut " +
        "ON BonuriConsum.IdBonConsum = BonuriConsumContinut.IdBonConsum ";
    try { cmd.ExecuteNonQuery(); }
    catch (Exception ex) { MessageBox.Show(ex.Message); }
    con.Close();

    //Incarc dataTable-ul CalculStoc
    dataSet1.CalculStoc.Clear();
    calculStocTableAdapter.Fill(this.dataSet1.CalculStoc);
}

private void btnStocFinal_Click(object sender, EventArgs e) {
    con.Open();

    // Calculez totaluri pe Cantitate si grupez pe IdProdus
    // inserez rezultatul in tabela Stoc
    cmd.CommandText = "INSERT INTO Stoc ( IdMaterial, Cantitate ) " +
        "SELECT IdMaterial, Sum(CalculStoc.Cantitate) AS Cantitate " +
        "FROM CalculStoc GROUP BY CalculStoc.IdMaterial";
    cmd.ExecuteNonQuery();

    //Stoc final

    cmd.CommandText = "INSERT INTO CalculStoc ( IdOperatie, IdMaterial, Cantitate, Data ) " +
        "SELECT 4,CalculStoc.IdMaterial, Sum(CalculStoc.Cantitate) AS Cantitate, now() " +
        "FROM CalculStoc GROUP BY CalculStoc.IdMaterial";
    cmd.ExecuteNonQuery();

    con.Close();

    //Incarc dataTable-ul CalculStoc si Stoc
    dataSet1.CalculStoc.Clear();
    calculStocTableAdapter.Fill(this.dataSet1.CalculStoc);

    dataSet1.Stoc.Clear();

```

```

    stocTableAdapter.Fill(this.dataSet1.Stoc);
}

```

## Executie:

### 1. Initial

The application window V1 displays two main sections: 'Calcul stoc' and 'Stoc'. Both sections contain empty tables. The 'Calcul stoc' table has columns: IdOperatie, Data, IdMaterial, and Cantitate. The 'Stoc' table has columns: IdMaterial, DMaterial, UM, and Cantitate. Between the tables are four buttons: 'Stoc initial', 'Intrari', 'Iesiri', and 'Stoc final'.

### 2. Dupa click pe butonul Stoc initial

After clicking the 'Stoc initial' button, the 'Calcul stoc' table is populated with the following data:

	IdOperatie	Data	IdMaterial	Cantitate
▶	1	2/1/2020	3	25
	1	2/1/2020	2	20
	1	2/1/2020	1	30

The 'Stoc' table remains empty. The buttons 'Intrari', 'Iesiri', and 'Stoc final' are still visible.

### 3. Dupa click pe butonul Intrari

After clicking the 'Intrari' button, the 'Calcul stoc' table is updated with the following data:

	IdOperatie	Data	IdMaterial	Cantitate
▶	1	2/1/2020	3	25
	1	2/1/2020	2	20
	1	2/1/2020	1	30
	2	2/1/2020	4	20
	2	2/1/2020	2	5
	2	2/1/2020	1	10
	2	2/3/2020	1	5
	2	2/3/2020	5	20

The 'Stoc' table remains empty. The buttons 'Stoc initial', 'Iesiri', and 'Stoc final' are still visible.

### 4. Dupa click pe butonul Iesiri

V1

### Calcul stoc

	IdOperatie	Data	IdMaterial	Cantitate
	2	2/5/2020	4	6
	2	2/5/2020	2	8
	3	2/6/2020	1	-2
	3	2/6/2020	2	-3
	3	2/6/2020	4	-2
	3	2/7/2020	1	-4
	3	2/7/2020	2	-2
	2	2/7/2020	2	4

Stoc initial

Intrari

**Iesiri**

Stoc final

### Stoc

	IdMaterial	DMaterial	UM	Cantitate
--	------------	-----------	----	-----------

5. Dupa click pe butonul Stoc final

V1

### Calcul stoc

	IdOperatie	Data	IdMaterial	Cantitate
	3	2/12/2020	2	-2
	3	2/13/2020	3	-5
	3	2/13/2020	5	-4
	3	2/14/2020	3	-2
	4	2/16/2020 9:40 ...	5	16
	4	2/16/2020 9:40 ...	1	27
	4	2/16/2020 9:40 ...	2	4
	4	2/16/2020 9:40 ...	2	1

Stoc initial

Intrari

Iesiri

**Stoc final**

### Stoc

	IdMaterial	DMaterial	UM	Cantitate
	1	Material 1	Kg	27
	2	Material 2	Buc	4
	3	Material 3	M	1
	4	Material 4	Kg	4
	5	Material 5	Buc	16

## Teme

1. Implementati aplicatia data
2. Realizati un form care afiseaza doar stocul calculat (contine doar un singur grid - Stoc)
3. Realizati un form care sa contina doua grid-uri Calcul stoc si Stoc, fara butoane, dar care sa filtreze Calcul stoc cu id-ul materialului curent din Stoc.
4. Aplicati modelul prezentat (varianta 1 sau 3) pt. resursele financiare ale unei persoane