LABORATORY WORK 1. LEARN ESSENTIALS OF WORK WITH DBMS ACCESS

I. Problem description

Some enterprise purchases products from various suppliers (both legal entities and individual entrepreneurs). Purchasing is performed using batches and formalized as supply contracts. Each supply contract has a unique number and might be concluded with a single supplier. Documents for each contract include product name, supplied amount, and price (in UAH).

Database with the following tables might be used to store and process such information using DBMS Access.

1. “Suppliers” table

Field name	Data type	Field size	Description
SupplierName	Text	50	Supplier name
SupplierID	Number	Integer	Supplier ID
Note	Memo		Note

2. “LegalEntities” table

Field name	Data type	Field size	Description
SupplierID	Number	Integer	Supplier ID
TaxNumber	Text	20	Tax number
VATNumber	Text	20	VAT certificate number

3. “IndividualEntrepreneurs” table

Field name	Data type	Field size	Description
SupplierID	Number	Integer	Supplier ID
LastName	Text	20	Last name
FirstName	Text	20	First name
SecondName	Text	20	Second name
RegistrationNumber	Text	20	Registration certificate number

4. “Contracts” table

Field name	Data type	Field size	Description
ContractNumber	Number	Integer	Contract number
ContractDate	Date/Time	Short Date	Contract conclusion date
SupplierID	Number	Integer	Supplier ID
ContractName	Text	50	Contract name
Comment	Memo		Note

5. “Supplied” table

Field name	Data type	Field size	Description
ContractNumber	Number	Integer	Contract number
Product	Text	50	Product name
Amount	Number	Long Integer	Batch size (items)
PricePerItem	Number	Single with 2 decimal places	Price per item (in UAH)

II. Implementation steps

1. Create a working directory (e.g., D:\ACCLAB).
2. Run DBMS Access.
3. Create a new database with the name “sk.mdb”.
4. If the database was created earlier – open it.
5. Create database tables according to the structure outlined above.

To create each table:

1) Click “Create”;
2) Select “Table” and enable design view;

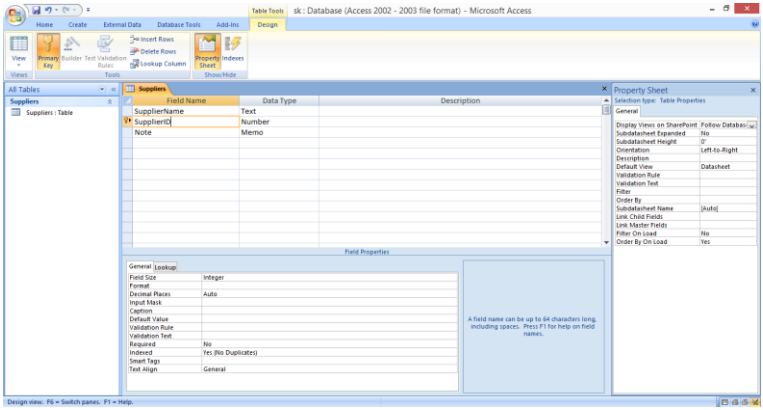

Figure 1.1 – Table design view

3) Type table name and then input table structure information (from problem description section);

4) Input primary key (Pk) information. To make the field primary select it and click “Primary Key”. Attention! Hence, PK might include only a single field!

5) For the table “Suppliers” include the field “SupplierID” into the PK (figure 1.1);

6) For the tables “LegalEntities” and “IndividualEntrepreneurs” include the field “SupplierID” into the PK;

7) For the table “Contracts” include the field “ContractNumber” into the PK;

8) For the table “Supplied” include the field “ContractNumber” into the PK. Unlike the other tables, this table requires a composite primary key that will allow controlling unique pair of contract number and product name. Therefore, the field “Product” should be included in the PK. For this click “Indexes” and add the “Product” field into the “PrimaryKey” index (figure 1.2);

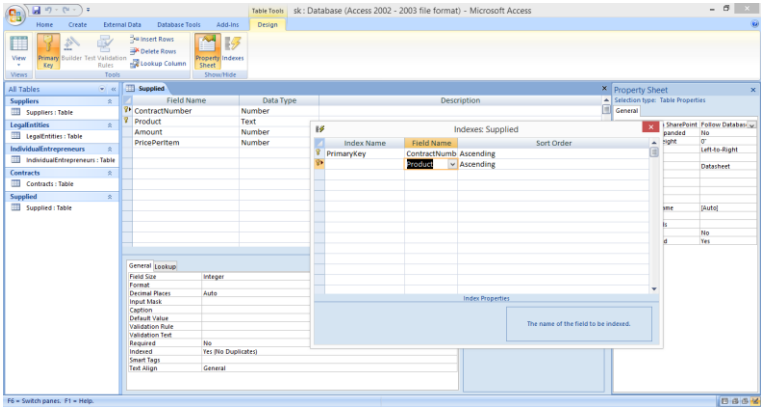

Figure 1.2 – Keys and indices settings

9) Save created table for which close the design tab.

6. Create relationships between tables for which:

1) Open the “Database Tools” tab;

2) Click “Relationships”;

3) Add all created tables to the data scheme;

4) Drag the field “ContractNumber” of the table “Contracts” to the field “ContractNumber” of the table “Supplied”. As the result, a relationship between tables will appear (figure 1.3);

5) In the same way create a relationship between the field ‘SupplierID” of the table “Suppliers” and the field “SupplierID” of the table “Contracts”;

6) Create a relationship between the field “SupplierID” of the table “Suppliers” and the fields “SupplierID” of the tables “LegalEntities” and “IndividualEntrepreneurs”;

7) Double click on each relationship between database tables and check “Enforce Referential Integrity” (figure 1.4);

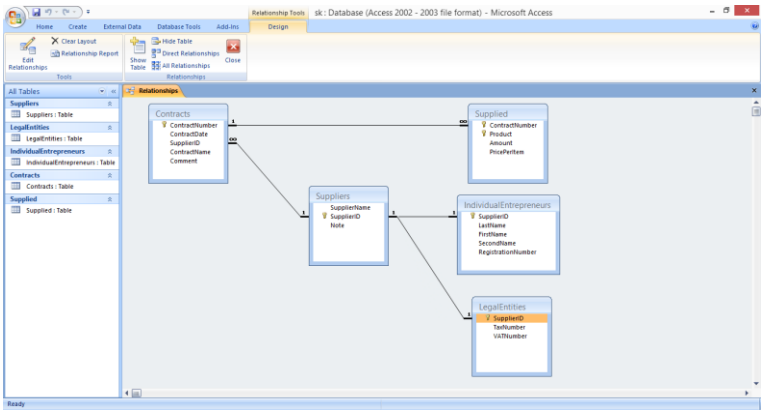

Figure 1.3 – Database schema view

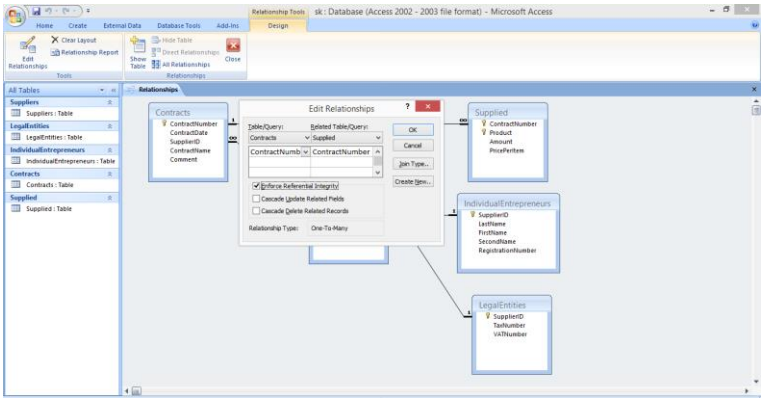

Figure 1.4 – Relationships settings

8) Save changes and close the “Relationships” tab.

7. Enter data into tables for which right-click on table and choose “Open”. In case of any trouble check “Tips and tricks” below.

Tables should contain the following information:

Attention! Data in the field “Note” of the table “Suppliers” and data in the field “ContractName” of the table “Contracts” are single-line strings!

Table “Suppliers”

SupplierName	SupplierID	Note
Petrov P. P. PE	3	Kharkiv, Nauky Av., 55, office 108, tel. 32-18-44
“Interfrut” LLC	2	Kyiv, Peremohy Av., 154, office 3
Ivanov I. I. PE	1	Kharkiv, Pushkinska Str., 77 (tel. 33-33-44, 12-34-56, fax 22-12-33)
“Transservis” LLC	4	Odesa, Deribasivska Str., 75
Sidorov S. S. PE	5	Poltava, Svobody Str., 15, apt. 43

Table “LegalEntities”

SupplierID	TaxNumber	VATNumber
2	00123987	19848521
4	29345678	25912578

Table “IndividualEntrepreneurs”

SupplierID	LastName	FirstName	SecondName	RegistrationNumber
1	Ivanov	Illia	Illich	00123987
3	Petrov	Pavlo	Petrovych	12345678
5	Sidorov	Serhii	Stepanovych	09876541

Attention!

Date representation format in DBMS Access corresponds to the Windows system format. To check and modify the date representation format change your system date/time configuration in “Time and language” settings.

Table “Contracts” (Attention! Dates are shown in the U.S. format)

ContractNumber	ContractDate	SupplierID	ContractName	Comment
1	9/1/1999	1	Contract 1	Invoice 34 from 8/30/99
2	9/10/1999	1	Contract 2	Invoice 08-78 from 8/28/99
3	9/10/1999	3	Contract 3	Invoice 08-78 from 8/28/99
4	9/23/1999	3	Contract 4	Order 56 from 8/28/99
5	9/24/1999	2	Contract 5	Invoice 74 from 9/11/99
6	10/1/1999	1	Contract 6	Invoice 9-12 from 9/28/99
7	10/2/1999	2	Contract 7	Invoice 85 from 9/21/99

Table “Supplied”

ContractNumber	Product	Amount	PricePerItem
1	TV	10	1253.45
1	Audio Player	25	655.12
1	Video Player	12	722.33
2	Stereo System	11	511.43
2	Audio Player	5	455.14
2	Video Player	8	450.67
1	Stereo System	12	220.45
1	PC	24	1554.22
2	PC	43	1453.18
3	TV	52	899.99
3	Audio Player	11	544.00
3	Display	85	545.32
4	TV	56	990.56
4	Audio Player	22	323.19
4	Printer	41	350.77
5	TV	14	860.33
5	Audio Player	33	585.67

End of table “Supplied”

ContractNumber	Product	Amount	PricePerItem
5	Video Player	17	850.12
4	Stereo System	27	330.55
5	Display	44	590.23
6	TV	34	810.15
6	PC	32	1850.24
6	Display	51	520.95
7	TV	62	900.58
7	PC	15	1234.56
7	Display	22	389.75

Tips and tricks.

A. To add a new record into a table select the last empty row of the table. After the input is done leave this row and move to the next.

B. Right-click on the record and click “Delete Record” to remove it.

C. Use blocks of data while copy-pasting it to a database table.

8. Take a look at the referential integrity features. Make some delete/update operations in the related tables.

9. Save file “SK.mdb”.

Report requirements:

1) Briefly describe the main steps of this work;

2) Depict structure of the created database including tables’ relations;

3) Describe the referential integrity features that you analyzed.

Questions

1. Explain why the proposed database structure was selected to store information. Which shortcomings this database structure has?

2. Is it possible to change this database structure? How?

3. Briefly describe each DBMS Access data type.

4. What is the purpose of the “AutoNumber” field type? What are the advantages and disadvantages of this field type? Why it was not used to design database tables in this work?

5. How to create a database using DBMS Access?

6. How to modify a database created using DBMS Access (create a new table or change the structure of the existing table)?

7. How to add a new record into a table?

8. How to delete one or several records from a table?

9. How to sort data within a table by any field?

10. How to change the date representation format?

11. What is required to enable referential integrity between tables?

12. How to modify referential integrity type?

13. Advantages and disadvantages of the “Restrict” referential integrity.

14. Advantages and disadvantages of the “Cascade” referential integrity.

15. What is an index?

16. List basic index types.

17. List basic index functions.

18. What is a table primary key?

19. How to set up a primary key for a table?

20. How to create a composite primary key (this key contains several fields)?

21. How to make table field unique (do not allow to input repeating values)?

22. How to change fields order within a table structure?