Technical University of Moldova

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DB Laboratory 4

Submitted To:
Maria Cojanu
Asst. Univ.
Computer Science
Department

Submitted By :
Sezgin Erol
Group FAF-161
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General purpose:

Learn about SQL Query Language

Tasks:

- Answer Questions at the end of Chapter 4;
- Solve ex. 1 at the end of Chapter 4;
- Create SQL Queries onto database which name is "universitatea" to solve tasks according to the variant ;

Answers to Questions:

1. What features does SQL Transact-SQL Query Editor offer?
    - It lets us write sql queries and execute them specifying the desirable database.
    - provides user with autocomplete and error checking subroutine.
    - Built in Debugging system.
2. What do DDL, DML, DCL and TCL mean?
    - Data Definition Language consists of the SQL commands that can be used to define the database schema. It simply deals with descriptions of the database schema and is used to create and modify the structure of database objects in database.
    - DDL commands:
        - COMMENT
        - RENAME
        - ALTER
        - TRUNCATE
        - DROP
    - DML commands:
        - UPDATE

  - INSERT
  - SELECT
  - DELETE
- TCL commands:
  - SAVEPOINT
  - REVOKE
- DCL commands:
  - GRANT
  - ROLLBACK
  - COMMIT

3. Select instruction syntax:[2]

```
-- Syntax for SQL Server and Azure SQL Database

<SELECT statement> ::=
    [ WITH { [ XMLNAMESPACES ,] [ <common_table_expression> [,...n] ] } ]
    <query_expression>
    [ ORDER BY { order_by_expression | column_position [ ASC | DESC ] }
  [ ,...n ] ]
    [ <FOR Clause>]
    [ OPTION ( <query_hint> [ ,...n ] ) ]
<query_expression> ::=
    { <query_specification> | ( <query_expression> ) }
    [  { UNION [ ALL ] | EXCEPT | INTERSECT }
        <query_specification> | ( <query_expression> ) [...n ] ]
<query_specification> ::=
SELECT [ ALL | DISTINCT ]
    [TOP ( expression ) [PERCENT] [ WITH TIES ] ]
    < select_list >
    [ INTO new_table ]
    [ FROM { <table_source> } [ ,...n ] ]
    [ WHERE <search_condition> ]
    [ <GROUP BY> ]
    [ HAVING < search_condition > ]
```

Figure 1: Full Select instruction syntax for MSSQL

4. JOIN in MSSQL

- A JOIN clause is used to combine rows from two or more tables, based on a related column between them.

  Here are the different types of the JOINs in SQL:

  – (INNER) JOIN: Returns records that have matching values in both tables

  – LEFT (OUTER) JOIN: Return all records from the left table, and the matched records from the right table

  – RIGHT (OUTER) JOIN: Return all records from the right table, and the matched records from the left table

  – FULL (OUTER) JOIN: Return all records when there is a match in either left or right table

5. How to limit results from SQL queries:

   - The SELECT TOP clause is used to specify the number of records to return.

Task Realization:

	Id_Grupa	Cod_Grupa	Specialitate	Nume_Facultate
1	1	CIB171	Cibernetica	Informatica si Cibernetica
2	2	INF171	Informatica	Informatica si Cibernetica
3	3	TI171	Tehnologii Informationale	Informatica si Cibernetica

Figure 2: Aflafi toate datele despre grupele de studii de la facultate

	Id_Disciplina	Disciplina	Nr_ore_plan_disciplina
9	107	Baze de date	60
10	100	Sisteme de operare	60
11	101	Programarea calculatoarelor	60
12	116	Proiectarea sistemelor informatice	60
13	120	Programe aplicative	46
14	102	Informatica aplicata	46
15	103	Sisteme de calcul	46
16	106	Programarea WEB	46
17	111	Modelarea sistemelor	46
18	109	Retele informatice	46
19	114	Tehnologii de procesare a informatiei	46
20	115	Programarea declarativa	46
21	119	Integrare informationala europeana	20

Figure 3: Sa se obtina lista disciplinelor in ordine descrescatoare a numarului de ore.

Results Messages

	Id_Disciplina	Disciplina	Nume_Profesor	Prenume_Profesor
1	118	Practica de productie	Ungureanu	Iulia
2	100	Sisteme de operare	Popescu	Gabriel
3	103	Sisteme de calcul	Popescu	Gabriel
4	104	Asamblare si depanare PC	Popescu	Gabriel
5	110	Matematica discreta	Olteanu	Andrei
6	112	Limbaje evaluate de programare (Java,.NET)	Negru	Sergiu
7	118	Practica de productie	Nechita	Vasile
8	111	Modelarea sistemelor	Nazarie	Alexandru
9	102	Informatica aplicata	Munteanu	Alexandru
10	115	Programarea declarativa	Munteanu	Alexandru
11	101	Programarea calculatoarelor	Mocanu	Diana
12	106	Programarea WEB	Mocanu	Diana
13	113	Programarea aplicatiilor Windows	Mocanu	Diana
14	118	Practica de productie	Misan	Andrei
15	120	Programe aplicative	Mircea	Sorin
16	119	Integrare informationala europeana	Mircea	Maria
17	107	Baze de date	Micu	Elena
18	108	Structuri de date si algoritmi	Micu	Elena
19	114	Tehnologii de procesare a informatiei	Ilascu	Ionela
20	105	Cercetari operationale	Frent	Tudor
21	109	Retele informatice	Dogar	Alexandru
22	108	Structuri de date si algoritmi	Bivol	Ion
23	117	Practica de licenta	Bivol	Ion
24	116	Proiectarea sistemelor informatice	Avram	Sanda

Figure 4: Aflati cursurile (Disciplina) predate de fiecare profesor (NumeProfesor, PrenumeProfesor) sortate descrescator dupa nume apoi prenume.

	Id_Disciplina	Disciplina
1	101	Programarea calculatoarelor
2	104	Asamblare si depanare PC
3	105	Cercetari operationale
4	108	Structuri de date si algoritmi
5	112	Limbaje evaluate de programare (Java,.NET)
6	113	Programarea aplicatiilor Windows
7	114	Tehnologii de procesare a informatiei
8	115	Programarea declarativa
9	116	Proiectarea sistemelor informatice
10	118	Practica de productie
11	119	Integrare informationala europeana

Figure 5: Afi ati care dintre discipline au denumirea formata din mai mult de 20 de caractere?

	Id_Student	Nume_Student	Prenume_Student	Data_Nastere_Student	Adresa_Postala_Student
1	100	Brasovianu	Teodora	2000-11-24	mun. Chisinau, str. Tighina, 23/3
2	101	Cosovanu	Geanina	2000-08-04	mun. Chisinau, bd. Decebal, 76
3	107	Diaconu	Samuel	2000-12-25	or. Ungheni, str. Gh. Cristiuc, 10
4	118	Gheorghescu	Gabriel	2001-01-01	mun. Chisinau, bd. Moscova, 20
5	119	Ghimpu	Eduard	2000-01-21	mun. Chisinau, or. Cricova, str. Chisinaului, 84
6	137	Nicolescu	Aurel	1999-06-18	or. Leova, str.Stefan cel Mare, 50
7	138	Oncioiu	Costin-Ilie	1999-06-12	or. Leova, str. Stefan cel Mare, 67/1
8	150	Suciu	Ionut	2000-05-15	or. Anenii Noi, str. Concilierii Nationale, 2
9	151	Timu	Andrei	2001-08-10	or. Donduseni, str. S. Lazo, 16
10	152	Vacareanu	Stefan	2000-02-19	or. Donduseni, str. Comarov, 12
11	163	Lucaciu	Raul	2000-04-23	mun. Chi?inau, str. Uzinelor, 88
12	164	Lucaciu	Alexandru	1999-11-13	or. Ceadir-Lunga, str. Lenin, 54
13	165	Lucasu	Victor	2000-04-21	mun. Chisinau, str. Ismail, 33
14	166	Marcu	Daniel	2000-03-11	mun. Chisinau, str. M. Basarab, 5/1
15	172	Mazareanu	Sergiu	1995-02-23	mun. Chi?inau, str. Calea Orheiului, 107/1

Figure 6: Sa se afiseze lista studentilor al caror nume se termina in ,,u”

	Nume_Student	Prenume_Student
1	Damian	Roxana
2	Danci	Larisa
3	Gheorghescu	Gabriel
4	Popa	Mihaela
5	Varga	Izabella
6	Viman	Viorel
7	Timu	Andrei
8	Vacareanu	Stefan
9	Covas	Roman
10	Matko	Mihai
11	Marcu	Daniel

Figure 7: Afi ati numele i prenumele primilor 5 studenti, care au obtinut note in ordine descrescatoare la al doilea test de la disciplina Baze de date. Sa se foloseasca optiunea TOP ... WITH TIES.

	Cod_Grupa
1	CIB171
2	TI171

Figure 8: in ce grupa (CodGrupa) invata studentii care locuiesc pe strada 31 August?

	Id_Student	Nume_Student	Adresa_Postala_Student	Id_Disciplina
197	168	Martis	mun. Chisinau, bd. Mircea cel ...	119
198	169	Matko	mun. Chisinau, str. Maria Drag...	115
199	169	Matko	mun. Chisinau, str. Maria Drag...	118
200	170	Maxim	mun. Chisinau, bd. Dacia, 5/4	101
201	170	Maxim	mun. Chisinau, bd. Dacia, 5/4	107
202	171	Matasari	mun. Chisinau, str. Albi?oara, 7	112
203	171	Matasari	mun. Chisinau, str. Albi?oara, 7	116
204	172	Mazareanu	mun. Chi?inau, str. Calea Orhei...	101
205	172	Mazareanu	mun. Chi?inau, str. Calea Orhei...	107
206	172	Mazareanu	mun. Chi?inau, str. Calea Orhei...	119
207	173	Medrea	mun. Chisinau, or. Vadul lui Vo...	102
208	173	Medrea	mun. Chisinau, or. Vadul lui Vo...	106
209	173	Medrea	mun. Chisinau, or. Vadul lui Vo...	107
210	173	Medrea	mun. Chisinau, or. Vadul lui Vo...	113
211	173	Medrea	mun. Chisinau, or. Vadul lui Vo...	115
212	173	Medrea	mun. Chisinau, or. Vadul lui Vo...	117
213	173	Medrea	mun. Chisinau, or. Vadul lui Vo...	120
214	174	Mesesan	mun. Chisinau, str. Bogdan Vo...	108
215	174	Mesesan	mun. Chisinau, str. Bogdan Vo...	117

Figure 9: Gasiti numele, adresa studentilor si codul disciplinei la care studentii au avut eel putin o nota mai mare decat 8 in 2018.

	Prenume_Student	Nume_Student	Nota
24	Maria	Mesesan	6
25	Mihai	Ene	5
26	Norbert	Galambosi	5
27	Ovidiu	Dordai	5
28	Radu	Nicolae	7
29	Raul	Lucaciu	6
30	Robert	Poienar	5
31	Roland	Letea	7
32	Roman	Covas	5
33	Sergiu	Muresan	7
34	Sergiu	Orian	7
35	Teodora	Brasovianu	6
36	Valentina	Pitigoi	5
37	Viorel	Viman	6

Figure 10: Gasiti studentii (numele, prenumele), care au obtinut la disciplina Baze de date (examen), in anul 2018, vreo nota mai mica de 8 si mai mare ca 4.

	Nume_Profesor	Prenume_Profesor	Nota	Id_Student
1	Micu	Elena	2	101
2	Micu	Elena	2	119
3	Micu	Elena	2	165
4	Micu	Elena	3	111
5	Micu	Elena	3	156
6	Micu	Elena	4	135
7	Micu	Elena	4	169

Figure 11: Furnizati numele si prenumele profesorilor, care au predat disciplina Baze de date, in 2018, i au evaluat vreun student cu nota nesatisracatoare la reu ita curenta.

	Nume_Student	Prenume_Student	Disciplina	Tip_Evaluare	Nota	TheYear
37	Luca	Alex	Sisteme de calcul	Examen	7	2018
38	Luca	Alex	Sisteme de calcul	Reusita curenta	7	2018
39	Luca	Alex	Sisteme de calcul	Testul 1	9	2017
40	Luca	Alex	Sisteme de calcul	Testul 2	10	2017
41	Luca	Alex	Sisteme de operare	Examen	9	2018
42	Luca	Alex	Sisteme de operare	Reusita curenta	9	2018
43	Luca	Alex	Sisteme de operare	Testul 1	7	2017
44	Luca	Alex	Sisteme de operare	Testul 2	6	2017
45	Luca	Alex	Structuri de date si algori	Examen	10	2018
46	Luca	Alex	Structuri de date si algori	Reusita curenta	10	2018
47	Luca	Alex	Structuri de date si algori	Testul 1	9	2017
48	Luca	Alex	Structuri de date si algori	Testul 2	7	2017
49	Luca	Alex	Tehnologii de procesare...	Examen	10	2018
50	Luca	Alex	Tehnologii de procesare...	Reusita curenta	10	2018
51	Luca	Alex	Tehnologii de procesare...	Testul 1	8	2017
52	Luca	Alex	Tehnologii de procesare...	Testul 2	9	2017

Figure 12: Furnizati, in evidenta academica (reusita) a studentilor cu prenumele Alex, urmatoarele date: numele, prenumele, denumirea disciplinei, notele (inclusiv la probele intermediare) si anul la care au sustinut.

	Nume_Student	Prenume_Student	Disciplina	Id_Disciplina
6	Florea	Ioan	Baze de date	107
7	Florea	Ioan	Structuri de date si algoritmi	108
8	Florea	Ioan	Retele informatice	109
9	Florea	Ioan	Tehnologii de procesare a...	114
10	Florea	Ioan	Practica de licenta	117
11	Florea	Ioan	Practica de productie	118
12	Florea	Ioan	Integrare informationala e...	119
13	Florea	Ioan	Programe aplicative	120

Figure 13: Aflati cursurile urmate de catre studentul Florea Ioan.

	Prenume_Student	Nume_Student	Disciplina	Not
196	Stefan	Vacareanu	Proiectarea sistemelor informatice	10
197	Stefana	Judea	Practica de licenta	9
198	Stefana	Judea	Programarea calculatoarelor	9
199	Stefana	Judea	Programarea WEB	9
200	Teodora	Brasovianu	Cercetari operationale	9
201	Teodora	Brasovianu	Integrare informationala europeana	9
202	Teodora	Brasovianu	Practica de licenta	10
203	Teodora	Brasovianu	Programarea aplicatiilor Windows	9
204	Tudor	Maxim	Baze de date	9
205	Tudor	Maxim	Programarea calculatoarelor	10
206	Valentina	Pitigoi	Programarea calculatoarelor	9
207	Valentina	Pitigoi	Sisteme de calcul	10
208	Victor	Lucasu	Informatica aplicata	9
209	Victor	Lucasu	Practica de licenta	9
210	Victor	Lucasu	Programarea aplicatiilor Windows	10
211	Victor	Lucasu	Programarea declarativa	9
212	Victor	Lucasu	Proiectarea sistemelor informatice	9

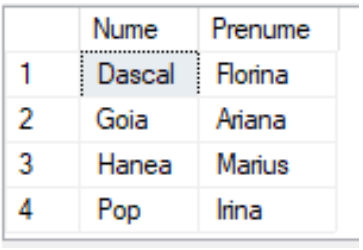
Figure 14: Aflati numele si prenumele studentilor, precum i cursurile promovate cu note mai mari de 8 la examen.

	Disciplina	NrOfProf
1	Practica de productie	3
2	Structuri de date si algoritmi	2

Figure 15: Sa se afi ase lista disciplinelor (Disciplina) predate de eel putin doi profesori

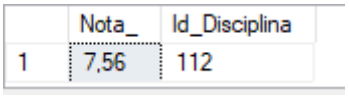
	(No column name)	Cod_Grupa
1	25	CIB171
2	25	INF171
3	25	TI171

Figure 16: in ce grupe de studii (CodGrupa) figureaza mai mult de 24 de studenti?



	Nume	Prenume
1	Dascal	Florina
2	Goia	Ariana
3	Hanea	Marius
4	Pop	Irina

Figure 17: Gasiti numele, prenumele i adresele studentilor si ale profesorilor care locuiesc pe strada 31 August.



	Nota_	Id_Disciplina
1	7,56	112

Figure 18: Gasiti disciplina sustinuta de studenti cu nota medie (la examen) cea mai inalta.

Conclusion

During This lab work i find out how to write SQL Queries in Transact SQL. I Also trained how to make correct JOINs, GROUP BYs ans SubQueries. Also I familiarized With SQL Language. [1]

References

[1] SQL Server Management Studio 2017, Tutorials for Lab 4

[2] MSSQL Official Documentation https://docs.microsoft.com/en-us/sql/t-sql/queries/select-transact-sql?view=sql-server-2017