

A dark blue vertical bar runs down the left side of the page. A blue arrow points to the right from this bar, containing the date.

5/17/2022

BAZE DE DATE

Proiect 9

Several thin, curved lines in dark blue and light grey originate from the bottom left corner and sweep upwards and to the right.

Faur Andrei-Cătălin

Enuntul proiectului

Se considera o aplicatie pentru evidenta studentilor.

Pentru orice student trebuie sa se salveze intr-o baza de date Oracle urmatoarele informatii:

- nume
- prenume
- nr. Legitimatie
- medie generala
- media pe anul1
- media pe anul2
- media pe anul3
- informatii despre notele obtinute:
 - Disciplina
 - Anul de studiu (in care se studiaza disciplina)
 - Nr. Presentare
 - Data prezentarii
 - Nota obtinuta

Stiind ca 'numele' nu depaseste 15 caractere, 'prenumele' nu depaseste 20 caractere, 'numarul de Legitimatie' are exact 6 caractere, toate mediile sunt numere cuprinse intre 0 si 10, un student se poate prezenta de oricate ori la un examen si ca in calculul mediilor intra nota maxima obtinuta pentru fiecare disciplina, se cere:

1. Să se realizeze proiectarea bazei de date aferente (structura de tabele, structura de coloane a fiecărei tabele, constrângeri).
2. Sa se scrie comenzile SQL pentru tabelele proiectate la punctul anterior.
3. Să se scrie comenzile SQL pentru popularea bazei de date cu urmatoarele informatii:

nume	prenume	Legitimatie	Media generala	Media pe anul1	Media pe anul2	Media pe anul3	disciplina	An studiu	Nr. prezentare	data	Nota
Popa	Ion	123456	4	5	0	0	Matematica	1	1	22/12/2020	4
Adam	Gheorghe	123457	7	5	0	0	Fizica	1	1	12/12/2020	9
Popa	Ion	123456	7	5	0	0	Chimie	2	1	01/03/2020	10
Popa	Ion	123456	7	5	0	0	Engleza	3	2	02/09/2020	9
Pop	George	123458	7	5	0	0	Matematica	1	1	12/12/2020	10

4. Să se scrie o interogare care sa afiseze studentii care au discipline nepromovate.
5. Sa se genereze un raport care sa cuprinda numele,prenumele, anul de studiu si numarul legitimatiei fiecarui student. (anul de studiu va fi maximul dintre anii la care are trecute note).
6. Sa se genereze un raport detaliat care sa cuprinda numele,prenumele, nr. legitimatiei, si toate notele finale la disciplinele promovate (denumirea disciplinei +nota), ordonat dupa nume,prenume, an de studiu, disciplina.

7. Sa se scrie un trigger care la adaugarea unei note sa calculeze automat media pe anul respectiv si media generala. (media se va face indiferent de nota obtinuta, considerand nota maxima pe disciplina)
8. Sa se scrie o functie care sa primeasca ca si parametru disciplina si sa returneze promovabilitatea la aceasta disciplina exprimata in procente.

Rezolvare:

1.

In proiectarea bazei de date am folosit doua tabele relationate intre ele. Prima tabela, numita Studenti, are campuri precum nume, prenume, media generala, media fiecarui an si nr. legitimatie, cu ajutorul ultimului camp, tabelul Studenti este conectat cu al doilea tabel facut, tabelul Note care are ca si campuri disciplina, anul de studiu, numarul prezentarii, data prezentarii si nota obtinuta.

In continuare va este prezentata implementarea acestora in limbajul SQL:

2.

```
CREATE TABLE Student(
nume VARCHAR(15) NOT NULL,
prenume VARCHAR(20) NOT NULL,
nrLegitimatie NUMBER(6) PRIMARY KEY CHECK(nrLegitimatie>99999),
mediaGenerala NUMBER(4,2) CHECK(mediaGenerala>=0 AND mediaGenerala<=10),
mediaAnul1 NUMBER(4,2) CHECK(mediaAnul1>=0 AND mediaAnul1<=10),
mediaAnul2 NUMBER(4,2) CHECK(mediaAnul2>=0 AND mediaAnul2<=10),
mediaAnul3 NUMBER(4,2) CHECK(mediaAnul3>=0 AND mediaAnul3<=10));
```

```
CREATE TABLE Note(
disciplina VARCHAR(10),
anStudiu INT CHECK(anStudiu BETWEEN 1 AND 4),
nrPrezente NUMBER(2),
dataPrezentari DATE DEFAULT SYSDATE,
notaObtinuta NUMBER(4,2) CHECK(notaObtinuta>=0 AND notaObtinuta<=10),
nrLegitimatie NUMBER(6) CHECK(nrLegitimatie>99999),
CONSTRAINT const1 FOREIGN KEY (nrLegitimatie)
REFERENCES Student(nrLegitimatie)
);
```

```
SQL> CREATE TABLE Student(
  2  nume VARCHAR(15) NOT NULL,
  3  prenume VARCHAR(20) NOT NULL,
  4  nrLegitimatie NUMBER(6) PRIMARY KEY CHECK(nrLegitimatie>99999),
  5  mediaGenerala NUMBER(4,2) CHECK(mediaGenerala>=0 AND mediaGenerala<=10),
  6  mediaAnul1 NUMBER(4,2) CHECK(mediaAnul1>=0 AND mediaAnul1<=10),
  7  mediaAnul2 NUMBER(4,2) CHECK(mediaAnul2>=0 AND mediaAnul2<=10),
  8  mediaAnul3 NUMBER(4,2) CHECK(mediaAnul3>=0 AND mediaAnul3<=10));
```

Table created.

```
SQL>
SQL> CREATE TABLE Note(
  2  disciplina VARCHAR(10),
  3  anStudiu INT CHECK(anStudiu BETWEEN 1 AND 4),
  4  nrPrezente NUMBER(2),
  5  dataPrezentari DATE DEFAULT SYSDATE,
  6  notaObtinuta NUMBER(4,2) CHECK(notaObtinuta>=0 AND notaObtinuta<=10),
  7  nrLegitimatie NUMBER(6) CHECK(nrLegitimatie>99999),
  8  CONSTRAINT const1 FOREIGN KEY (nrLegitimatie)
  9  REFERENCES Student(nrLegitimatie)
  10 );
```

Table created.

3.

Aici am populat tabelul Studenti:

```
INSERT INTO Student VALUES('Popa','Ion',123456,4,5,0,0);
INSERT INTO Student VALUES('Adam','Gheorghe',123457,7,5,0,0);
INSERT INTO Student VALUES('Pop','George',123458,7,5,0,0);
INSERT INTO Student VALUES('Gorie','Madaalin',123459,9,9,0,0);
INSERT INTO Student VALUES('Bogdan','Alex',123451,8,8,0,0);
INSERT INTO Student VALUES('Dragomir','Catalin',123452,8,8,0,0);
```

Aici am populat tabelul Note:

```
INSERT INTO Note VALUES('Matemaica',1,1,'22/12/2020',4,123456);
INSERT INTO Note VALUES('Chimie',2,1,'01/03/2020',10,123456);
INSERT INTO Note VALUES('Engleza',3,2,'02/09/2020',9,123456);
INSERT INTO Note VALUES('Fizica',1,1,'12/12/2020',9,123457);

INSERT INTO Note VALUES('Matemaica',1,1,'12/12/2020',10,123458);
INSERT INTO Note VALUES('Chimie',2,2,'01/02/2020',9,123459);
INSERT INTO Note VALUES('Matemaica',1,2,'02/01/2020',8,123459);
```

```

INSERT into Note VALUES('Logica',1,1,'12/12/2020',10,123459);
INSERT into Note VALUES('Istorie',1,1,'03/02/2020',7,123451);
INSERT into Note VALUES('Engleza',3,2,'10/01/2020',7,123451);
INSERT into Note VALUES('Franceza',2,1,'20/12/2020',7,123451);
INSERT into Note VALUES('Chimie',1,2,'10/03/2020',4,123452);
INSERT into Note VALUES('Matemaica',3,2,'12/01/2020',3,123452);
INSERT into Note VALUES('Logica',2,1,'18/12/2020',6,123452);

```

```

SQL> INSERT INTO Student VALUES('Popa','Ion',123456,4,5,0,0);
1 row created.
Commit complete.
SQL> INSERT INTO Student VALUES('Adam','Gheorghe',123457,7,5,0,0);
1 row created.
Commit complete.
SQL> INSERT INTO Student VALUES('Pop','George',123458,7,5,0,0);
1 row created.
Commit complete.
SQL> INSERT INTO Student VALUES('Gorie','Madalin',123459,9,9,0,0);
1 row created.
Commit complete.
SQL> INSERT INTO Student VALUES('Bogdan','Alex',123451,8,8,0,0);
1 row created.
Commit complete.
SQL> INSERT INTO Student VALUES('Dragomir','Catalin',123452,8,8,0,0);
1 row created.
Commit complete.

```

Tabelul cu student:

NUME	PRENUME	NRLEGITIMATIE	MEDIAGENERALA	MEDIAANUL1	MEDIAANUL2	MEDIAANUL3
Popa	Ion	123456	4	5	0	0
Adam	Gheorghe	123457	7	5	0	0
Pop	George	123458	7	5	0	0
Gorie	Madalin	123459	9	9	0	0
Bogdan	Alex	123451	8	8	0	0
Dragomir	Catalin	123452	8	8	0	0

6 rows selected.

Tabelul cu note:

DISCIPLINA	ANSTUDIU	NRPREZENTE	DATAPREZEN	NOTAOBTINUTA	NRLEGITIMATIE
Matematica	1	1	22-12-2020	4	123456
Chimie	2	1	01-03-2020	10	123456
Engleza	3	2	02-09-2020	9	123456
Fizica	1	1	12-12-2020	9	123457
Matematica	1	1	12-12-2020	10	123458
Chimie	2	2	01-02-2020	9	123459
Matematica	1	2	02-01-2020	8	123459
Logica	1	1	12-12-2020	10	123459
Istorie	1	1	03-02-2020	7	123451
Engleza	3	2	10-01-2020	7	123451
Franceza	2	1	20-12-2020	7	123451

DISCIPLINA	ANSTUDIU	NRPREZENTE	DATAPREZEN	NOTAOBTINUTA	NRLEGITIMATIE
Chimie	1	2	10-03-2020	4	123452
Matematica	3	2	12-01-2020	3	123452
Logica	2	1	18-12-2020	6	123452

14 rows selected.

4.

```
SELECT S.num, S.prenume FROM Student S, Note N
WHERE S.nrLegitimatie= N.nrLegitimatie AND N.notaObtinuta<=4
GROUP BY S.nrLegitimatie,S.num, S.prenume;
```

NUME	PRENUME
Popa	Ion
Dragomir	Catalin

5.

```
SELECT S.ume, S.prenume, MAX(N.anStudiu) AS anulDeStudiu , S.nrLegitimatie FROM Student S,
Note N
```

```
WHERE S.nrLegitimatie=N.nrLegitimatie
```

```
GROUP BY S.nrLegitimatie,S.ume,S.prenume;
```

NUME	PRENUME	ANULDESTUDIU	NRLEGITIMATIE
Popa	Ion	3	123456
Gorie	Madalin	2	123459
Bogdan	Alex	3	123451
Pop	George	1	123458
Adam	Gheorghe	1	123457
Dragomir	Catalin	3	123452

6 rows selected.

6.

```
SELECT S.nrLegitimatie, S.ume, S.prenume,N.disciplina,MAX(N.notaObtinuta) FROM Student S,
Note N
```

```
WHERE S.nrLegitimatie=N.nrLegitimatie
```

```
GROUP BY S.nrLegitimatie,S.ume,S.prenume,N.disciplina,N.anStudiu
```

```
HAVING MAX(N.notaObtinuta)>5
```

```
ORDER BY S.ume,S.prenume,N.anStudiu,N.disciplina;
```

NRLEGITIMATIE	NUME	PRENUME	DISCIPLINA	MAX(N.NOTAOBTINUTA)
123457	Adam	Gheorghe	Fizica	9
123451	Bogdan	Alex	Istorie	7
123451	Bogdan	Alex	Franceza	7
123451	Bogdan	Alex	Engleza	7
123452	Dragomir	Catalin	Logica	6
123459	Gorie	Madalin	Logica	10
123459	Gorie	Madalin	Matemaica	8
123459	Gorie	Madalin	Chimie	9
123458	Pop	George	Matemaica	10
123456	Popa	Ion	Chimie	10
123456	Popa	Ion	Engleza	9

11 rows selected.

7.

```
CREATE OR REPLACE TRIGGER Media
```

```

BEFORE INSERT OR UPDATE ON Note
FOR EACH ROW
DECLARE
k INT;
BEGIN
IF :NEW.anStudiu=1 THEN
    SELECT COUNT(*) INTO k FROM Note N Where N.anStudiu=1 AND
N.nrLegitimatie=:NEW.nrLegitimatie;
    UPDATE Student S SET mediaAnul1=(mediaAnul1*k+:NEW.notaObtinuta)/(k+1)
WHERE S.nrLegitimatie=:NEW.nrLegitimatie;
ELSIF :NEW.anStudiu=2 THEN
    SELECT COUNT(*) INTO k FROM Note N Where N.anStudiu=2 AND
N.nrLegitimatie=:NEW.nrLegitimatie;
    UPDATE Student S SET mediaAnul2=(mediaAnul2*k+:NEW.notaObtinuta)/(k+1)
WHERE S.nrLegitimatie=:NEW.nrLegitimatie;
ELSE
    SELECT COUNT(*) INTO k FROM Note N Where N.anStudiu=3 AND
N.nrLegitimatie=:NEW.nrLegitimatie;
    UPDATE Student S SET mediaAnul3=(mediaAnul3*k+:NEW.notaObtinuta)/(k+1)
WHERE S.nrLegitimatie=:NEW.nrLegitimatie;
END IF;
UPDATE Student S SET mediaGenerala=(mediaAnul1+mediaAnul2+mediaAnul3)/3 WHERE
S.nrLegitimatie=:NEW.nrLegitimatie AND mediaAnul1>0 AND mediaAnul2>0 AND
mediaAnul3>0;
UPDATE Student S SET mediaGenerala=(mediaAnul1+mediaAnul2)/2 WHERE
S.nrLegitimatie=:NEW.nrLegitimatie AND mediaAnul3<0;
UPDATE Student S SET mediaGenerala=(mediaAnul2+mediaAnul3)/2 WHERE
S.nrLegitimatie=:NEW.nrLegitimatie AND mediaAnul1<0;
UPDATE Student S SET mediaGenerala=mediaAnul1 WHERE
S.nrLegitimatie=:NEW.nrLegitimatie AND mediaAnul2<= 0 AND mediaAnul3<=0;
UPDATE Student S SET mediaGenerala=mediaAnul2 WHERE
S.nrLegitimatie=:NEW.nrLegitimatie AND mediaAnul1<= 0 AND mediaAnul3<=0;
UPDATE Student S SET mediaGenerala=mediaAnul3 WHERE
S.nrLegitimatie=:NEW.nrLegitimatie AND mediaAnul1<= 0 AND mediaAnul2<=0;

END;
/
INSERT into Note VALUES('Economie',1,1,'12/12/2020',10,123459);
SELECT * FROM Student;

```

NUME	PRENUME	NRLEGITIMATIE	MEDIAGENERALA	MEDIAANUL1	MEDIAANUL2	MEDIAANUL3
Popa	Ion	123456	4	5	0	0
Adam	Gheorghe	123457	7	5	0	0
Pop	George	123458	7	5	0	0
Gorie	Madalin	123459	9.33	9.33	0	0
Bogdan	Alex	123451	8	8	0	0
Dragomir	Catalin	123452	8	8	0	0

6 rows selected.

8.

```
CREATE OR REPLACE FUNCTION Promovabilitate(discipli VARCHAR)
```



```

RETURN NUMBER
AS
x NUMBER(2);
y NUMBER(2);
promo NUMBER(5,2);
BEGIN
SELECT COUNT(disciplina) INTO x FROM Student S, Note N
WHERE S.nrLegitimatie=N.nrLegitimatie AND disciplina=discipli
GROUP BY disciplina;
SELECT COUNT(DISTINCT N.nrLegitimatie) INTO y FROM Student S, Note N
WHERE S.nrLegitimatie=N.nrLegitimatie AND disciplina=discipli AND notaObtinuta>=5
GROUP BY disciplina;
promo:=(y/x)*100;
RETURN promo;
END;

```

/

```
SELECT Promovabilitate('Matemaica') FROM dual;
```

```

PROMOVABILITATE( 'MATEMAICA' )
-----
                        50

```