

Proiectarea unei Baze de Date a Căilor Feroviare din România

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1. Descrierea modelului

În această secțiune voi prezenta modelul real al bazei de date, utilitatea acestuia, dar și regulile de funcționare.

Baza de date se ocupă de gestionarea traseelor feroviare din România, fără cele de transport de marfă.

Fiecare gară se află într-un oraș/localitate, fiecare oraș/ localitate se află într-o regiune, iar o regiune conține mai unul sau mai multe orașe. Un traseu are doi conductori: unul principal și unul secundar. Pentru simplitate vom considera că fiecare conductor de tren aparține unei singure gări ca angajat, chiar dacă acesta se regăsește pe trasee ce leagă localități din regiuni diferite. Pentru un conductor se cunoaște numele, prenumele, numărul de telefon, data angajării și salariul.

Traseul se desfășoară între o gară de plecare și una de sosire considerate capete de traseu. Pentru fiecare traseu se cunoaște trenul utilizat. Un tren este deținut de o singură companie și are vagoane încadrate la una sau mai multe clase. Fiecare clasă are un preț adițional în funcție de facilitățile oferite și un număr de locuri. O companie de trenuri deține unul sau mai multe trenuri.

Un pasager își poate rezerva unul sau mai multe bilete pe cel puțin un traseu. Pe biletul fiecărui pasager este menționată clasa pentru care s-a făcut rezervarea. De asemenea, se cunoaște atât gara la care pasagerul s-a îmbarcat, cât și cea la care a coborât. Pentru un pasager se cunoaște numele, prenumele, numărul de telefon, adresa de mail și data nașterii.

Un controlor aparține unei singure gări ca angajat, iar acesta poate verifica biletele pe mai multe trasee. Pe un traseu verifică biletele unul sau mai mulți controlori. Pentru un controlor se cunosc numele, prenumele, data angajării, salariul și numărul de telefon.

2. Diagrama Entitate – Relație



Figura 1 – Diagrama Entitate – Relație

3. Diagrama Conceptuală

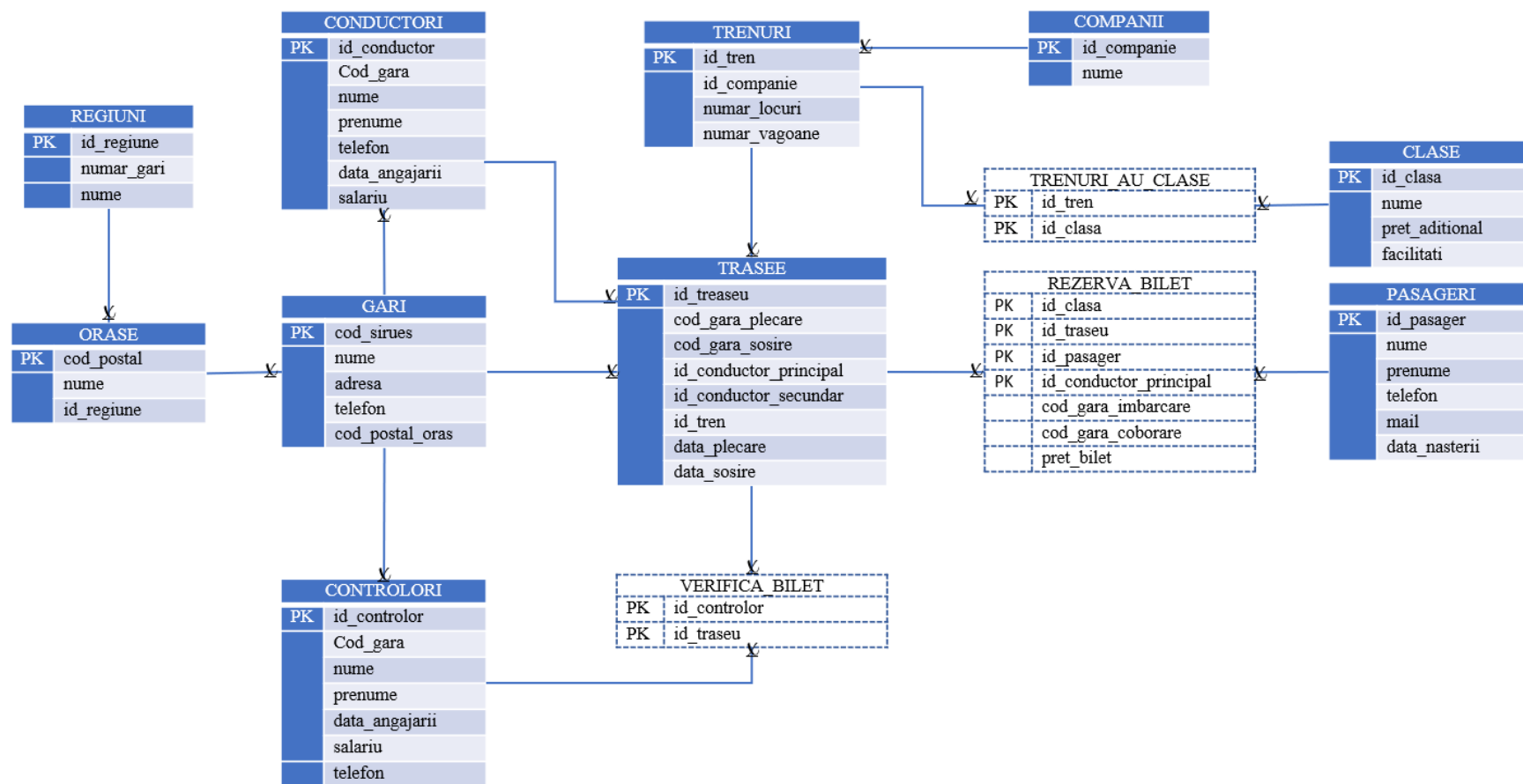


Figura 2 – Diagrama Conceptuală

4. Crearea tabelelor și a constrângerilor

-- Crearea tabelelor si a constrangerilor

```
CREATE TABLE GARI(cod_SIRUES varchar2(5) CONSTRAINT gari_pk PRIMARY KEY,  
nume varchar2(60) NOT NULL,  
adresa varchar2(75) NOT NULL,  
telefon varchar2(10) NOT NULL,  
cod_postal_oras varchar2(6) NOT NULL, CONSTRAINT gari_orase_fk FOREIGN  
KEY(cod_postal_oras) references ORASE(cod_postal)  
);
```

```
CREATE TABLE REGIUNI(id_regiune varchar2(4) CONSTRAINT regiuni_pk PRIMARY KEY,  
nume varchar2(20) NOT NULL,  
numar_gari number(3));
```

```
CREATE TABLE ORASE(cod_postal varchar2(6) CONSTRAINT orase_pk PRIMARY KEY,  
nume varchar2(20) NOT NULL,  
id_regiune varchar2(4) NOT NULL, CONSTRAINT orase_regiuni_fk FOREIGN  
KEY(id_regiune) references REGIUNI(id_regiune)  
);
```

```
CREATE TABLE CONDUCTORI(  
id_conductor number(4) CONSTRAINT conductori_pk PRIMARY KEY,  
cod_gara varchar2(5) NOT NULL, CONSTRAINT conductori_gari_fk FOREIGN  
KEY(cod_gara) REFERENCES GARI(cod_SIRUES),  
nume varchar2(40) NOT NULL,  
prenume varchar2(40) NOT NULL,  
telefon varchar2(10) NOT NULL,  
data_angajarii date DEFAULT sysdate NOT NULL,  
salariu number(6) NOT NULL  
);
```

```
CREATE TABLE CONTROLORI(  
id_controlor number(4) CONSTRAINT controlori_pk PRIMARY KEY,  
cod_gara varchar2(5) NOT NULL, CONSTRAINT controlorii_gari_fk FOREIGN  
KEY(cod_gara) REFERENCES GARI(cod_SIRUES),  
nume varchar2(40) NOT NULL,  
prenume varchar2(40) NOT NULL,  
telefon varchar2(10) NOT NULL,  
data_angajarii date DEFAULT sysdate NOT NULL,
```

```
salariu number(6) NOT NULL  
);
```

```
CREATE TABLE COMPANII(  
id_comanie number(3) CONSTRAINT companii_pk PRIMARY KEY,  
nume varchar2(40) NOT NULL  
);
```

```
CREATE TABLE TRENURI(  
id_tren number(4) CONSTRAINT trenuri_pk PRIMARY KEY,  
id_comanie number(3) NOT NULL, CONSTRAINT trenuri_companii_fk FOREIGN  
KEY(id_comanie) REFERENCES COMPANII(id_comanie),  
numar_locuri number(3),  
numar_vagoane number(2)  
);
```

```
CREATE TABLE TRASEE(  
id_traseu number(6) CONSTRAINT trasee_pk PRIMARY KEY,  
cod_gara_plecare varchar2(5) NOT NULL, CONSTRAINT trasee_gari_fk1 FOREIGN  
KEY(cod_gara_plecare) REFERENCES GARI(cod_SIRUES),  
cod_gara_sosire varchar2(5) NOT NULL, CONSTRAINT trasee_gari_fk2 FOREIGN  
KEY(cod_gara_sosire) REFERENCES GARI(cod_SIRUES),  
id_conductor_principal number(4) NOT NULL, CONSTRAINT trasee_conductori_fk1  
FOREIGN KEY(id_conductor_principal) REFERENCES CONDUCTORI(id_conductor),  
id_conductor_secundar number(4) NOT NULL, CONSTRAINT trasee_conductori_fk2  
FOREIGN KEY(id_conductor_secundar) REFERENCES CONDUCTORI(id_conductor),  
id_tren number(4) NOT NULL, CONSTRAINT trasee_trenuri_fk FOREIGN KEY(id_tren)  
REFERENCES TRENURI(id_tren),  
data_plecare date NOT NULL,  
data_sosire date NOT NULL  
);
```

```
CREATE TABLE CLASE(  
id_clasa number(2) CONSTRAINT clase_pk PRIMARY KEY,  
nume varchar2(25) NOT NULL,  
pret_aditional number(5),  
facilitati varchar2(75)  
);
```

```
CREATE TABLE TRENURI_AU_CLASE(  

```

```

id_tren number(4) NOT NULL, CONSTRAINT trenuri_au_clase_trenuri_fk FOREIGN
KEY(id_tren) REFERENCES TRENURI(id_tren),
id_clasa number(2) NOT NULL, CONSTRAINT trenuri_au_clase_clase_fk FOREIGN
KEY(id_clasa) REFERENCES CLASE(id_clasa),
CONSTRAINT trenuri_au_clase_pk PRIMARY KEY(id_tren, id_clasa)
);

CREATE TABLE VERIFICA_BILET(
id_controlor number(4), CONSTRAINT verifica_bilete_controlor_fk FOREIGN
KEY(id_controlor) REFERENCES CONTROLORI(id_controlor),
id_traseu number(6), CONSTRAINT verifica_bilete_traseu_fk FOREIGN KEY(id_traseu)
REFERENCES TRASEE(id_traseu),
CONSTRAINT verifica_bilet_pk PRIMARY KEY(id_controlor, id_traseu)
);

CREATE TABLE PASAGERI(
id_pasager number(4) CONSTRAINT pasageri_pk PRIMARY KEY,
nume varchar2(40) NOT NULL,
prenume varchar2(40) NOT NULL,
telefon varchar2(10) NOT NULL,
mail varchar2(120) NOT NULL,
data_nasterii date NOT NULL
);

CREATE TABLE REZERVA_BILET(
id_clasa number(2) NOT NULL, CONSTRAINT rezerva_bilet_clasa_fk FOREIGN
KEY(id_clasa) REFERENCES CLASE(id_clasa),
id_traseu number(6) NOT NULL, CONSTRAINT rezerva_bilet_traseu_fk FOREIGN
KEY(id_traseu) REFERENCES TRASEE(id_traseu),
id_pasager number(4) NOT NULL, CONSTRAINT rezerva_bilet_pasager_fk FOREIGN
KEY(id_pasager) REFERENCES PASAGERI(id_pasager),
id_rezervare number(8) NOT NULL,
cod_gara_imbarcare varchar2(5) NOT NULL, CONSTRAINT rezerva_bilet_imabrcare_fk
FOREIGN KEY(cod_gara_imbarcare) REFERENCES GARI(cod_SIRUES),
cod_gara_coborare varchar2(5) NOT NULL, CONSTRAINT rezerva_bilet_coborare_fk
FOREIGN KEY(cod_gara_coborare) REFERENCES GARI(cod_SIRUES),
pret_bilet number(4),
CONSTRAINT rezerva_bilet_pk PRIMARY KEY(id_clasa, id_traseu, id_pasager,
id_rezervare)
);

```


5. Inserarea datelor

-- Inserarea de date

```
INSERT INTO REGIUNI VALUES ('MUN', 'Muntenia', 78);

INSERT INTO REGIUNI VALUES ('TRA', 'Transilvania', 114);

INSERT INTO REGIUNI VALUES ('OLT', 'Oltenia', 67);

INSERT INTO REGIUNI VALUES ('BN', 'Banat', 54);

INSERT INTO REGIUNI VALUES ('CR', 'Crisana', 48);

INSERT INTO REGIUNI VALUES ('MRM', 'Maramures', 37);

INSERT INTO REGIUNI VALUES ('BCV', 'Bucovina', 42);

INSERT INTO REGIUNI VALUES ('MDV', 'Moldova', 107);

INSERT INTO REGIUNI VALUES ('DOB', 'Dobrogea', 82);

SELECT * FROM REGIUNI;

INSERT INTO ORASE VALUES ('625100', 'Iasi', 'MDV');
INSERT INTO ORASE VALUES ('783222', 'Craiova', 'OLT');
INSERT INTO ORASE VALUES ('024667', 'Galati', 'MDV');
INSERT INTO ORASE VALUES ('963323', 'Buzau', 'MUN');
INSERT INTO ORASE VALUES ('349909', 'Bacau', 'MDV');
INSERT INTO ORASE VALUES ('278898', 'Slatina', 'OLT');
INSERT INTO ORASE VALUES ('345556', 'Ramnicu Valcea', 'OLT');
INSERT INTO ORASE VALUES ('455303', 'Sibiu', 'TRA');
INSERT INTO ORASE VALUES ('243344', 'Cluj-Napoca', 'TRA');
INSERT INTO ORASE VALUES ('878866', 'Tulcea', 'DOB');
INSERT INTO ORASE VALUES ('878767', 'Constanta', 'DOB');
INSERT INTO ORASE VALUES ('677723', 'Bucuresti', 'MUN');
INSERT INTO ORASE VALUES ('900459', 'Timisoara', 'BN');
INSERT INTO ORASE VALUES ('324543', 'Oradea', 'CR');
INSERT INTO ORASE VALUES ('876543', 'Satu Mare', 'MRM');

SELECT * FROM ORASE;
```

```

INSERT INTO GARI VALUES ('27732', 'Gara de Nord Bucuresti', 'Soseaua Bucuresti 7', '0256022608', '677723');
INSERT INTO GARI VALUES ('27765', 'Gara Bucuresti Baneasa', 'Soseaua Baneasa 15', '0232312111', '677723');
INSERT INTO GARI VALUES ('33444', 'Gara Craiova Dolj', 'Soseaua Craiova 18', '0388737872', '783222');
INSERT INTO GARI VALUES ('33445', 'Gara Galati', 'Soseaua Galati 15', '0243435434', '024667');
INSERT INTO GARI VALUES ('33234', 'Gara Buzau', 'Soseaua Buzau 5', '0245465566', '963323');
INSERT INTO GARI VALUES ('33267', 'Gara Bacau', 'Soseaua Bacau 9', '0344434345', '349909');
INSERT INTO GARI VALUES ('33654', 'Gara Slatina', 'Soseaua Slatina 12', '0344353267', '278898');
INSERT INTO GARI VALUES ('33652', 'Gara Ramnicu Valcea', 'Soseaua Ramnicu Valcea 11', '0376755565', '345556');
INSERT INTO GARI VALUES ('33765', 'Gara Sibiu', 'Soseaua Sibiu 13', '0398765432', '455303');
INSERT INTO GARI VALUES ('45565', 'Gara Cluj-Napoca', 'Soseaua Cluj 19', '0467576657', '243344');
INSERT INTO GARI VALUES ('45325', 'Gara Tulcea', 'Soseaua Tulcea 3', '0468765467', '878866');
INSERT INTO GARI VALUES ('45367', 'Gara Constanta', 'Soseaua Constanta 6', '0567575567', '878767');
INSERT INTO GARI VALUES ('48768', 'Gara Timisoara', 'Soseaua Timisoara 13', '0623343434', '900459');
INSERT INTO GARI VALUES ('48769', 'Gara Oradea', 'Soseaua Oradea 8', '0676664645', '324543');
INSERT INTO GARI VALUES ('48898', 'Gara Satu Mare', 'Soseaua Satu Mare 4', '0676687897', '876543');

```

```

SELECT * FROM GARI;

```

```

CREATE SEQUENCE CONDUCTORI_SECV
START WITH 10
INCREMENT BY 1
MAXVALUE 9999
NOCYCLE;

```

```

INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '27765', 'Popescu', 'Ion', '0766749327', to_date('07-12-2020', 'DD-MM-YYYY'), 4500);
INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '27765', 'Radoiu', 'Vlad', '0766435557', to_date('03-11-2021', 'DD-MM-YYYY'), 3800);

```

```

INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '27765', 'Ionescu',
'George', '0766456445', to_date('07-10-2019', 'DD-MM-YYYY'), 4700);
INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '27732', 'Floreas',
'Cosmin', '0745436673', to_date('10-02-2020', 'DD-MM-YYYY'), 4100);
INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '27732', 'Dumitru',
'Denis', '0749876656', to_date('12-04-2020', 'DD-MM-YYYY'), 3900);
INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '33444', 'Urzeala',
'Andrei', '0756655675', to_date('06-07-2018', 'DD-MM-YYYY'), 5400);
INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '33445', 'Teodorescu',
'Tudor', '0723303042', to_date('08-09-2018', 'DD-MM-YYYY'), 2300);
INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '33267', 'Costache',
'Gigel', '0704375723', to_date('10-11-2017', 'DD-MM-YYYY'), 3400);
INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '33234', 'Ene', 'Sergiu',
'0723438446', to_date('04-05-2017', 'DD-MM-YYYY'), 4700);
INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '33652', 'Popa',
'Alexandru', '0798666743', to_date('10-10-2016', 'DD-MM-YYYY'), 6000);
INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '45325', 'Tudose',
'Petru', '0736664324', to_date('06-08-2016', 'DD-MM-YYYY'), 3500);
INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '45325', 'Moraru',
'Vasile', '0746885480', to_date('04-07-2016', 'DD-MM-YYYY'), 4000);
INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '33765', 'Dragan',
'Mihai', '0754566643', to_date('06-06-2015', 'DD-MM-YYYY'), 4600);
INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '45565', 'Rusu', 'Gigel',
'0796564335', to_date('06-03-2015', 'DD-MM-YYYY'), 3700);
INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '45325', 'Matei',
'Alexandru', '0766788312', to_date('23-04-2014', 'DD-MM-YYYY'), 3900);
INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '45367', 'Stanciu',
'Marian', '0712434112', to_date('25-07-2014', 'DD-MM-YYYY'), 4100);
INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '45325', 'Dedu',
'Andrei', '0789555732', to_date('13-11-2012', 'DD-MM-YYYY'), 2600);
INSERT INTO CONDUCTORI VALUES (CONDUCTORI_SECV.NEXTVAL, '48898', 'Lengher',
'Ionut', '0708964899', to_date('27-10-2013', 'DD-MM-YYYY'), 4300);

```

```

SELECT * FROM CONDUCTORI;

```

```

INSERT INTO COMPANII VALUES(1, 'Grup Feroviar Roman');
INSERT INTO COMPANII VALUES(2, 'Transferoviar Calatori');
INSERT INTO COMPANII VALUES(3, 'Regio Calatori');
INSERT INTO COMPANII VALUES(4, 'Softrans');
INSERT INTO COMPANII VALUES(5, 'Astra Trans Carpatia');

```

```

SELECT * FROM COMPANII;

```

```

CREATE SEQUENCE TRENURI_SECV
START WITH 10
INCREMENT BY 1
MAXVALUE 9999
NOCYCLE;

INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 1, 240, 10);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 1, 220, 10);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 1, 200, 9);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 1, 220, 10);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 1, 160, 8);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 2, 180, 8);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 2, 200, 9);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 3, 160, 7);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 3, 180, 9);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 1, 200, 10);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 1, 220, 10);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 4, 210, 10);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 1, 240, 10);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 1, 220, 10);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 5, 180, 8);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 1, 160, 7);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 5, 140, 6);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 1, 150, 6);
INSERT INTO TRENURI VALUES(TRENURI_SECV.NEXTVAL, 4, 200, 9);

SELECT * FROM TRENURI;

INSERT INTO CLASE VALUES(10, 'Clasa I', NULL, NULL);
INSERT INTO CLASE VALUES(11, 'Clasa II', 200, 'aer conditionat');
INSERT INTO CLASE VALUES(12, 'Clasa II pachet exclusive', 500, 'acces vagon
restaurant');
INSERT INTO CLASE VALUES(13, 'CLASA II pachet confort', 600, 'loc de dormit');
INSERT INTO CLASE VALUES(14, 'Clasa II pachet premium', 800, 'acces vagon
restaurant, loc de dormit, scaune rabatabile cu priza type-C');

SELECT * FROM CLASE;

SELECT * FROM TRENURI_AU_CLASE;

INSERT INTO TRENURI_AU_CLASE VALUES (10, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (10, 11);

INSERT INTO TRENURI_AU_CLASE VALUES (11, 10);

```

```

INSERT INTO TRENURI_AU_CLASE VALUES (11, 11);
INSERT INTO TRENURI_AU_CLASE VALUES (11, 12);

INSERT INTO TRENURI_AU_CLASE VALUES (12, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (12, 13);
INSERT INTO TRENURI_AU_CLASE VALUES (12, 14);

INSERT INTO TRENURI_AU_CLASE VALUES (13, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (13, 11);
INSERT INTO TRENURI_AU_CLASE VALUES (13, 12);

INSERT INTO TRENURI_AU_CLASE VALUES (14, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (14, 11);
INSERT INTO TRENURI_AU_CLASE VALUES (14, 12);
INSERT INTO TRENURI_AU_CLASE VALUES (14, 13);
INSERT INTO TRENURI_AU_CLASE VALUES (14, 14);

INSERT INTO TRENURI_AU_CLASE VALUES (15, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (15, 12);
INSERT INTO TRENURI_AU_CLASE VALUES (15, 13);
INSERT INTO TRENURI_AU_CLASE VALUES (15, 14);

INSERT INTO TRENURI_AU_CLASE VALUES (16, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (16, 11);

INSERT INTO TRENURI_AU_CLASE VALUES (17, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (17, 13);

INSERT INTO TRENURI_AU_CLASE VALUES (18, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (18, 11);
INSERT INTO TRENURI_AU_CLASE VALUES (18, 12);

INSERT INTO TRENURI_AU_CLASE VALUES (19, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (19, 13);
INSERT INTO TRENURI_AU_CLASE VALUES (19, 14);

INSERT INTO TRENURI_AU_CLASE VALUES (20, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (20, 11);

INSERT INTO TRENURI_AU_CLASE VALUES (21, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (21, 12);
INSERT INTO TRENURI_AU_CLASE VALUES (21, 13);

INSERT INTO TRENURI_AU_CLASE VALUES (22, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (22, 11);

```

```

INSERT INTO TRENURI_AU_CLASE VALUES (22, 12);
INSERT INTO TRENURI_AU_CLASE VALUES (22, 13);

INSERT INTO TRENURI_AU_CLASE VALUES (23, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (23, 11);

INSERT INTO TRENURI_AU_CLASE VALUES (24, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (24, 11);
INSERT INTO TRENURI_AU_CLASE VALUES (24, 12);
INSERT INTO TRENURI_AU_CLASE VALUES (24, 13);

INSERT INTO TRENURI_AU_CLASE VALUES (25, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (25, 11);

INSERT INTO TRENURI_AU_CLASE VALUES (26, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (26, 11);
INSERT INTO TRENURI_AU_CLASE VALUES (26, 12);

INSERT INTO TRENURI_AU_CLASE VALUES (27, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (27, 11);
INSERT INTO TRENURI_AU_CLASE VALUES (27, 12);

INSERT INTO TRENURI_AU_CLASE VALUES (28, 10);
INSERT INTO TRENURI_AU_CLASE VALUES (28, 11);
INSERT INTO TRENURI_AU_CLASE VALUES (28, 12);
INSERT INTO TRENURI_AU_CLASE VALUES (28, 13);

SELECT * FROM CONTROLORI;

CREATE SEQUENCE CONTROLORI_SECV
START WITH 10
INCREMENT BY 1
MAXVALUE 9999
NOCYCLE;

INSERT INTO CONTROLORI VALUES (CONTROLORI_SECV.NEXTVAL, '27732', 'Georgescu',
'Ion', '0766723327', to_date('07-11-2020', 'DD-MM-YYYY'), 4000);
INSERT INTO CONTROLORI VALUES (CONTROLORI_SECV.NEXTVAL, '27732', 'Panescu',
'Florin', '0735656785', to_date('09-10-2018', 'DD-MM-YYYY'), 4100);
INSERT INTO CONTROLORI VALUES (CONTROLORI_SECV.NEXTVAL, '27765', 'Florescu',
'Mihnea', '0766722327', to_date('10-10-2018', 'DD-MM-YYYY'), 4200);
INSERT INTO CONTROLORI VALUES (CONTROLORI_SECV.NEXTVAL, '33444', 'Deleanu',
'Ionut', '0789723327', to_date('12-07-2016', 'DD-MM-YYYY'), 4300);

```

```

INSERT INTO CONTROLORI VALUES (CONTROLORI_SECV.NEXTVAL, '33445', 'Dascalu',
'David', '0766724456', to_date('09-12-2018', 'DD-MM-YYYY'), 3900);
INSERT INTO CONTROLORI VALUES (CONTROLORI_SECV.NEXTVAL, '33234', 'Dragan',
'Liviu', '0766787727', to_date('21-09-2019', 'DD-MM-YYYY'), 3600);
INSERT INTO CONTROLORI VALUES (CONTROLORI_SECV.NEXTVAL, '33267', 'Popescu',
'Stefan', '0734523327', to_date('07-03-2020', 'DD-MM-YYYY'), 3400);
INSERT INTO CONTROLORI VALUES (CONTROLORI_SECV.NEXTVAL, '33654', 'Banu',
'Marcel', '0766722237', to_date('07-08-2019', 'DD-MM-YYYY'), 3900);
INSERT INTO CONTROLORI VALUES (CONTROLORI_SECV.NEXTVAL, '33652', 'Popa',
'Andrei', '0756724237', to_date('05-07-2016', 'DD-MM-YYYY'), 4200);
INSERT INTO CONTROLORI VALUES (CONTROLORI_SECV.NEXTVAL, '33765', 'Andronache',
'Cosmin', '0745524237', to_date('11-09-2017', 'DD-MM-YYYY'), 4100);
INSERT INTO CONTROLORI VALUES (CONTROLORI_SECV.NEXTVAL, '45565', 'Raducu',
'Mircea', '0767724237', to_date('10-05-2017', 'DD-MM-YYYY'), 4000);
INSERT INTO CONTROLORI VALUES (CONTROLORI_SECV.NEXTVAL, '45565', 'Matei', 'Vlad',
'0767721137', to_date('24-06-2019', 'DD-MM-YYYY'), 3900);
INSERT INTO CONTROLORI VALUES (CONTROLORI_SECV.NEXTVAL, '45367', 'Rusu', 'Ionut',
'0767732335', to_date('21-11-2020', 'DD-MM-YYYY'), 4100);
INSERT INTO CONTROLORI VALUES (CONTROLORI_SECV.NEXTVAL, '48768', 'Costache',
'Antonio', '0723332453', to_date('19-10-2020', 'DD-MM-YYYY'), 4000);
INSERT INTO CONTROLORI VALUES (CONTROLORI_SECV.NEXTVAL, '48769', 'Mihalache',
'George', '0789454323', to_date('29-04-2019', 'DD-MM-YYYY'), 3900);
INSERT INTO CONTROLORI VALUES (CONTROLORI_SECV.NEXTVAL, '48898', 'Ionescu',
'Mihail', '0765556787', to_date('25-05-2020', 'DD-MM-YYYY'), 3600);
INSERT INTO CONTROLORI VALUES (CONTROLORI_SECV.NEXTVAL, '48898', 'Ionescu',
'Marius', '0765556745', to_date('11-05-2020', 'DD-MM-YYYY'), 3700);

```

```

CREATE SEQUENCE PASAGERI_SECV

```

```

START WITH 10

```

```

INCREMENT BY 1

```

```

MAXVALUE 9999

```

```

NOCYCLE;

```

```

INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Negoita', 'Mirel',
'0765785348', 'negoitamirel@yahoo.com', to_date('25-05-1985', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Tudor', 'Iulian',
'0733533459', 'tudoriulian@yahoo.com', to_date('12-06-1978', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Fratila', 'Catalin',
'0708393404', 'fratilacatalin@yahoo.com', to_date('05-04-1996', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Munteanu', 'Mirel',
'0714729299', 'munteanumirel@yahoo.com', to_date('07-11-2000', 'DD-MM-YYYY'));

```



```

INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Moldoveanu', 'David',
'0723421367', 'munteanumirel@yahoo.com', to_date('06-12-1997', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Tomescu', 'Iulian',
'0768945678', 'munteanumirel@yahoo.com', to_date('23-08-1983', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Diaconu', 'David',
'0723790210', 'munteanumirel@yahoo.com', to_date('14-05-1969', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Deaconu', 'Valeriu',
'0735464625', 'munteanumirel@yahoo.com', to_date('18-03-1975', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Georgescu', 'Denis',
'0776878877', 'georgescudenis@yahoo.com', to_date('20-05-2002', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Costache', 'Andrei',
'0767534558', 'costacheandrei@yahoo.com', to_date('13-07-2001', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Albu', 'Iulian',
'0743647372', 'albuilulian@yahoo.com', to_date('10-10-1980', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Dumitru', 'Marius',
'0778954658', 'dumitrumarius@yahoo.com', to_date('15-10-1995', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Popescu', 'Florin',
'0716342383', 'popescufloirin@yahoo.com', to_date('06-07-1997', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Paduraru', 'George',
'0747433243', 'padurarugeorge@yahoo.com', to_date('14-11-1979', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Verdes', 'Silviu',
'0765897774', 'verdessilviu@yahoo.com', to_date('10-09-1979', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Cristea', 'Madalin',
'0792004221', 'cristeamadalin@yahoo.com', to_date('26-04-1995', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Floreas', 'Cosmin',
'0734275214', 'floreacosmin@yahoo.com', to_date('12-10-1995', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Radu', 'Stefan',
'0714421423', 'radustefan@yahoo.com', to_date('15-01-1985', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Gheorghe', 'Radu',
'0789431478', 'gheorgheradu@yahoo.com', to_date('20-04-1993', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Paun', 'Andrei',
'0774867862', 'paunandrei@yahoo.com', to_date('23-10-2000', 'DD-MM-YYYY'));
INSERT INTO PASAGERI VALUES (PASAGERI_SECV.NEXTVAL, 'Paun', 'Ilie', '0774834462',
'paunilie@yahoo.com', to_date('14-09-1997', 'DD-MM-YYYY'));

```

```

SELECT * FROM PASAGERI;

```

```

CREATE SEQUENCE TRASEE_SECV
START WITH 10
INCREMENT BY 1
MAXVALUE 9999
NOCYCLE;

```



```
SELECT * FROM TRASEE;
```

```
INSERT INTO TRASEE VALUES (TRASEE_SECV.NEXTVAL, '33445', '33267', 17, 18, 12,  
to_date('23-10-2022', 'DD-MM-YYYY'), to_date('23-10-2022', 'DD-MM-YYYY'));  
INSERT INTO TRASEE VALUES (TRASEE_SECV.NEXTVAL, '27732', '45367', 14, 26, 22,  
to_date('10-07-2022', 'DD-MM-YYYY'), to_date('10-07-2022', 'DD-MM-YYYY'));  
INSERT INTO TRASEE VALUES (TRASEE_SECV.NEXTVAL, '27765', '33652', 13, 20, 14,  
to_date('15-11-2022', 'DD-MM-YYYY'), to_date('15-11-2022', 'DD-MM-YYYY'));  
INSERT INTO TRASEE VALUES (TRASEE_SECV.NEXTVAL, '33765', '45565', 23, 24, 15,  
to_date('07-04-2022', 'DD-MM-YYYY'), to_date('07-04-2022', 'DD-MM-YYYY'));  
INSERT INTO TRASEE VALUES (TRASEE_SECV.NEXTVAL, '48768', '48898', 28, 24, 18,  
to_date('25-10-2022', 'DD-MM-YYYY'), to_date('26-10-2022', 'DD-MM-YYYY'));  
INSERT INTO TRASEE VALUES (TRASEE_SECV.NEXTVAL, '33234', '45325', 19, 21, 11,  
to_date('19-03-2022', 'DD-MM-YYYY'), to_date('19-03-2022', 'DD-MM-YYYY'));  
INSERT INTO TRASEE VALUES (TRASEE_SECV.NEXTVAL, '48768', '33654', 16, 28, 17,  
to_date('17-10-2022', 'DD-MM-YYYY'), to_date('17-10-2022', 'DD-MM-YYYY'));  
INSERT INTO TRASEE VALUES (TRASEE_SECV.NEXTVAL, '45565', '48768', 24, 16, 26,  
to_date('24-09-2022', 'DD-MM-YYYY'), to_date('24-09-2022', 'DD-MM-YYYY'));  
INSERT INTO TRASEE VALUES (TRASEE_SECV.NEXTVAL, '33444', '48769', 16, 28, 14,  
to_date('27-10-2022', 'DD-MM-YYYY'), to_date('27-10-2022', 'DD-MM-YYYY'));  
INSERT INTO TRASEE VALUES (TRASEE_SECV.NEXTVAL, '27765', '48898', 12, 13, 10,  
to_date('13-10-2022', 'DD-MM-YYYY'), to_date('13-10-2022', 'DD-MM-YYYY'));  
INSERT INTO TRASEE VALUES (TRASEE_SECV.NEXTVAL, '45565', '45367', 24, 26, 24,  
to_date('09-08-2022', 'DD-MM-YYYY'), to_date('10-08-2022', 'DD-MM-YYYY'));  
INSERT INTO TRASEE VALUES (TRASEE_SECV.NEXTVAL, '33267', '27732', 18, 15, 16,  
to_date('10-12-2022', 'DD-MM-YYYY'), to_date('10-12-2022', 'DD-MM-YYYY'));  
INSERT INTO TRASEE VALUES (TRASEE_SECV.NEXTVAL, '33765', '48768', 16, 13, 21,  
to_date('16-10-2022', 'DD-MM-YYYY'), to_date('16-10-2022', 'DD-MM-YYYY'));  
INSERT INTO TRASEE VALUES (TRASEE_SECV.NEXTVAL, '33445', '45367', 17, 26, 13,  
to_date('18-06-2022', 'DD-MM-YYYY'), to_date('18-06-2022', 'DD-MM-YYYY'));
```

```
SELECT * FROM VERIFICA_BILET;
```

```
INSERT INTO VERIFICA_BILET VALUES (14, 10);
```

```
INSERT INTO VERIFICA_BILET VALUES (11, 11);
```

```
INSERT INTO VERIFICA_BILET VALUES (22, 11);
```

```
INSERT INTO VERIFICA_BILET VALUES (18, 12);
```

```
INSERT INTO VERIFICA_BILET VALUES (12, 12);
```

```
INSERT INTO VERIFICA_BILET VALUES (19, 13);
```

```
INSERT INTO VERIFICA_BILET VALUES (21, 13);
```

```
INSERT INTO VERIFICA_BILET VALUES (23, 14);
```

```
INSERT INTO VERIFICA_BILET VALUES (15, 15);
```

```
INSERT INTO VERIFICA_BILET VALUES (23, 16);
```

```
INSERT INTO VERIFICA_BILET VALUES (17, 16);
```

```
INSERT INTO VERIFICA_BILET VALUES (21, 17);
```

```
INSERT INTO VERIFICA_BILET VALUES (20, 17);
```

```
INSERT INTO VERIFICA_BILET VALUES (13, 18);
```

```
INSERT INTO VERIFICA_BILET VALUES (24, 18);
```

```
INSERT INTO VERIFICA_BILET VALUES (12, 19);
```

```
INSERT INTO VERIFICA_BILET VALUES (25, 19);
```

```
INSERT INTO VERIFICA_BILET VALUES (30, 18);
```

```
INSERT INTO VERIFICA_BILET VALUES (21, 20);
```

```
INSERT INTO VERIFICA_BILET VALUES (20, 20);
```

```
INSERT INTO VERIFICA_BILET VALUES (11, 21);
```

```
INSERT INTO VERIFICA_BILET VALUES (19, 22);
```

```
INSERT INTO VERIFICA_BILET VALUES (23, 22);
```

```
INSERT INTO VERIFICA_BILET VALUES (14, 23);
```

```
-----  
-----  
  
CREATE SEQUENCE REZERVARI_SECV
```

```
START WITH 10
```

```
INCREMENT BY 1
```

```
MAXVALUE 9999
```

```
NOCYCLE;
```

```
SELECT * FROM REZERVA_BILET;
```

```
INSERT INTO REZERVA_BILET VALUES (10, 10, 11, REZERVARI_SECV.NEXTVAL, '33445',  
'33267', 20);
```

```
INSERT INTO REZERVA_BILET VALUES (11, 10, 14, REZERVARI_SECV.NEXTVAL, '33445',  
'33267', 30);
```

```

INSERT INTO REZERVA_BILET VALUES (10, 10, 33, REZERVARI_SECV.NEXTVAL, '33445',
'33267', 20);

INSERT INTO REZERVA_BILET VALUES (12, 11, 12, REZERVARI_SECV.NEXTVAL, '27732',
'45367', 60);
INSERT INTO REZERVA_BILET VALUES (12, 11, 37, REZERVARI_SECV.NEXTVAL, '27732',
'45367', 60);
INSERT INTO REZERVA_BILET VALUES (13, 11, 40, REZERVARI_SECV.NEXTVAL, '27732',
'45367', 70);

INSERT INTO REZERVA_BILET VALUES (10, 12, 15, REZERVARI_SECV.NEXTVAL, '27765',
'33444', 40);
INSERT INTO REZERVA_BILET VALUES (10, 12, 30, REZERVARI_SECV.NEXTVAL, '27765',
'33444', 40);
INSERT INTO REZERVA_BILET VALUES (13, 12, 41, REZERVARI_SECV.NEXTVAL, '27765',
'33652', 90);

INSERT INTO REZERVA_BILET VALUES (10, 13, 13, REZERVARI_SECV.NEXTVAL, '33765',
'45565', 35);
INSERT INTO REZERVA_BILET VALUES (10, 13, 33, REZERVARI_SECV.NEXTVAL, '33765',
'45565', 35);
INSERT INTO REZERVA_BILET VALUES (14, 13, 38, REZERVARI_SECV.NEXTVAL, '33765',
'45565', 85);

INSERT INTO REZERVA_BILET VALUES (10, 14, 10, REZERVARI_SECV.NEXTVAL, '48768',
'48898', 50);
INSERT INTO REZERVA_BILET VALUES (12, 14, 12, REZERVARI_SECV.NEXTVAL, '48768',
'48769', 65);
INSERT INTO REZERVA_BILET VALUES (12, 14, 39, REZERVARI_SECV.NEXTVAL, '48768',
'48769', 65);

INSERT INTO REZERVA_BILET VALUES (10, 15, 17, REZERVARI_SECV.NEXTVAL, '33234',
'45325', 40);
INSERT INTO REZERVA_BILET VALUES (11, 15, 16, REZERVARI_SECV.NEXTVAL, '33234',
'45325', 50);
INSERT INTO REZERVA_BILET VALUES (11, 15, 34, REZERVARI_SECV.NEXTVAL, '33234',
'45325', 50);

INSERT INTO REZERVA_BILET VALUES (10, 16, 14, REZERVARI_SECV.NEXTVAL, '48768',
'33654', 40);
INSERT INTO REZERVA_BILET VALUES (10, 16, 31, REZERVARI_SECV.NEXTVAL, '48768',
'33444', 40);
INSERT INTO REZERVA_BILET VALUES (10, 16, 32, REZERVARI_SECV.NEXTVAL, '48768',
'33444', 40);

```

```

INSERT INTO REZERVA_BILET VALUES (12, 17, 15, REZERVARI_SECV.NEXTVAL, '45565',
'48768', 75);
INSERT INTO REZERVA_BILET VALUES (12, 17, 37, REZERVARI_SECV.NEXTVAL, '45565',
'48768', 75);
INSERT INTO REZERVA_BILET VALUES (13, 17, 38, REZERVARI_SECV.NEXTVAL, '45565',
'48768', 85);

INSERT INTO REZERVA_BILET VALUES (10, 18, 13, REZERVARI_SECV.NEXTVAL, '33444',
'48769', 50);
INSERT INTO REZERVA_BILET VALUES (11, 18, 33, REZERVARI_SECV.NEXTVAL, '33444',
'48769', 60);
INSERT INTO REZERVA_BILET VALUES (14, 18, 36, REZERVARI_SECV.NEXTVAL, '33444',
'48768', 80);

INSERT INTO REZERVA_BILET VALUES (10, 19, 12, REZERVARI_SECV.NEXTVAL, '27765',
'48898', 50);
INSERT INTO REZERVA_BILET VALUES (10, 19, 17, REZERVARI_SECV.NEXTVAL, '27765',
'48898', 50);
INSERT INTO REZERVA_BILET VALUES (10, 19, 39, REZERVARI_SECV.NEXTVAL, '27765',
'45565', 50);

INSERT INTO REZERVA_BILET VALUES (10, 20, 33, REZERVARI_SECV.NEXTVAL, '45565',
'45367', 55);
INSERT INTO REZERVA_BILET VALUES (11, 20, 34, REZERVARI_SECV.NEXTVAL, '45565',
'27732', 65);
INSERT INTO REZERVA_BILET VALUES (11, 20, 41, REZERVARI_SECV.NEXTVAL, '45565',
'27765', 65);

INSERT INTO REZERVA_BILET VALUES (10, 21, 35, REZERVARI_SECV.NEXTVAL, '33267',
'27732', 30);
INSERT INTO REZERVA_BILET VALUES (12, 21, 38, REZERVARI_SECV.NEXTVAL, '33267',
'27732', 45);
INSERT INTO REZERVA_BILET VALUES (12, 21, 10, REZERVARI_SECV.NEXTVAL, '33267',
'27732', 45);

INSERT INTO REZERVA_BILET VALUES (10, 22, 12, REZERVARI_SECV.NEXTVAL, '33765',
'48768', 40);
INSERT INTO REZERVA_BILET VALUES (13, 22, 35, REZERVARI_SECV.NEXTVAL, '33765',
'48768', 65);
INSERT INTO REZERVA_BILET VALUES (14, 22, 36, REZERVARI_SECV.NEXTVAL, '33765',
'48768', 75);

INSERT INTO REZERVA_BILET VALUES (10, 23, 17, REZERVARI_SECV.NEXTVAL, '33445',
'45367', 40);

```

```

INSERT INTO REZERVA_BILET VALUES (12, 23, 30, REZERVARI_SECV.NEXTVAL, '33445',
'45367', 60);
INSERT INTO REZERVA_BILET VALUES (10, 23, 31, REZERVARI_SECV.NEXTVAL, '33445',
'45367', 40);

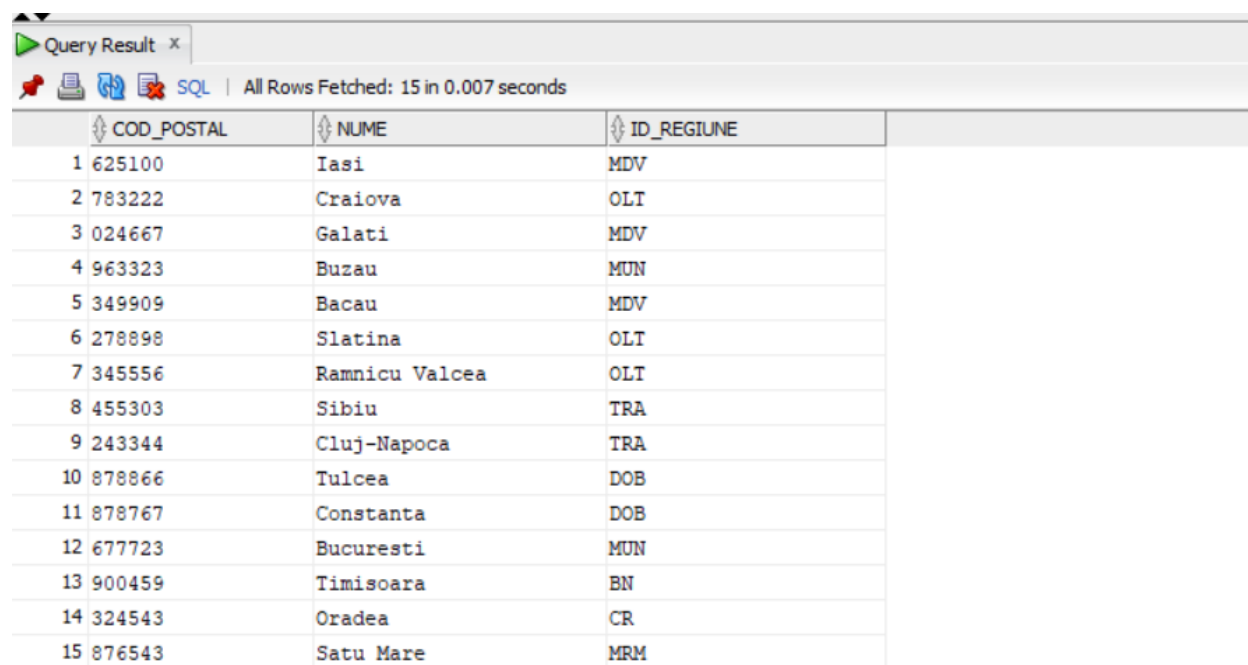
SELECT * FROM GARI;

```

Tabel 1 – GĂRI

COD_SIRUES	NUME	ADRESA	TELEFON	COD_POSTAL_ORAS
1 27732	Gara de Nord Bucuresti	Soseaua Bucuresti 7	0256022608	677723
2 27765	Gara Bucuresti Baneasa	Soseaua Baneasa 15	0232312111	677723
3 33444	Gara Craiova Dolj	Soseaua Craiova 18	0388737872	783222
4 33445	Gara Galati	Soseaua Galati 15	0243435434	024667
5 33234	Gara Buzau	Soseaua Buzau 5	0245465566	963323
6 33267	Gara Bacau	Soseaua Bacau 9	0344434345	349909
7 33654	Gara Slatina	Soseaua Slatina 12	0344353267	278898
8 33652	Gara Ramnicu Valcea	Soseaua Ramnicu Valcea 11	0376755565	345556
9 33765	Gara Sibiu	Soseaua Sibiu 13	0398765432	455303
10 45565	Gara Cluj-Napoca	Soseaua Cluj 19	0467576657	243344
11 45325	Gara Tulcea	Soseaua Tulcea 3	0468765467	878866
12 45367	Gara Constanta	Soseaua Constanta 6	0567575567	878767
13 48768	Gara Timisoara	Soseaua Timisoara 13	0623343434	900459
14 48769	Gara Oradea	Soseaua Oradea 8	0676664645	324543
15 48898	Gara Satu Mare	Soseaua Satu Mare 4	0676687897	876543

Tabel 2 – ORAȘE

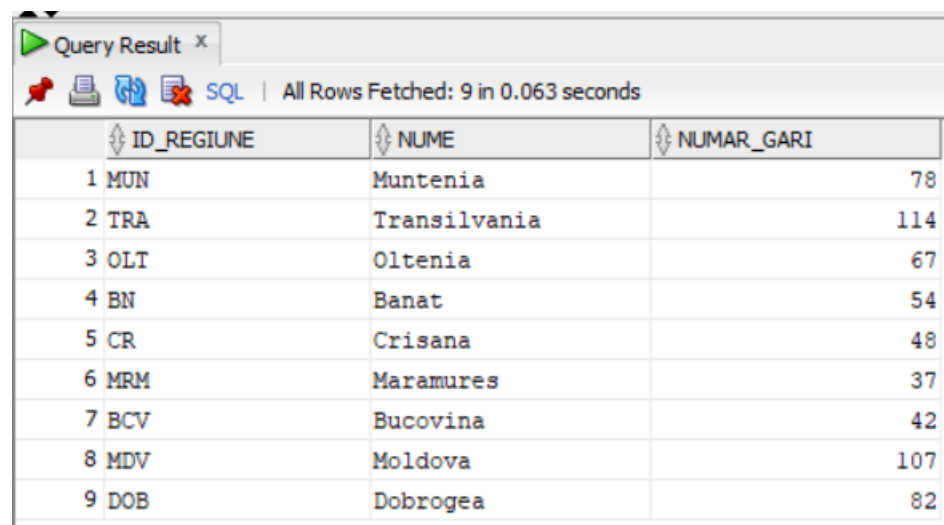


Query Result x

SQL | All Rows Fetched: 15 in 0.007 seconds

	COD_POSTAL	NUME	ID_REGIUNE
1	625100	Iasi	MDV
2	783222	Craiova	OLT
3	024667	Galati	MDV
4	963323	Buzau	MUN
5	349909	Bacau	MDV
6	278898	Slatina	OLT
7	345556	Ramnicu Valcea	OLT
8	455303	Sibiu	TRA
9	243344	Cluj-Napoca	TRA
10	878866	Tulcea	DOB
11	878767	Constanta	DOB
12	677723	Bucuresti	MUN
13	900459	Timisoara	BN
14	324543	Oradea	CR
15	876543	Satu Mare	MRM

Tabel 3 – REGIUNI



Query Result x

SQL | All Rows Fetched: 9 in 0.063 seconds

	ID_REGIUNE	NUME	NUMAR_GARI
1	MUN	Muntenia	78
2	TRA	Transilvania	114
3	OLT	Oltenia	67
4	BN	Banat	54
5	CR	Crisana	48
6	MRM	Maramures	37
7	BCV	Bucovina	42
8	MDV	Moldova	107
9	DOB	Dobrogea	82

Tabel 4 – TRASEE


ID_TRASEU	COD_GARA_PLEcare	COD_GARA_SOSIRE	ID_CONDUCTOR_PRINCIPAL	ID_CONDUCTOR_SECUNDAR	ID_TREN	DATA_PLEcare	DATA_SOSIRE
1	10 33445	33267	17	18	12	23-OCT-22	23-OCT-22
2	11 27732	45367	14	26	22	10-JUL-22	10-JUL-22
3	12 27765	33652	13	20	14	15-NOV-22	15-NOV-22
4	13 33765	45565	23	24	15	07-APR-22	07-APR-22
5	14 48768	48898	28	24	18	25-OCT-22	26-OCT-22
6	15 33234	45325	19	21	11	19-MAR-22	19-MAR-22
7	16 48768	33654	16	28	17	17-OCT-22	17-OCT-22
8	17 45565	48768	24	16	26	24-SEP-22	24-SEP-22
9	18 33444	48769	16	28	14	27-OCT-22	27-OCT-22
10	19 27765	48898	12	13	10	13-OCT-22	13-OCT-22
11	20 45565	45367	24	26	24	09-AUG-22	10-AUG-22
12	21 33267	27732	18	15	16	10-DEC-22	10-DEC-22
13	22 33765	48768	16	13	21	16-OCT-22	16-OCT-22
14	23 33445	45367	17	26	13	18-JUN-22	18-JUN-22

Tabel 5 – TRENURI

ID_TREN	ID_COMPANIE	NUMAR_LOCURI	NUMAR_VAGOANE
1	10	1	240
2	11	1	220
3	12	1	200
4	13	1	220
5	14	1	160
6	15	2	180
7	16	2	200
8	17	3	160
9	18	3	180
10	19	1	200
11	20	1	220
12	21	4	210
13	22	1	240
14	23	1	220
15	24	5	180
16	25	1	160
17	26	5	140
18	27	1	150
19	28	4	200

Tabel 6 – CONDUCTORI

Script Output x Query Result x

 SQL | All Rows Fetched: 18 in 0.018 seconds

	ID_CONDUCTOR	COD_GARA	NUME	PRENUME	TELEFON	DATA_ANGAJARII	SALARIU
1	11	27765	Popescu	Ion	0766749327	07-DEC-20	4500
2	12	27765	Radoiu	Vlad	0766435557	03-NOV-21	3800
3	13	27765	Ionescu	George	0766456445	07-OCT-19	4700
4	14	27732	Florea	Cosmin	0745436673	10-FEB-20	4100
5	15	27732	Dumitru	Denis	0749876656	12-APR-20	3900
6	16	33444	Urzeala	Andrei	0756655675	06-JUL-18	5400
7	17	33445	Teodorescu	Tudor	0723303042	08-SEP-18	2300
8	18	33267	Costache	Gigel	0704375723	10-NOV-17	3400
9	19	33234	Ene	Sergiu	0723438446	04-MAY-17	4700
10	20	33652	Popa	Alexandru	0798666743	10-OCT-16	6000
11	21	45325	Tudose	Petru	0736664324	06-AUG-16	3500
12	22	45325	Moraru	Vasile	0746885480	04-JUL-16	4000
13	23	33765	Dragan	Mihai	0754566643	06-JUN-15	4600
14	24	45565	Rusu	Gigel	0796564335	06-MAR-15	3700
15	25	45325	Matei	Alexandru	0766788312	23-APR-14	3900
16	26	45367	Stanciu	Marian	0712434112	25-JUL-14	4100
17	27	45325	Dedu	Andrei	0789555732	13-NOV-12	2600
18	28	48898	Lengher	Ionut	0708964899	27-OCT-13	4300

Tabel 7 – CONTROLORI

Script Output x Query Result x

SQL | All Rows Fetched: 17 in 0.032 seconds

ID_CONTROLOR	COD_GARA	NUME	PRENUME	TELEFON	DATA_ANGAJARII	SALARIU
1	10 27732	Georgescu	Ion	0766723327	07-NOV-20	4000
2	11 27732	Panescu	Florin	0735656785	09-OCT-18	4100
3	12 27765	Florescu	Mihnea	0766722327	10-OCT-18	4200
4	13 33444	Deleanu	Ionut	0789723327	12-JUL-16	4300
5	14 33445	Dascalu	David	0766724456	09-DEC-18	3900
6	15 33234	Dragan	Liviu	0766787727	21-SEP-19	3600
7	16 33267	Popescu	Stefan	0734523327	07-MAR-20	3400
8	17 33654	Banu	Marcel	0766722237	07-AUG-19	3900
9	18 33652	Popa	Andrei	0756724237	05-JUL-16	4200
10	19 33765	Andronache	Cosmin	0745524237	11-SEP-17	4100
11	20 45565	Raducu	Mircea	0767724237	10-MAY-17	4000
12	21 45565	Matei	Vlad	0767721137	24-JUN-19	3900
13	22 45367	Rusu	Ionut	0767732335	21-NOV-20	4100
14	23 48768	Costache	Antonio	0723332453	19-OCT-20	4000
15	24 48769	Mihalache	George	0789454323	29-APR-19	3900
16	25 48898	Ionescu	Mihail	0765556787	25-MAY-20	3600
17	30 48768	Ionescu	Marius	0765556745	11-MAY-20	3700

Tabel 8 – COMPANII

Query Result x		
SQL All Rows Fetched: 5 in 0.007 seconds		
ID_COMPANIE	NUME	
1	1 Grup Feroviar Roman	
2	2 Transferoviar Calatori	
3	3 Regio Calatori	
4	4 Softrans	
5	5 Astra Trans Carpatic	

Tabel 9 – CLASE

Query Result x			
SQL All Rows Fetched: 5 in 0.002 seconds			
ID_CLASA	NUME	PRET_ADDITIONAL	FACILITATI
1	10 Clasa I	(null)	(null)
2	11 Clasa II	20 aer	conditionat
3	12 Clasa II pachet exclusive	50 acces	vagon restaurant
4	13 CLASA II pachet confort	60 loc	de dormit
5	14 Clasa II pachet premium	80 acces	vagon restaurant, loc de dormit, scaune rabatabile cu priza type-C

Tabel 10 – PASAGERI

Script Output x Query Result x					
SQL All Rows Fetched: 21 in 0.004 seconds					
ID_PASAGER	NUME	PRENUME	TELEFON	MAIL	DATA_NASTERII
1	10 Negoita	Mirel	0765785348	negoitamirel@yahoo.com	25-MAY-85
2	11 Tudor	Iulian	0733533459	tudoriulian@yahoo.com	12-JUN-78
3	12 Fratila	Catalin	0708393404	fratilacatalin@yahoo.com	05-APR-96
4	13 Munteanu	Mirel	0714729299	munteanumirel@yahoo.com	07-NOV-00
5	14 Moldoveanu	David	0723421367	moldoveanudavid@yahoo.com	06-DEC-97
6	15 Tomescu	Iulian	0768945678	tomesuiulian@yahoo.com	23-AUG-83
7	16 Diaconu	David	0723790210	diaconudavid@yahoo.com	14-MAY-69
8	17 Deaconu	Valeriu	0735464625	deaconuvaleriu@yahoo.com	18-MAR-75
9	50 Paun	Ilie	0774834462	paunilie@yahoo.com	14-SEP-97
10	30 Georgescu	Denis	0776878877	georgescudenis@yahoo.com	20-MAY-02
11	31 Costache	Andrei	0767534558	costacheandrei@yahoo.com	13-JUL-01
12	32 Albu	Iulian	0743647372	albuilulian@yahoo.com	10-OCT-80
13	33 Dumitru	Marius	0778954658	dumitrumarius@yahoo.com	15-OCT-95
14	34 Popescu	Florin	0716342383	popescufloirin@yahoo.com	06-JUL-97
15	35 Paduraru	George	0747433243	padurarugeorge@yahoo.com	14-NOV-79
16	36 Verdes	Silviu	0765897774	verdessilviu@yahoo.com	10-SEP-79
17	37 Cristea	Madelin	0792004221	cristeamadelin@yahoo.com	26-APR-95
18	38 Florea	Cosmin	0734275214	fioreacosmin@yahoo.com	12-OCT-95
19	39 Radu	Stefan	0714421423	radustefan@yahoo.com	15-JAN-85
20	40 Gheorghe	Radu	0789431478	gheorgheradu@yahoo.com	20-APR-93
21	41 Paun	Andrei	0774867862	paunandrei@yahoo.com	23-OCT-00

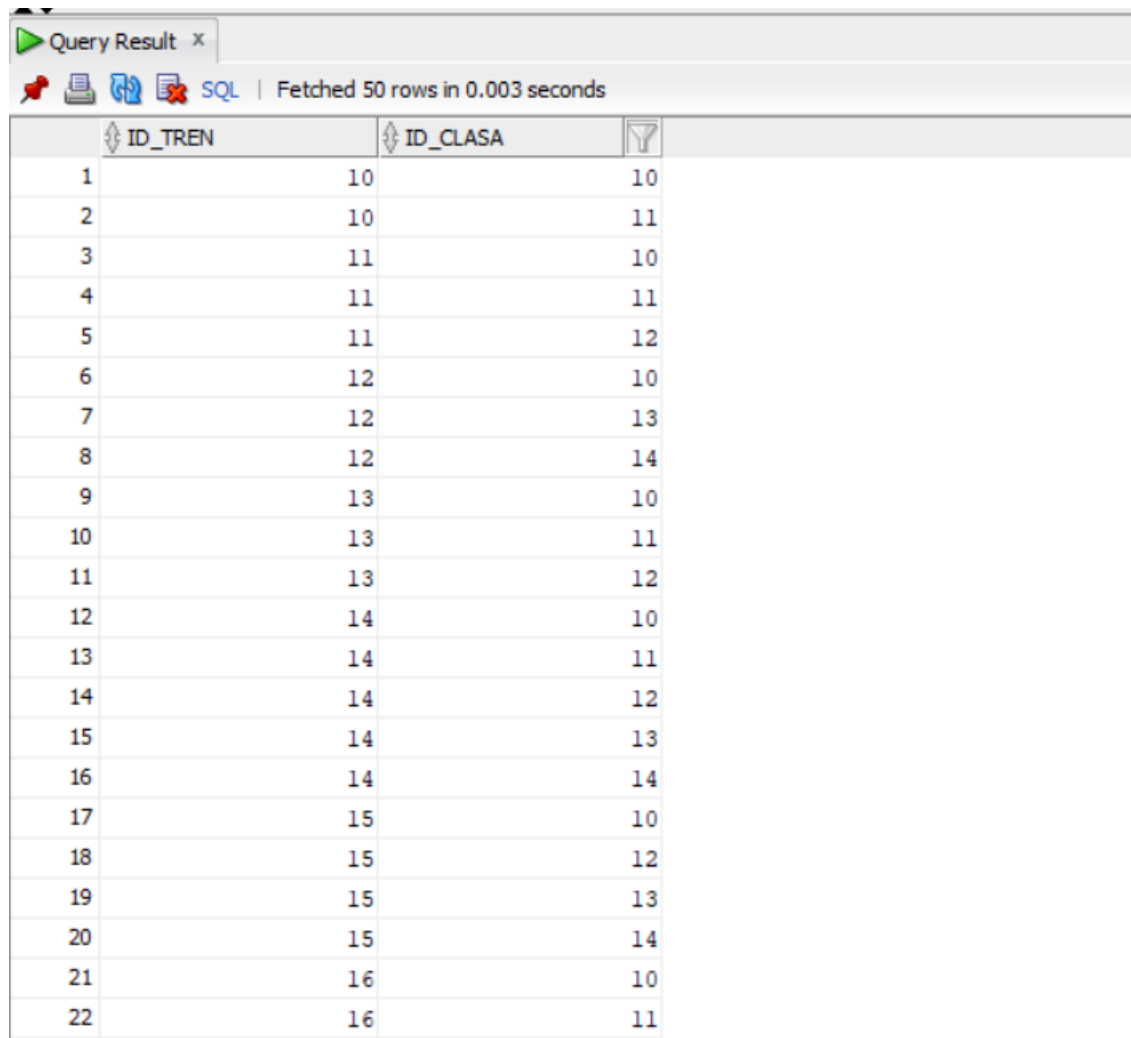
Tabel 11 – VERIFICA_BILET

Worksheet

Query Builder

TRACER TR

Tabel 12 – TRENURI_AU_CLASE



Query Result x

SQL | Fetched 50 rows in 0.003 seconds

	ID_TREN	ID_CLASA	
1	10	10	
2	10	11	
3	11	10	
4	11	11	
5	11	12	
6	12	10	
7	12	13	
8	12	14	
9	13	10	
10	13	11	
11	13	12	
12	14	10	
13	14	11	
14	14	12	
15	14	13	
16	14	14	
17	15	10	
18	15	12	
19	15	13	
20	15	14	
21	16	10	
22	16	11	

Tabel 12 (continuare) – TRENURI_AU_CLASE

Query Result x			
All Rows Fetched: 57 in 0.007 seconds			
	ID_TREN	ID_CLASA	
21	16	10	
22	16	11	
23	17	10	
24	17	13	
25	18	10	
26	18	11	
27	18	12	
28	19	10	
29	19	13	
30	19	14	
31	20	10	
32	20	11	
33	21	10	
34	21	12	
35	21	13	
36	22	10	
37	22	11	
38	22	12	
39	22	13	
40	23	10	
41	23	11	
42	24	10	

Tabel 13 – REZERVA_BILET

ID_CLASA	ID_TRASEU	ID_PASAGER	ID_REZER...	COD_GAR...	COD_GAR...	PRET_BILET
21	10	16	32	30 48768	33444	40
22	12	17	15	31 45565	48768	75
23	10	18	13	34 33444	48769	50
24	11	18	33	35 33444	48769	60
25	14	18	36	36 33444	48768	80
26	10	19	12	37 27765	48898	50
27	10	19	17	38 27765	48898	50
28	10	19	39	39 27765	45565	50
29	10	20	33	40 45565	45367	55
30	11	20	34	41 45565	27732	65
31	11	20	41	42 45565	27765	65
32	10	21	35	43 33267	27732	30
33	12	21	38	44 33267	27732	45
34	12	21	10	45 33267	27732	45
35	10	22	12	46 33765	48768	40
36	13	22	35	47 33765	48768	65
37	14	22	36	48 33765	48768	75
38	10	23	17	49 33445	45367	40
39	12	23	30	50 33445	45367	60
40	10	23	31	51 33445	45367	40
41	12	17	37	54 45565	48768	75
42	13	17	38	55 45565	48768	85

6. Cerința cu subprogram stocat și două tipuri de colecție

```
-- Cerinta 6

-- Sa se afiseze media salariilor conductorilor pentru fiecare gara si numele
garii

CREATE OR REPLACE PROCEDURE cerinta6 IS

    TYPE gara_rec IS RECORD (cod GARI.COD_SIRUES%TYPE, denumire GARI.NUME%TYPE,
salariu CONDUCTORI.SALARIU%TYPE);

    TYPE tablou IS TABLE OF gara_rec;

    TYPE vector IS VARRAY(20) OF CONDUCTORI.SALARIU%TYPE;

    CURSOR crs IS
        SELECT COD_SIRUES
        FROM GARI;

    t tablou := tablou();
    v vector := vector();
    g gara_rec;

BEGIN
    FOR c IN crs LOOP

        SELECT COD_SIRUES, NUME
        INTO g.cod, g.denumire
        FROM GARI
        WHERE c.COD_SIRUES = COD_SIRUES;

        v.EXTEND;
        SELECT AVG(SALARIU)
        INTO v(v.LAST)
        FROM CONDUCTORI
        WHERE COD_GARA = c.COD_SIRUES;

        g.salariu := v(v.LAST);

        t.EXTEND;
        t(t.LAST) := g;

    END LOOP;

END;
```

```

        IF (t(t.LAST).salariu IS NULL) THEN
            DBMS_OUTPUT.PUT_LINE ('Nu avem angajati disponibili in aceasta
gara');
        ELSE
            DBMS_OUTPUT.PUT_LINE ('Pentru gara ' || t(t.LAST).denumire || ' media
salarilor este ' || t(t.LAST).salariu);
        END IF;
    END LOOP;

END cerinta6;
/

EXECUTE cerinta6;

```

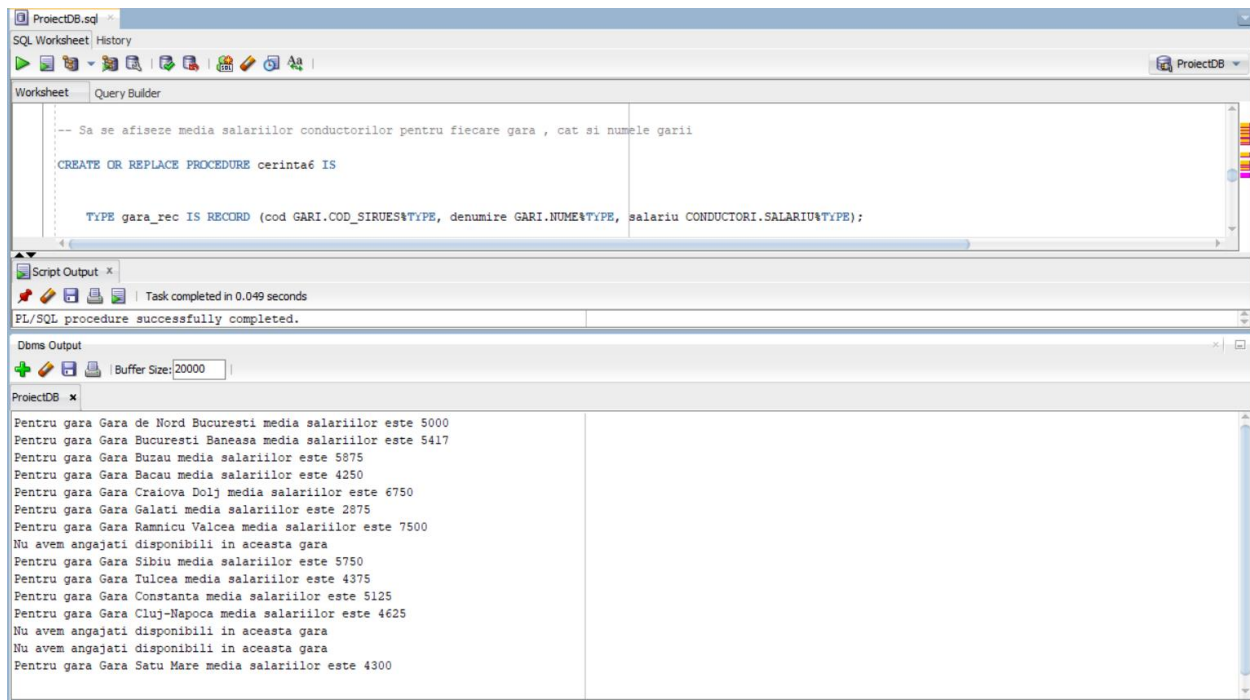


Figura 3 – Cerința 6

7. Cerința cu subprogram stocat și două tipuri de cursoare diferite

```
-- Cerinta 7

-- Sa se mareasca salariul cu 25% conductorilor care lucreaza in regiuni ce
-- contin cel putin 50 de gari

CREATE OR REPLACE PROCEDURE cerinta7 IS

    TYPE tab_regiuni IS TABLE OF REGIUNI.NUME%TYPE;
    t_reg tab_regiuni;

    CURSOR reg IS
        SELECT NUME
        FROM REGIUNI
        WHERE NUMAR_GARI >=50
        ORDER BY NUME;

    CURSOR cond (region_name VARCHAR2) IS
        SELECT * FROM CONDUCTORI
        WHERE COD_GARA IN (SELECT COD_SIRUES FROM GARI WHERE COD_POSTAL_ORAS IN
            (SELECT COD_POSTAL FROM ORASE WHERE ID_REGIUNE =
            (SELECT ID_REGIUNE FROM REGIUNI WHERE NUME LIKE region_name )))
        FOR UPDATE OF SALARIU NOWAIT;

BEGIN
    OPEN reg;
    FETCH reg BULK COLLECT INTO t_reg;
    CLOSE reg;

    FOR r IN t_reg.FIRST..t_reg.LAST LOOP
        FOR c IN cond(t_reg(r)) LOOP
            UPDATE CONDUCTORI
            SET SALARIU = SALARIU + ((SALARIU * 25)/100)
            WHERE CURRENT OF cond;
        END LOOP;
    END LOOP;

END cerinta7;
/
EXECUTE cerinta7;

SELECT * FROM CONDUCTORI;
```


ProiectDB.sql

SQL Worksheet History

Worksheet Query Builder

EXECUTE cerinta7;

SELECT * FROM CONDUCTORI;

Script Output x Query Result x

SQL All Rows Fetched: 18 in 0.02 seconds

ID_CONDUCTOR	COD_GARA	NUME	PRENUME	TELEFON	DATA_ANGAJARII	SALARIU
1	11 27765	Popescu	Ion	0766749327	07-DEC-20	5625
2	12 27765	Radoiu	Vlad	0766435557	03-NOV-21	4750
3	13 27765	Ionescu	George	0766456445	07-OCT-19	5875
4	14 27732	Florea	Cosmin	0745436673	10-FEB-20	5125
5	15 27732	Dumitru	Denis	0749876656	12-APR-20	4875
6	16 33444	Urseala	Andrei	0756655675	06-JUL-18	6750
7	17 33445	Teodorescu	Tudor	0723303042	08-SEP-18	2875
8	18 33267	Costache	Gigel	0704375723	10-NOV-17	4250
9	19 33234	Ene	Sergiu	0723438446	04-MAY-17	5875
10	20 33652	Popa	Alexandru	0798666743	10-OCT-16	7500
11	21 45325	Tudose	Petru	0736664324	06-AUG-16	4375
12	22 45325	Moraru	Vasile	0746885480	04-JUL-16	5000
13	23 33765	Dragan	Mihai	0754566643	06-JUN-15	5750
14	24 45565	Rusu	Gigel	0796564335	06-MAR-15	4625
15	25 45325	Matei	Alexandru	0766788312	23-APR-14	4875
16	26 45367	Stanciu	Marian	0712434112	25-JUL-14	5125
17	27 45325	Dedu	Andrei	0789555732	13-NOV-12	3250
18	28 48898	Lengher	Ionut	0708964899	27-OCT-13	4300

Figura 4 - Cerința 7

8. Cerința cu funcție și 3 tabele într-o comandă

```
-- Cerinta 8
-- Sa se afiseze costul rezervarilor facute de un pasager unde numele sau este
dat ca input.
-- Costul rezervarilor presupune suma biletelor achizitionate de acesta,
adaugandu-se preturile aditionale in functie de clasa la care s-a facut
rezervarea.
-- Sa se trateze cazurile in care avem prea multi pasageri cu acelasi nume, in
care nu exista persoana data ca input si cel in care nu s-au facut rezervari de
persoana data.
```

```
SELECT * FROM PASAGERI;
SELECT * FROM REZERVA_BILET
WHERE ID_PASAGER = 15;
```

```
CREATE OR REPLACE FUNCTION cerinta8 (input_name PASAGERI.NUME%TYPE)
RETURN REZERVA_BILET.PRET_BILET%TYPE IS
```

```
    counter NUMBER;
    final_price REZERVA_BILET.PRET_BILET%TYPE;
    no_persons EXCEPTION;
    too_many_persons EXCEPTION;
    no_reservations EXCEPTION;
```

```
BEGIN
```

```
    SELECT COUNT(*) INTO counter
    FROM PASAGERI
    WHERE LOWER(input_name) = LOWER(NUME);
```

```
    IF (counter = 0)
    THEN RAISE no_persons;
    ELSIF (counter > 1)
    THEN RAISE too_many_persons;
    END IF;
```

```
    SELECT COUNT(*) INTO counter
    FROM REZERVA_BILET INNER JOIN PASAGERI USING (ID_PASAGER)
    WHERE LOWER(PASAGERI.NUME) = LOWER(input_name);
```

```

IF (counter = 0)
THEN RAISE no_reservations;
END IF;

SELECT SUM (PRET_BILET + NVL(PRET_ADITIOINAL,0))
INTO final_price
FROM REZERVA_bilet JOIN CLASE USING (ID_CLASA) JOIN PASAGERI USING
(ID_PASAGER)
WHERE LOWER(input_name) = LOWER(PASAGERI.NUME);

RETURN final_price;

EXCEPTION
    WHEN no_persons THEN
--         RETURN -1;
--         DBMS_OUTPUT.PUT_LINE('Nu exista persoane');
        RAISE_APPLICATION_ERROR(-20015,'Nu exista persoane cu numele dat');

    WHEN too_many_persons THEN
--         RETURN -2;
--         DBMS_OUTPUT.PUT_LINE('Prea multe persoane');
        RAISE_APPLICATION_ERROR(-20016,'Prea multe persoane cu acelasi nume');

    WHEN no_reservations THEN
--         RETURN -3;
--         DBMS_OUTPUT.PUT_LINE('Nu exista rezervari');
        RAISE_APPLICATION_ERROR(-20017,'Nu exista rezervari cu numele dat');

END cerinta8;
/

SELECT cerinta8('Tomescu') FROM DUAL;
-- un bilet de 40 RON fara cost aditional + un bilet de 75 RON cu un cost
aditional de 50 RON = 165 RON suma rezervarilor

SELECT cerinta8('Besliu') FROM DUAL;
-- nu exista acest nume in baza de date

SELECT cerinta8('Paun') FROM DUAL;

```

```
-- exista doua persoane cu acest nume
```

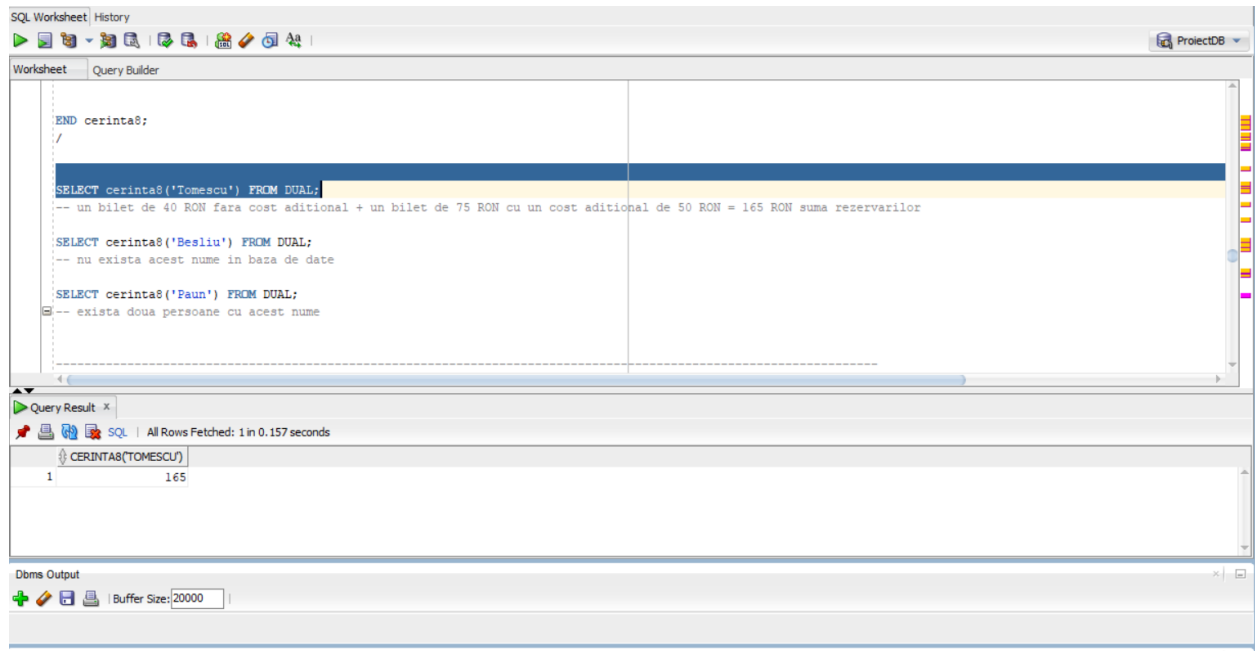


Figura 5 – Cerința 8

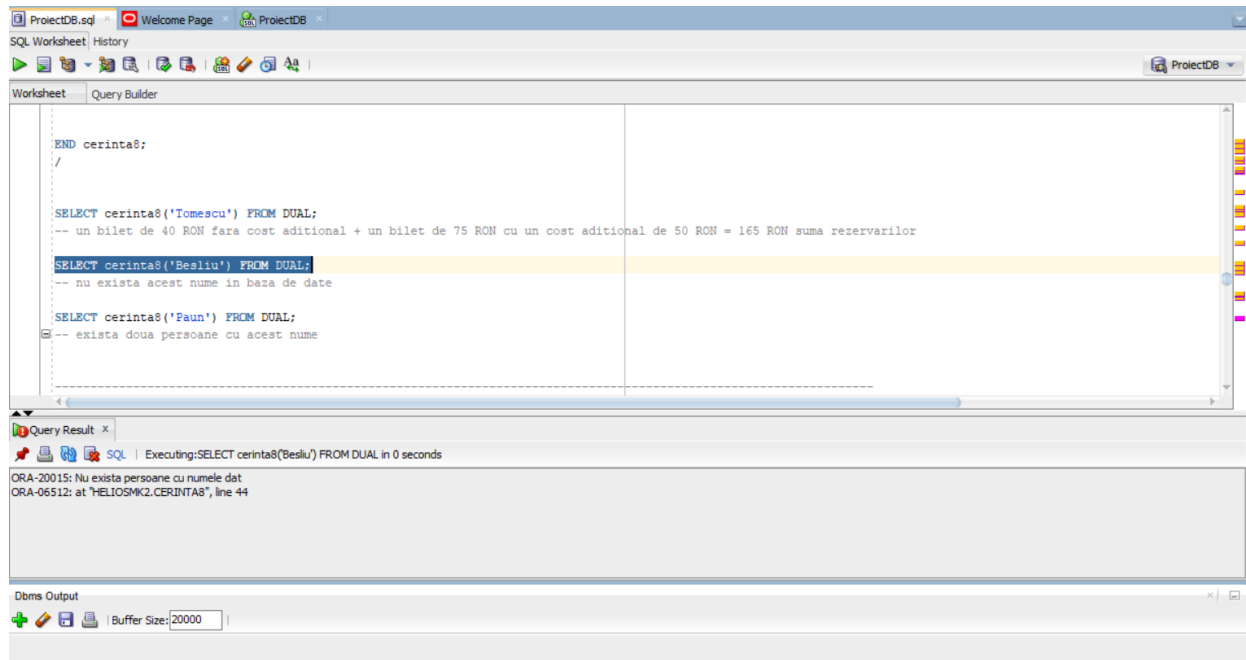


Figura 6 – Cerința 8

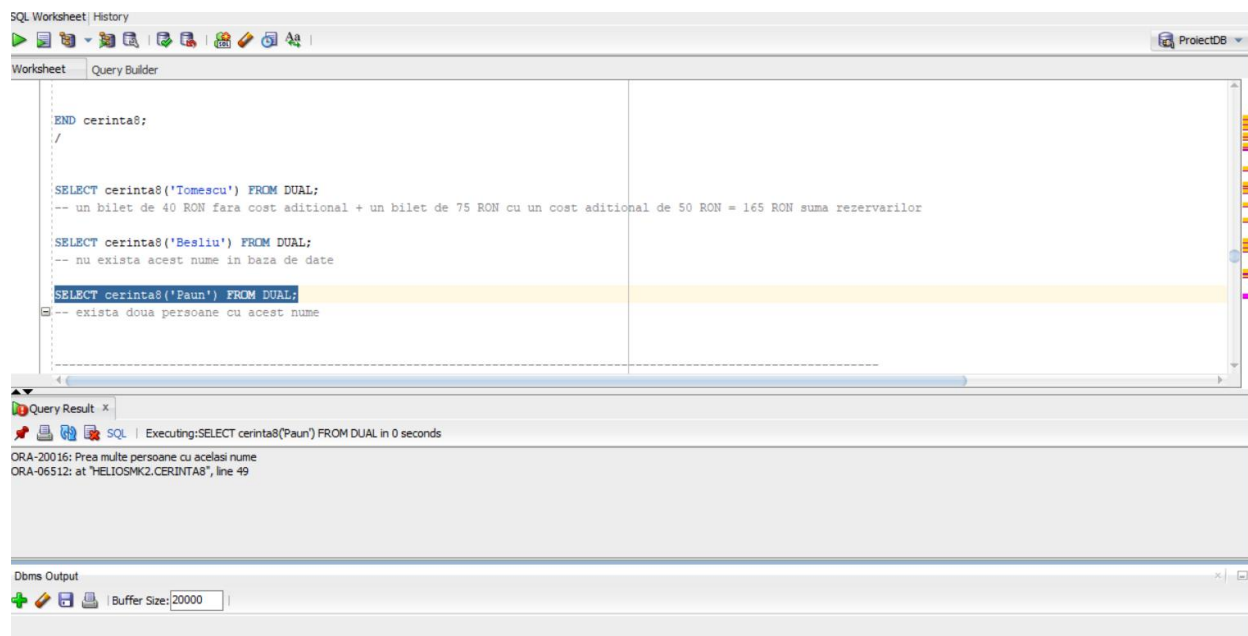


Figura 7 – Cerința 8

9. Cerința cu procedură și 5 tabele într-o comandă

```
-- Cerinta 9
-- Se da numele unui controlor ca input.
-- Sa se afiseze numarul de trasee unde acesta a verificat bilete, gara, orasul
si regiunea de unde vine.
-- Sa se trateze cazurile in care exista prea multi controlori cu numele dat ca
input sau nu exista controlori cu numele dat.
```

```
SELECT * FROM VERIFICA_BILET;
SELECT * FROM CONTROLORI;
SELECT * FROM GARI;
SELECT * FROM REGIUNI;
```

```
CREATE OR REPLACE PROCEDURE cerinta9 (input_name CONTROLORI.NUME%TYPE) IS
```

```
    reg_name REGIUNI.NUME%TYPE;
    ors_name ORASE.NUME%TYPE;
    gr_name GARI.NUME%TYPE;
    nr_trasee NUMBER;
```

```
BEGIN
```

```
    SELECT COUNT(vf.ID_TRASEU), gr.NUME, ors.NUME, reg.NUME
    INTO nr_trasee, gr_name, ors_name, reg_name
    FROM VERIFICA_BILET vf RIGHT JOIN CONTROLORI cn ON (cn.ID_CONTROLOR =
vf.ID_CONTROLOR)
    JOIN GARI gr ON (cn.COD_GARA = gr.COD_SIRUES)
    JOIN ORASE ors ON (ors.COD_POSTAL = gr.COD_POSTAL_ORAS)
    JOIN REGIUNI reg ON (reg.ID_REGIUNE = ors.ID_REGIUNE)
    WHERE LOWER(input_name) = LOWER(cn.NUME)
    GROUP BY gr.NUME, ors.NUME, reg.NUME;

    IF (nr_trasee = 1)
    THEN DBMS_OUTPUT.PUT_LINE('Controlorul ' || input_name || ' a verificat
bilete pe un singur traseu si apartine garii ' || gr_name || ' din orasul ' ||
ors_name || ', regiunea ' || reg_name);
    ELSIF (nr_trasee > 1)
    THEN DBMS_OUTPUT.PUT_LINE('Controlorul ' || input_name || ' a verificat
bilete pe ' || nr_trasee || ' trasee si apartine garii ' || gr_name || ' din
orasul ' || ors_name || ', regiunea ' || reg_name);
```

```

        ELSIF (nr_trasee = 0)
        THEN DBMS_OUTPUT.PUT_LINE('Controlorul ' || input_name || ' nu a verificat
bilete pe niciun traseu');
        END IF;

EXCEPTION

        WHEN TOO_MANY_ROWS
        THEN RAISE_APPLICATION_ERROR(-20008, 'Prea multe persoane cu acelasi nume dat
ca input');
        WHEN NO_DATA_FOUND
        THEN RAISE_APPLICATION_ERROR(-20009, 'Nu exista persoane cu numele dat ca
input');
END cerinta9;
/

-- nu a verificat niciun bilet
EXECUTE cerinta9('Georgescu');

-- nu exista controlor cu acest nume
EXECUTE cerinta9('Orlando');

-- exista 2 persoane cu acest nume
EXECUTE cerinta9('Ionescu');

```

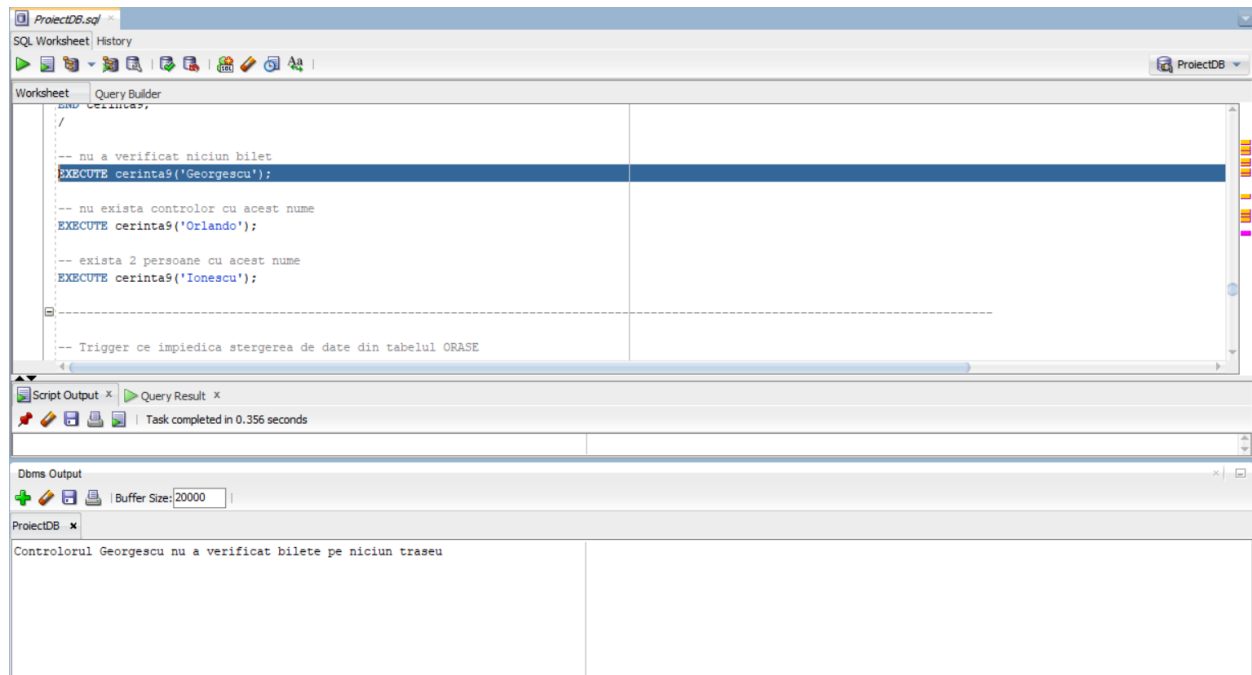


Figura 8 – Cerința 9

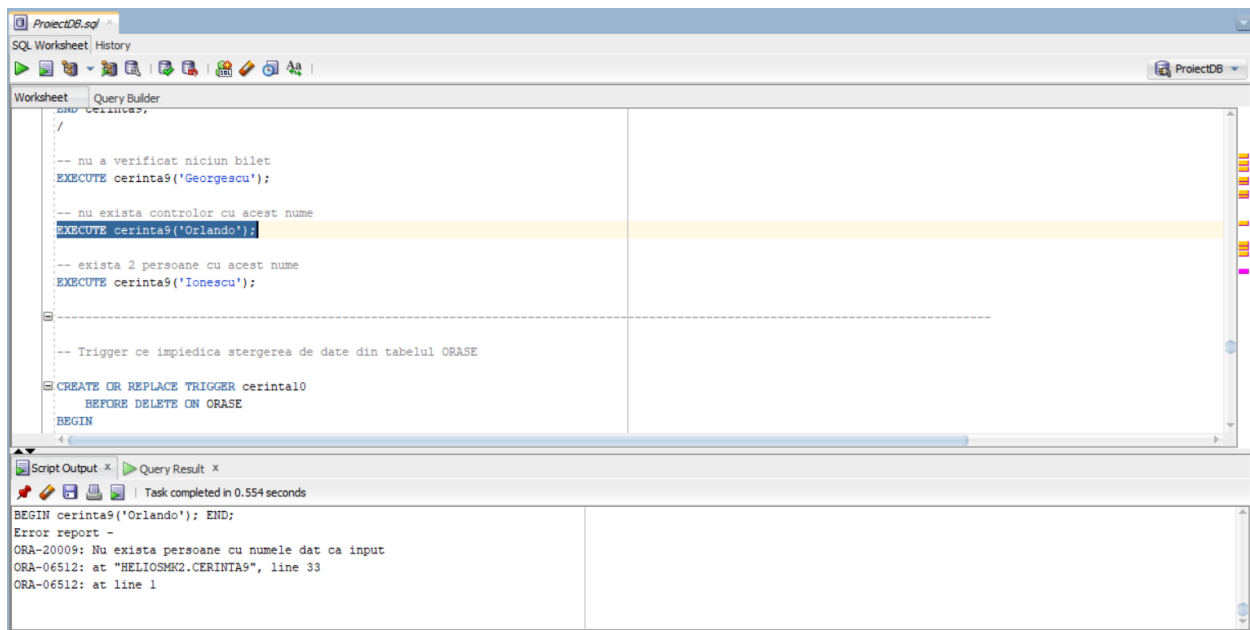


Figura 9 – Cerința 9

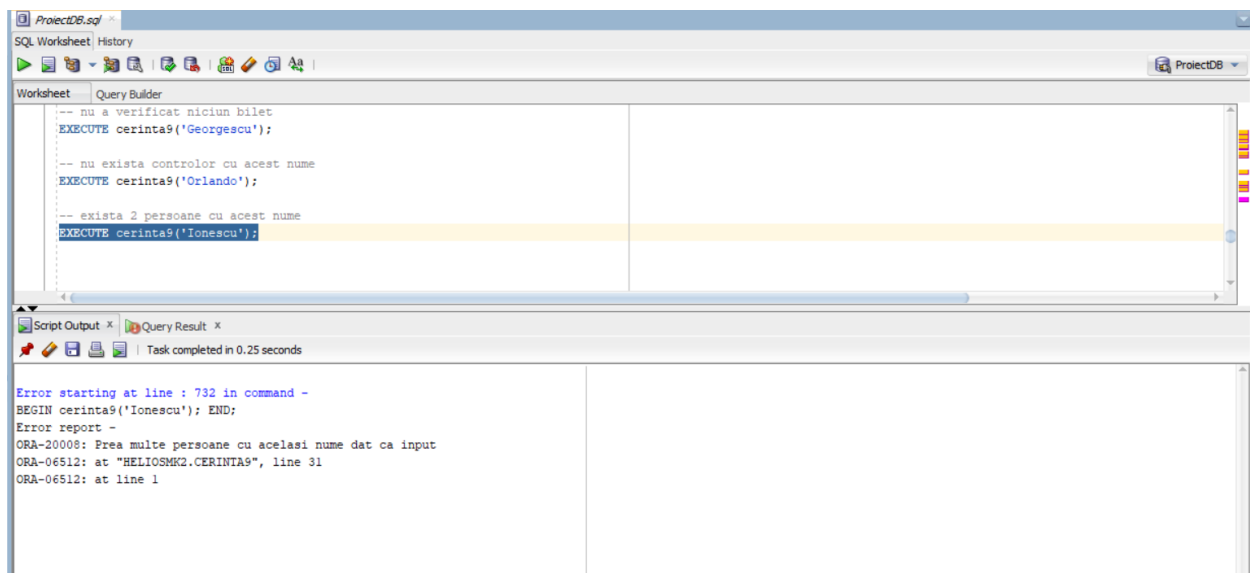


Figura 10 – Cerința 9

10. Trigger de tip LMD la nivel de comandă

```
-- Cerinta 10
-- Trigger ce impiedica stergerea de date din tabelul ORASE

CREATE OR REPLACE TRIGGER cerinta10
  BEFORE DELETE ON ORASE
BEGIN
  RAISE_APPLICATION_ERROR(-20011, 'Nu este permisa stergerea de date din
tabelul ORASE');
END;
/

DELETE FROM ORASE
WHERE NUME = 'Craiova';
```

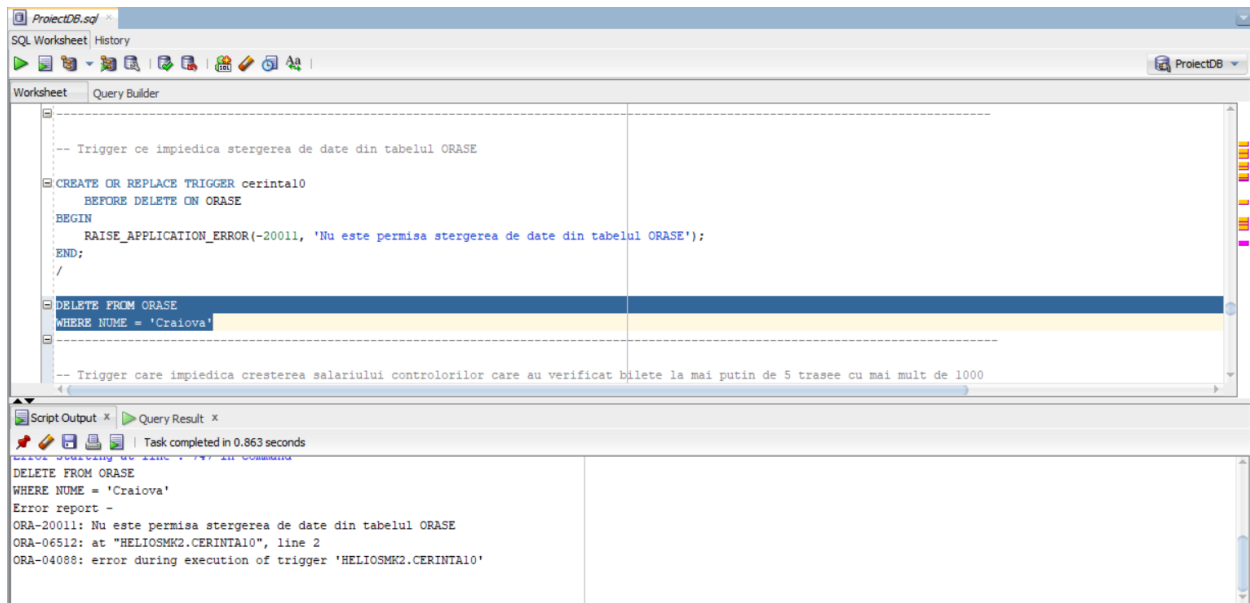


Figura 11 – Cerința 10

11. Trigger de tip LMD la nivel de linie

```
-- Cerinta 11
-- Trigger care impiedica cresterea salariului controlorilor care au verificat
bilete la mai putin de 5 trasee cu mai mult de 1000

CREATE OR REPLACE TRIGGER cerinta11
  BEFORE UPDATE ON CONTROLORI
  FOR EACH ROW
DECLARE
  nr_trasee NUMBER :=0;
BEGIN
  SELECT COUNT(*) INTO nr_trasee
  FROM VERIFICA_BILET
  WHERE ID_CONTROLOR = :OLD.ID_CONTROLOR;

  IF(:NEW.SALARIU > :OLD.SALARIU +1000) AND (nr_trasee < 5)
  THEN RAISE_APPLICATION_ERROR (-20012, 'Salariul nu poate fi marit cu mai mult
de 1000 unui controlor care a verificat bilete la mai putin de 5 trasee');
  END IF;

END;
/

SELECT * FROM CONTROLORI

UPDATE CONTROLORI
SET SALARIU = 8000
WHERE ID_CONTROLOR = 30;
```

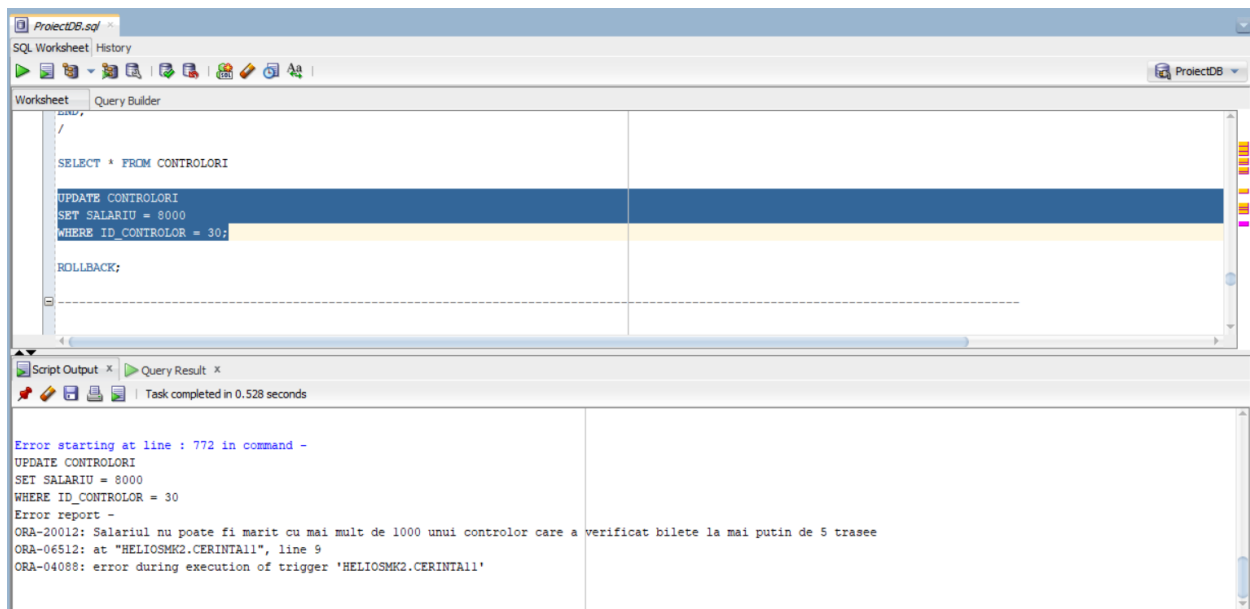


Figura 12 – Cerința 11

12. Trigger de tip LDD

```
-- Cerinta 12
-- Trigger care afiseaza un mesaj in momentul rularii unei comenzi de tip LDD

CREATE OR REPLACE TRIGGER cerinta12
  AFTER CREATE OR ALTER OR DROP ON SCHEMA

BEGIN
  DBMS_OUTPUT.PUT_LINE('S-a rulat o comanda de tip LDD');
END;
/

ALTER TABLE PASAGERI
ADD nr_bagaje NUMBER(2);

ALTER TABLE PASAGERI
DROP COLUMN nr_bagaje;
```

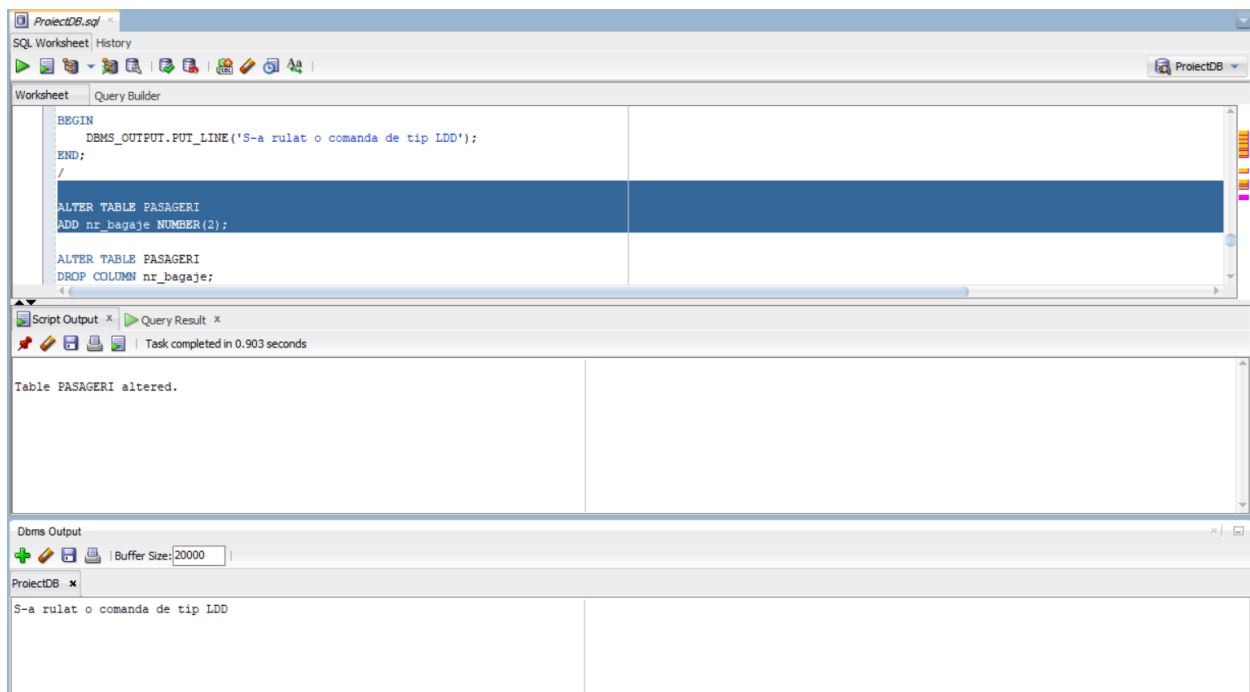


Figura 13 – Cerința 12

13. Pachet cu obiectele din proiect

```
-- Cerinta 13 cu pachet ce contine toate obiectele din cadrul proiectului.

CREATE OR REPLACE PACKAGE cerinta13 AS
    FUNCTION cerinta8 (input_name PASAGERI.NUME%TYPE) RETURN
    REZERVA_BILET.PRET_BILET%TYPE;
    PROCEDURE cerinta6;
    PROCEDURE cerinta7;
    PROCEDURE cerinta9 (input_name CONTROLORI.NUME%TYPE);

END cerinta13;
/
CREATE OR REPLACE PACKAGE BODY cerinta13 AS

    -- costul rezervarilor facute de un pasager unde numele sau este dat ca input

    FUNCTION cerinta8 (input_name PASAGERI.NUME%TYPE)
    RETURN REZERVA_BILET.PRET_BILET%TYPE IS

        counter NUMBER;
        final_price REZERVA_BILET.PRET_BILET%TYPE;

    BEGIN

        SELECT COUNT(*) INTO counter
        FROM PASAGERI
        WHERE LOWER(input_name) = LOWER(NUME);

        IF (counter = 0)
        THEN RAISE_APPLICATION_ERROR(-20001, 'Nu s-au gasit persoane cu numele
dat ca input. ');
        ELIF (counter > 1)
        THEN RAISE_APPLICATION_ERROR ( -20001 , 'S-au gasit prea multe persoane
cu numele dat ca input. ');
        END IF;

        SELECT COUNT(*) INTO counter
        FROM REZERVA_BILET INNER JOIN PASAGERI USING (ID_PASAGER)
        WHERE LOWER(PASAGERI.NUME) = LOWER(input_name);

        IF (counter = 0)
```

```

        THEN RAISE_APPLICATION_ERROR (-20003, 'Nu s-au gasit rezervari pentru
numele dat ca input.');
```

```

    END IF;
```

```

    SELECT SUM (PRET_BILET + NVL(PRET_ADDITIONAL,0))
    INTO final_price
    FROM REZERVA_bilet JOIN CLASE USING (ID_CLASA) JOIN PASAGERI USING
(ID_PASAGER)
```

```

    WHERE LOWER(input_name) = LOWER(PASAGERI.NUME);
```

```

    RETURN final_price;
```

```

END cerinta8;
```

-- media salariilor conductorilor pentru fiecare gara , cat si numele garii

```

PROCEDURE cerinta6 IS
```

```

    TYPE gara_rec IS RECORD (cod GARI.COD_SIRUES%TYPE, denumire
GARI.NUME%TYPE, salariu CONDUCTORI.SALARIU%TYPE);
```

```

    TYPE tablou IS TABLE OF gara_rec;
```

```

    TYPE vector IS VARRAY(20) OF CONDUCTORI.SALARIU%TYPE;
```

```

CURSOR crs IS
```

```

    SELECT COD_SIRUES
    FROM GARI;
```

```

t tablou := tablou();
```

```

v vector := vector();
```

```

g gara_rec;
```

```

BEGIN
```

```

    FOR c IN crs LOOP
```

```

        SELECT COD_SIRUES, NUME
        INTO g.cod, g.denumire
        FROM GARI
        WHERE c.COD_SIRUES = COD_SIRUES;
```

```

        v.EXTEND;
```

```

        SELECT AVG(SALARIU)
```

```

        INTO v(v.LAST)
```

```

        FROM CONDUCTORI
```

```

        WHERE COD_GARA = c.COD_SIRUES;

        g.salariu := v(v.LAST);

        t.EXTEND;
        t(t.LAST) := g;

        IF (t(t.LAST).salariu IS NULL) THEN
            DBMS_OUTPUT.PUT_LINE ('Nu avem angajati disponibili in aceasta
gara');
        ELSE
            DBMS_OUTPUT.PUT_LINE ('Pentru gara ' || t(t.LAST).denumire || '
media salariilor este ' || t(t.LAST).salariu);
        END IF;
    END LOOP;

END cerinta6;

-- marirea salariul cu 25% conductorilor care lucreaza in regiuni ce contin
cel putin 50 de gari

PROCEDURE cerinta7 IS

    CURSOR reg IS
        SELECT NUME
        FROM REGIUNI
        WHERE NUMAR_GARI >=50
        ORDER BY NUME;

    CURSOR cond (region_name VARCHAR2) IS
        SELECT * FROM CONDUCTORI
        WHERE COD_GARA IN (SELECT COD_SIRUES FROM GARI WHERE COD_POSTAL_ORAS
IN
        (SELECT COD_POSTAL FROM ORASE WHERE ID_REGIUNE =
        (SELECT ID_REGIUNE FROM REGIUNI WHERE NUME LIKE region_name )))
        FOR UPDATE OF SALARIU NOWAIT;

BEGIN

    FOR r in reg LOOP
        FOR c in cond(r.NUME) LOOP
            UPDATE CONDUCTORI
            SET SALARIU = SALARIU + ((SALARIU * 25)/100)
            WHERE CURRENT OF cond;
        END LOOP;
    END LOOP;

```

```

        END LOOP;

    END cerinta7;

    -- afisarea numarului de trasee unde un controlor a verificat bilete, gara,
    orasul si regiunea de unde vine.

    PROCEDURE cerinta9 (input_name CONTROLORI.NUME%TYPE) IS

        reg_name REGIUNI.NUME%TYPE;
        ors_name ORASE.NUME%TYPE;
        gr_name GARI.NUME%TYPE;
        nr_trasee NUMBER;

    BEGIN

        SELECT COUNT(ID_TRASEU), gr.NUME, ors.NUME, reg.NUME
        INTO nr_trasee, gr_name, ors_name, reg_name
        FROM VERIFICA_BILET vf RIGHT JOIN CONTROLORI cn ON (vf.ID_CONTROLOR =
cn.ID_CONTROLOR)
        JOIN GARI gr ON (cn.COD_GARA = gr.COD_SIRUES)
        JOIN ORASE ors ON (ors.COD_POSTAL = gr.COD_POSTAL_ORAS)
        JOIN REGIUNI reg ON (reg.ID_REGIUNE = ors.ID_REGIUNE)
        WHERE LOWER(cn.NUME) = LOWER(input_name)
        GROUP BY gr.NUME, ors.NUME, reg.NUME;

        IF (nr_trasee = 1)
            THEN DBMS_OUTPUT.PUT_LINE('Controlorul ' || input_name || ' a verificat
bilete pe un singur traseu si apartine garii ' || gr_name || ' din orasul ' ||
ors_name || ', regiunea ' || reg_name);
            ELIF (nr_trasee > 1)
                THEN DBMS_OUTPUT.PUT_LINE('Controlorul ' || input_name || ' a verificat
bilete pe ' || nr_trasee || ' trasee si apartine garii ' || gr_name || ' din
orasul ' || ors_name || ', regiunea ' || reg_name);
                ELIF (nr_trasee = 0)
                    THEN DBMS_OUTPUT.PUT_LINE('Controlorul ' || input_name || ' nu a
verificat bilete pe niciun traseu');
                    END IF;

        EXCEPTION

            WHEN TOO_MANY_ROWS
                THEN RAISE_APPLICATION_ERROR(-20008, 'Prea multe persoane cu acelasi nume
dat ca input');
    
```



```

        WHEN NO_DATA_FOUND
        THEN RAISE_APPLICATION_ERROR(-20009, 'Nu exista persoane cu numele dat ca
input');
    END cerinta9;

END cerinta13;
/

EXECUTE cerinta13.cerinta6;

EXECUTE cerinta13.cerinta7;
SELECT * FROM CONDUCTORI;

ROLLBACK;

SELECT cerinta13.cerinta8('Tomescu') FROM DUAL;

EXECUTE cerinta13.cerinta9('Georgescu');

```

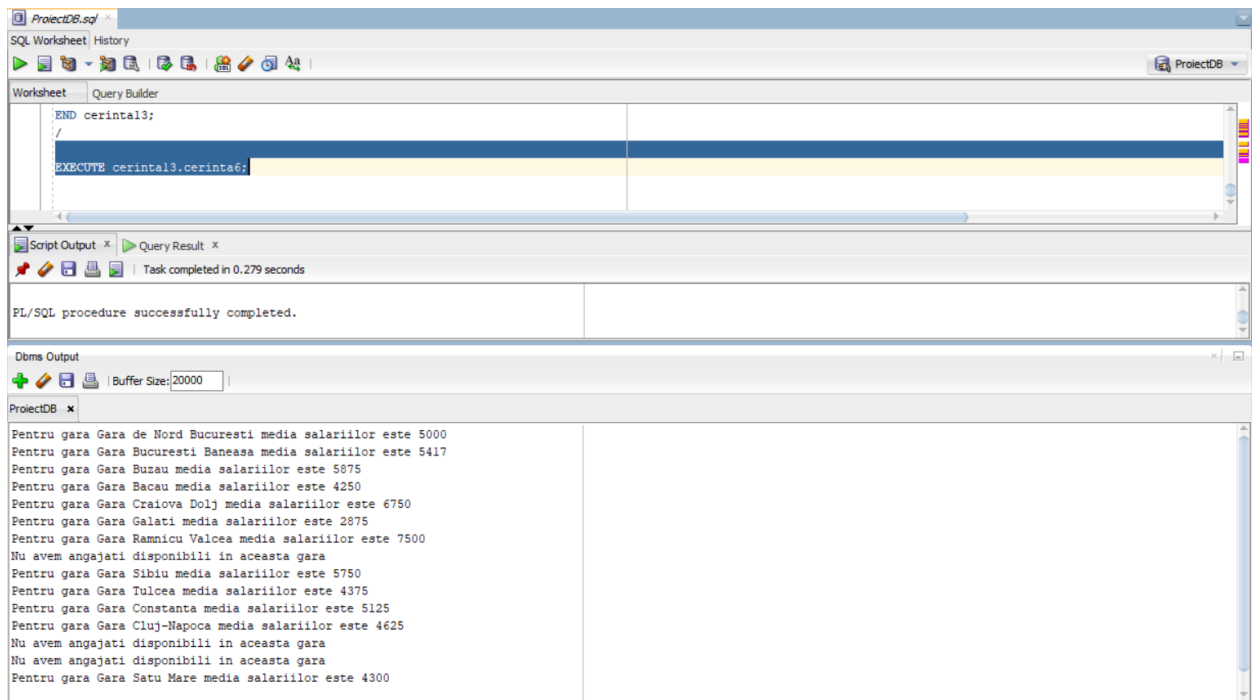


Figura 14 – Cerința 13

ProjectDB.sql

SQL Worksheet History

Worksheet Query Builder

```
EXECUTE cerintal3.cerinta7;
SELECT * FROM CONDUCTORI;
ROLLBACK;
```

Script Output x Query Result x










SQL All Rows Fetched: 18 in 0.036 seconds

ID_CONDUCTOR	COD_GARA	NUME	PRENUME	TELEFON	DATA_ANGAJARII	SALARIU
1	11 27765	Popescu	Ion	0766749327	07-DEC-20	7031
2	12 27765	Radoiu	Vlad	0766435557	03-NOV-21	5938
3	13 27765	Ionescu	George	0766456445	07-OCT-19	7344
4	14 27732	Florea	Cosmin	0745436673	10-FEB-20	6406
5	15 27732	Dumitru	Denis	0749876656	12-APR-20	6094
6	16 33444	Urzala	Andrei	0756655675	06-JUL-18	8438
7	17 33445	Teodorescu	Tudor	0723303042	08-SEP-18	3594
8	18 33267	Costache	Gigel	0704375723	10-NOV-17	5313
9	19 33234	Ene	Sergiu	0723438446	04-MAY-17	7344
10	20 33652	Popa	Alexandru	0798666743	10-OCT-16	9375
11	21 45325	Tudose	Petru	0736664324	06-AUG-16	5469
12	22 45325	Moraru	Vasile	0746885480	04-JUL-16	6250
13	23 33765	Dragan	Mihai	0754566643	06-JUN-15	7188
14	24 45565	Rusu	Gigel	0796564335	06-MAR-15	5781
15	25 45325	Matei	Alexandru	0766788312	23-APR-14	6094
16	26 45367	Stanciu	Marian	0712434112	25-JUL-14	6406
17	27 45325	Dedu	Andrei	0789555732	13-NOV-12	4063
18	28 48898	Lengher	Ionut	0708964899	27-OCT-13	4300

Figura 15 – Cerința 13

ProjectDB.sql

SQL WorksheetHistory



ProjectDB

Worksheet

Query Builder

```
WHEN NO_DATA_FOUND
THEN RAISE_APPLICATION_ERROR(-20009, 'Nu exista persoane cu numele dat ca input');
END cerinta9;

END cerintal3;
/

EXECUTE cerintal3.cerinta6;




EXECUTE cerintal3.cerinta7;
SELECT * FROM CONDUCTORI;

ROLLBACK;


SELECT cerintal3.cerinta8('Tomescu') FROM DUAL;
```

Script Output x

Query Result x



SQL | All Rows Fetched: 1 in 0.188 seconds



CERINTA13.CERINTA8('TOMESCU')

1	165
---	-----

Figura 16 – Cerința 13

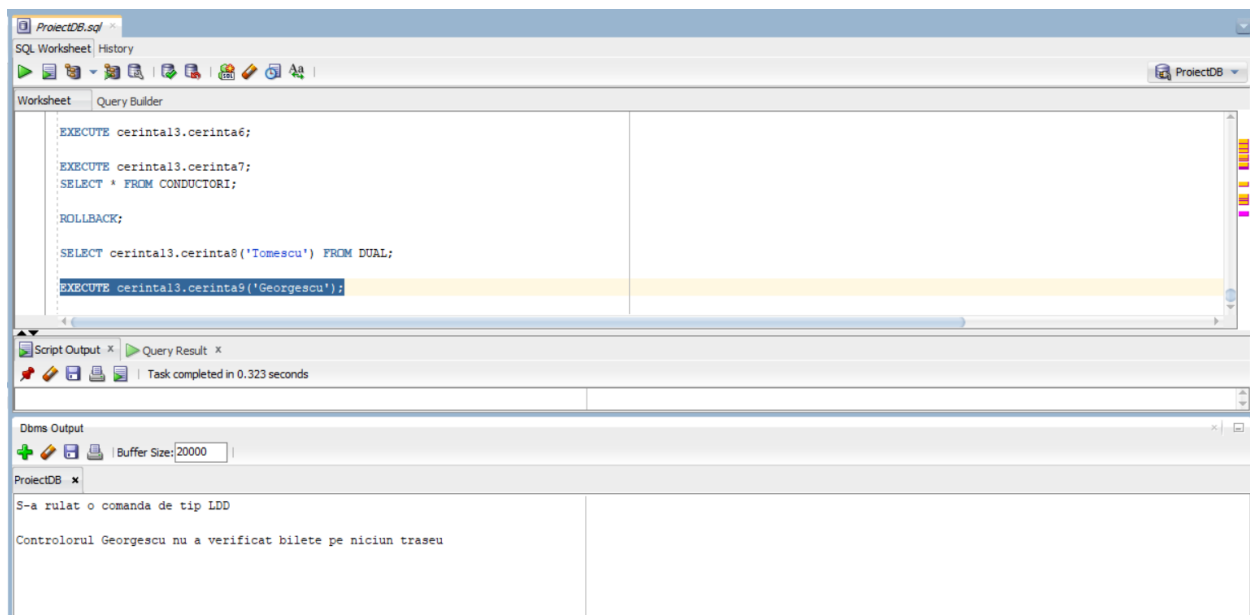


Figura 17 – Cerința 13

14. Pachet cu flux de acțiuni integrate

-- Cerinta 14 cu pachet cu obiecte necesare unui flux de actiuni.
-- Creati un tabel imbricat cu o coloana de tip record ce contine date despre angajati.
-- Se folosesc 2 proceduri pentru a stoca datele despre controlori si conductori si 2 functii,
-- una pentru a calcula media salariilor angajatilor si alta pentru a calcula numarul de angajati care au salariul peste medie.

```
SELECT * FROM CONDUCTORI;
```

```
CREATE OR REPLACE PACKAGE cerinta14 AS
    TYPE record_employees IS RECORD
        (last_name CONDUCTORI.NUME%TYPE, first_name CONDUCTORI.PRENUME%TYPE,
        id_station CONDUCTORI.COD_GARA%TYPE, salary CONDUCTORI.SALARIU%TYPE, job_name
        VARCHAR2(30));
```

```
    TYPE employees_table IS TABLE OF record_employees;
```

```
    t employees_table := employees_table();
```

```
    PROCEDURE parser_conductori;
```

```
    PROCEDURE parser_controlori;
```

```
    FUNCTION get_avarage RETURN NUMBER;
```

```
    FUNCTION get_counter RETURN NUMBER;
```

```
END cerinta14;
```

```
/
```

```
CREATE OR REPLACE PACKAGE BODY cerinta14 AS
```

```
    -- preia conductorii
```

```
    PROCEDURE parser_conductori IS
```

```
        r record_employees;
```

```
        CURSOR c IS
```

```
        SELECT ID_CONDUCTOR FROM CONDUCTORI;
```

```
    BEGIN
```

```
        FOR emp IN c LOOP
```

```
            SELECT NUME, PRENUME, COD_GARA, SALARIU, 'Conductor'
```

```

        INTO r.last_name, r.first_name, r.id_station, r.salary, r.job_name
        FROM CONDUCTORI WHERE ID_CONDUCTOR = emp.ID_CONDUCTOR;

        t.EXTEND;

        t(t.LAST) := r;

    END LOOP;
END parser_conductori;

-- preia controlorii
PROCEDURE parser_controlori IS
    r record_employees;
    CURSOR c IS
        SELECT ID_CONTROLOR FROM CONTROLORI;
BEGIN
    FOR emp IN c LOOP
        SELECT NUME, PRENUME, COD_GARA, SALARIU, 'Controlor'
        INTO r.last_name, r.first_name, r.id_station, r.salary, r.job_name
        FROM CONTROLORI WHERE ID_CONTROLOR = emp.ID_CONTROLOR;

        t.EXTEND;

        t(t.LAST) := r;

    END LOOP;
END parser_controlori;

-- calculeaza media salariilor
FUNCTION get_avarage RETURN NUMBER IS
    salary NUMBER := 0;
BEGIN
    FOR s1 IN t.FIRST .. t.LAST LOOP
        salary := salary + t(s1).SALARY;
    END LOOP;

    salary := ROUND(salary/t.COUNT);

    RETURN salary;
END get_avarage;

-- numarul de angajati care au salariul peste medie

```

```

FUNCTION get_counter RETURN NUMBER IS
    counter NUMBER := 0;
BEGIN
    FOR emp IN t.FIRST .. t.LAST LOOP
        IF (t(emp).salary > get_avarage)
            THEN counter := counter +1;
        END IF;
    END LOOP;
    RETURN counter;
END get_counter;

END cerinta14;
/

EXECUTE cerinta14.parser_conductorii;

EXECUTE cerinta14.parser_controlorii;

SELECT cerinta14.get_counter FROM DUAL;

DROP PACKAGE cerinta14;

```



Figura 18 – Cerința 14