

# **Курсова работа №1**

## **по Проектиране и администриране на бази данни**

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**Класно отделение: 12282**

**Факултетен номер: 111-7419**

### **Задание:**

Да се проектира и реализира БД за склад за ел. уреди, която да поддържа данни за:

- ✓ Категории стоки – код на категория, описание.
- ✓ Уреди – код на уред от категория, описание, ед. цена.
- ✓ Клиенти – номер, име, фамилия на клиент, ЕГН.
- ✓ Поръчки – номер на поръчка за клиент, дата.
- ✓ Детайли на поръчката – включва няколко уреда за поръчка, брой.

Да се изведе справка за номер на клиент, име, фамилия на клиент, ЕГН, номер на поръчка за клиента, дата на поръчката, код на уред, описание, ед. цена; брой, сумата за уредите, код на категория, описание. Подредба по номер на клиент.

## 1. Конекция като sysdba и създаване на нов потребител - petar

New / Select Database Connection

Connection Name	Connection Details
hr	hr@//localhost:1...
sysdba	sys@//localhost:...

Name: sysdba

Database Type: Oracle

User Info: Proxy User

Authentication Type: Default

Username: sys

Password: ...

Role: SYSDBA

Save Password: ☐

Connection Type: Basic

Details: Advanced

Hostname: localhost

Port: 1521

☒ SID: xe

☐ Service name:

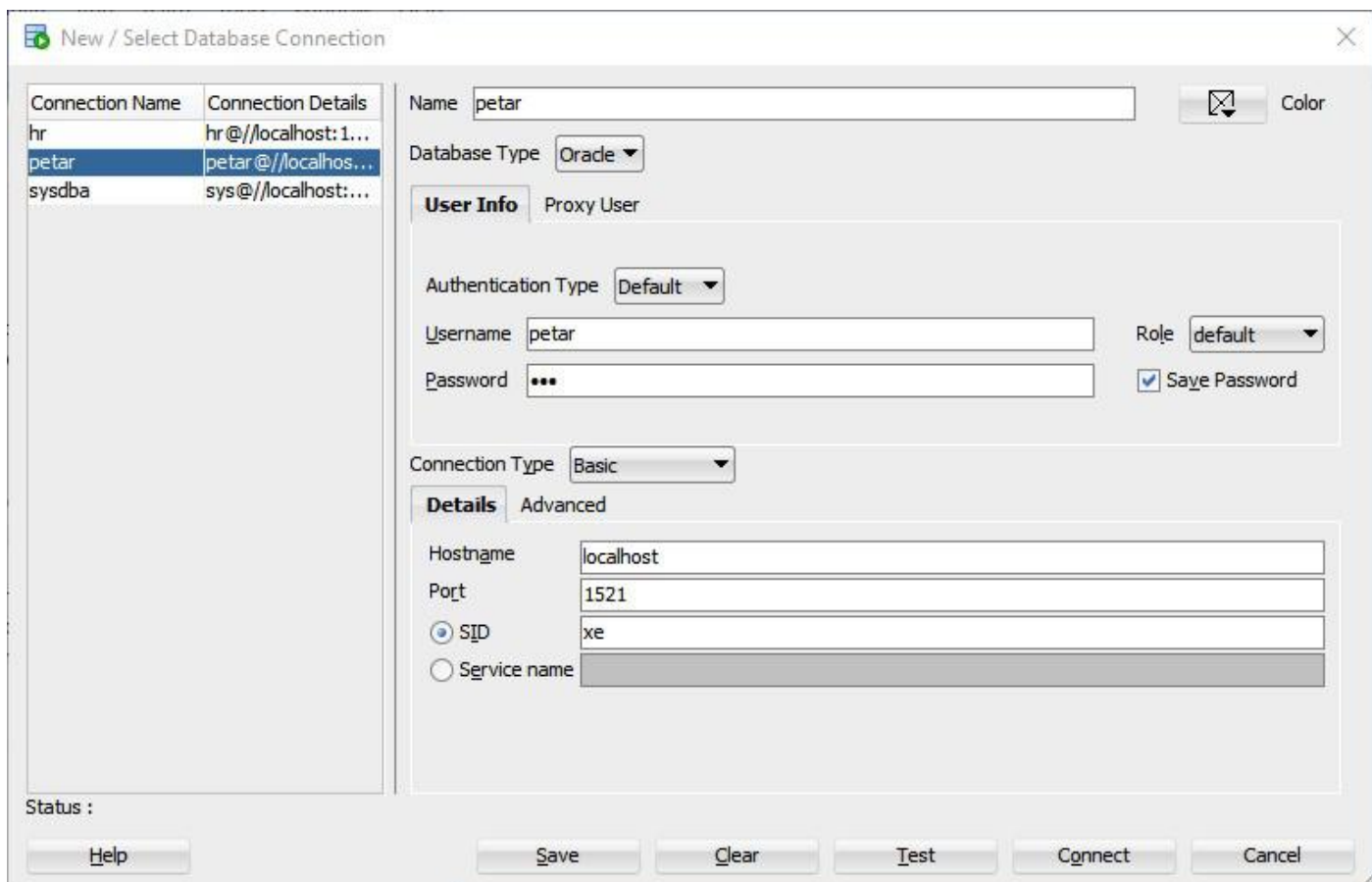
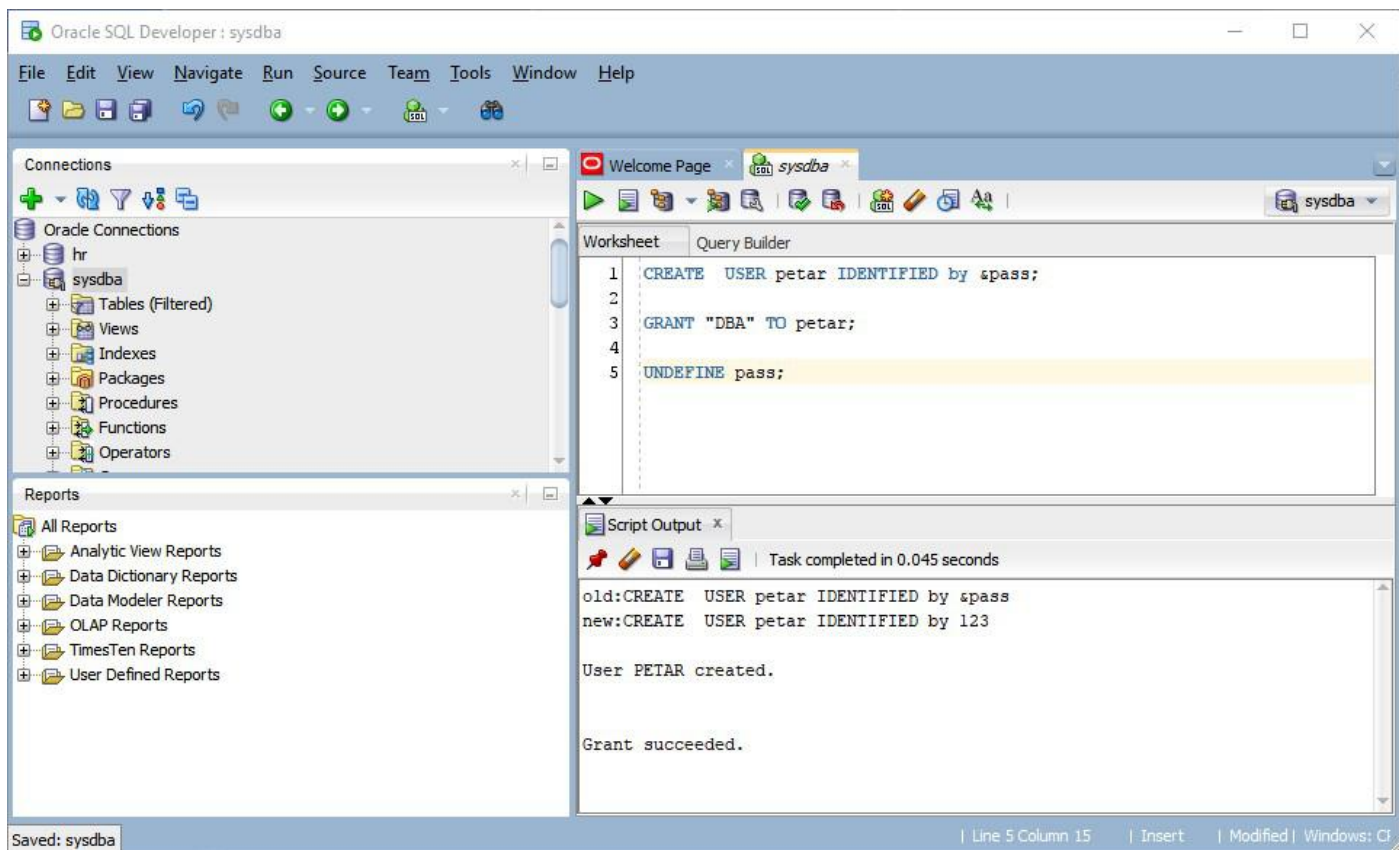
Status : Success

Buttons: Help, Save, Clear, Test, Connect, Cancel

```
CREATE USER petar IDENTIFIED by &pass;
```

```
GRANT "DBA" TO petar;
```

```
UNDEFINE pass;
```



## 2. Създаване на таблиците

```
CREATE TABLE PROD_CATEGORIES
(
  CAT_ID NUMBER,
  CAT_DESCR VARCHAR2(30) NOT NULL,

  CONSTRAINT PK_PRODCAT_CID PRIMARY KEY (CAT_ID)
);
```

```
CREATE TABLE PRODUCTS
(
  PROD_ID NUMBER,
  CAT_ID NUMBER NOT NULL,
  PROD_DESCR VARCHAR(30) NOT NULL,
  PROD_PRICE NUMBER(8,2) NOT NULL,

  CONSTRAINT PK_PRODS_PID
    PRIMARY KEY (PROD_ID),
  CONSTRAINT FK_PRODS_CID_PRODCAT_CID
    FOREIGN KEY (CAT_ID)
      REFERENCES PROD_CATEGORIES(CAT_ID)
);
```

```
CREATE TABLE CLIENTS
(
  CLIENT_ID NUMBER,
  CLIENT_FIRST_NAME VARCHAR2(20) NOT NULL,
  CLIENT_LAST_NAME VARCHAR2(20) NOT NULL,
  CLIENT_UCN CHAR(10),

  CONSTRAINT PK_CLNTS_CLID
    PRIMARY KEY (CLIENT_ID)
);
```

```
CREATE TABLE ORDERS
(
  ORDER_ID NUMBER,
  CLIENT_ID NUMBER NOT NULL,
  ORDER_DATE DATE NOT NULL,

  CONSTRAINT PK_ORDRS_OID
    PRIMARY KEY (ORDER_ID),
  CONSTRAINT FK_ORDRS_OID_CLNTS_CLID
    FOREIGN KEY (CLIENT_ID)
      REFERENCES CLIENTS(CLIENT_ID)
);
```

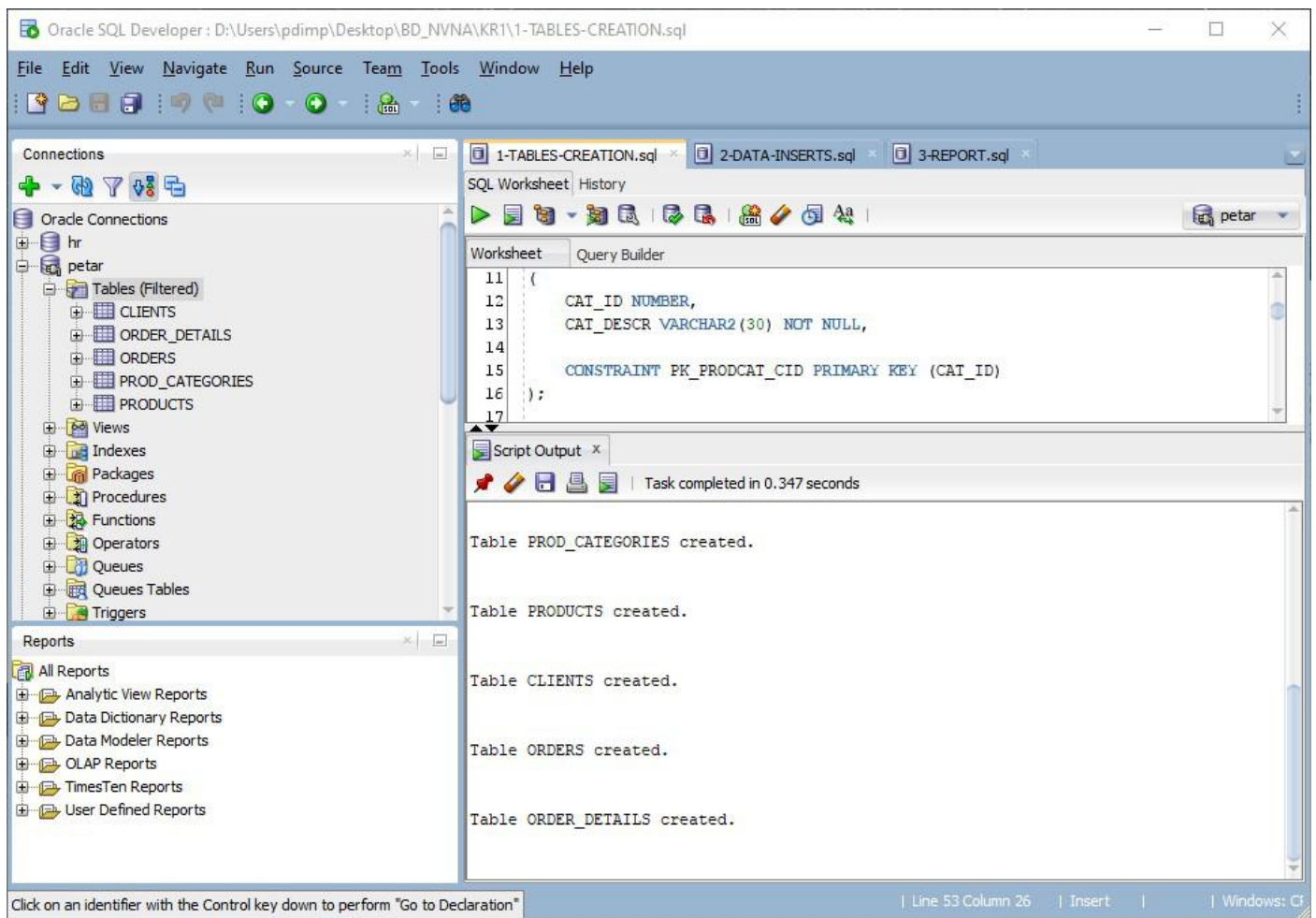
```
CREATE TABLE ORDER_DETAILS
(
  ORDER_ID NUMBER NOT NULL,
  PROD_ID NUMBER NOT NULL,
  PROD_COUNT NUMBER NOT NULL,

  CONSTRAINT FK_ORDRDET_OID_ORDRS_OID
    FOREIGN KEY (ORDER_ID)
      REFERENCES ORDERS(ORDER_ID),
```

```

CONSTRAINT FK_ORDRDET_PID_PRODS_PID
FOREIGN KEY (PROD_ID)
REFERENCES PRODUCTS(PROD_ID)
);

```



### 3. Вмъкване на данни в таблиците

```

INSERT ALL
  INTO PROD_CATEGORIES (cat_id, cat_descr) VALUES (100, 'Phones')
  INTO PROD_CATEGORIES (cat_id, cat_descr) VALUES (200, 'Notebooks')
  INTO PROD_CATEGORIES (cat_id, cat_descr) VALUES (300, 'Tablets')
  INTO PROD_CATEGORIES (cat_id, cat_descr) VALUES (400, 'Drones')
  INTO PROD_CATEGORIES (cat_id, cat_descr) VALUES (500, 'Kitchen supplies')
  INTO PROD_CATEGORIES (cat_id, cat_descr) VALUES (600, 'Garden supplies')
SELECT * FROM dual;

INSERT ALL
  INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (106, 100, 'Kids phone 4S', 19.99)
  INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (107, 100, 'Gaming phone 12XS+', 2499.99)
  INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (108, 100, 'Work phone 10', 149.99)
  INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (109, 100, 'Home phone 3G', 9.99)
  INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (110, 100, 'Brick 1', 9.99)

  INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (211, 200, 'Mega Note', 1499.99)
  INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (212, 200, 'Noted One', 1999.99)
  INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (213, 200, 'Brick Mega Gaming 3', 9999.99)

```

```

    INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (214, 200, 'Gaming Pro 10',
4999.99)
    INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (215, 200, 'WorkBook 12',
1479.99)

    INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (301, 300, 'Kiddy Tab 2', 49.99)
    INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (302, 300, 'Worker Pro', 149.99)
    INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (303, 300, 'Gamers Wish', 349.99)
    INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (304, 300, 'WorkingTab 3',
299.99)
    INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (305, 300, 'HomeTabby', 199.99)

    INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (436, 400, 'Military Drone 10',
1999.99)
    INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (437, 400, 'Medical Drone Pro
Health', 2999.99)
    INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (438, 400, 'Spying Drone 2',
199.99)

    INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (501, 500, 'Blender', 49.99)
    INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (502, 500, 'Toaster', 21.99)
    INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (503, 500, 'Microwave', 149.99)
    INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (504, 500, 'Juicer', 69.99)
    INTO PRODUCTS (PROD_ID, CAT_ID, PROD_DESCR, PROD_PRICE) VALUES (505, 500, 'Coffe grinder', 36.99)
SELECT * FROM dual;

INSERT ALL
    INTO CLIENTS (CLIENT_ID, CLIENT_FIRST_NAME, CLIENT_LAST_NAME, CLIENT_UCN) VALUES (1001,
'Ivan', 'Ivanov', '1524023512')
    INTO CLIENTS (CLIENT_ID, CLIENT_FIRST_NAME, CLIENT_LAST_NAME, CLIENT_UCN) VALUES (1002,
'Ivanka', 'Ivanova', '1525623512')
    INTO CLIENTS (CLIENT_ID, CLIENT_FIRST_NAME, CLIENT_LAST_NAME, CLIENT_UCN) VALUES (1003,
'Vanio', 'Ivanovich', '1524468512')
    INTO CLIENTS (CLIENT_ID, CLIENT_FIRST_NAME, CLIENT_LAST_NAME, CLIENT_UCN) VALUES (1004,
'Venci', 'Venciev', '7584652310')
    INTO CLIENTS (CLIENT_ID, CLIENT_FIRST_NAME, CLIENT_LAST_NAME, CLIENT_UCN) VALUES (1005,
'Pesho', 'Peshov', '7526213252')
    INTO CLIENTS (CLIENT_ID, CLIENT_FIRST_NAME, CLIENT_LAST_NAME, CLIENT_UCN) VALUES (1006,
'Gosho', 'Goshev', '7563125262')
SELECT * FROM dual;

INSERT ALL
    INTO ORDERS (ORDER_ID, CLIENT_ID, ORDER_DATE) VALUES (5168, 1001, '31-may-98')
    INTO ORDERS (ORDER_ID, CLIENT_ID, ORDER_DATE) VALUES (5615, 1001, '2-may-98')
    INTO ORDERS (ORDER_ID, CLIENT_ID, ORDER_DATE) VALUES (8456, 1003, '1-may-99')
    INTO ORDERS (ORDER_ID, CLIENT_ID, ORDER_DATE) VALUES (8452, 1005, '4-may-00')
    INTO ORDERS (ORDER_ID, CLIENT_ID, ORDER_DATE) VALUES (7897, 1003, '21-may-11')
    INTO ORDERS (ORDER_ID, CLIENT_ID, ORDER_DATE) VALUES (1567, 1004, '11-may-20')
    INTO ORDERS (ORDER_ID, CLIENT_ID, ORDER_DATE) VALUES (1256, 1002, '23-may-85')
    INTO ORDERS (ORDER_ID, CLIENT_ID, ORDER_DATE) VALUES (5631, 1002, '16-may-98')
    INTO ORDERS (ORDER_ID, CLIENT_ID, ORDER_DATE) VALUES (9542, 1006, '17-may-98')
SELECT * FROM dual;

INSERT ALL
    INTO ORDER_DETAILS (ORDER_ID, PROD_ID, PROD_COUNT) VALUES (5168, 437, 10)
    INTO ORDER_DETAILS (ORDER_ID, PROD_ID, PROD_COUNT) VALUES (5168, 436, 2)
    INTO ORDER_DETAILS (ORDER_ID, PROD_ID, PROD_COUNT) VALUES (5615, 215, 14)
    INTO ORDER_DETAILS (ORDER_ID, PROD_ID, PROD_COUNT) VALUES (8456, 501, 1)
    INTO ORDER_DETAILS (ORDER_ID, PROD_ID, PROD_COUNT) VALUES (8452, 107, 3)
    INTO ORDER_DETAILS (ORDER_ID, PROD_ID, PROD_COUNT) VALUES (7897, 436, 110)
    INTO ORDER_DETAILS (ORDER_ID, PROD_ID, PROD_COUNT) VALUES (1567, 502, 2)

```

```

    INTO ORDER_DETAILS (ORDER_ID, PROD_ID, PROD_COUNT) VALUES (1256, 305, 2)
    INTO ORDER_DETAILS (ORDER_ID, PROD_ID, PROD_COUNT) VALUES (5631, 213, 8)
    INTO ORDER_DETAILS (ORDER_ID, PROD_ID, PROD_COUNT) VALUES (9542, 503, 9)
SELECT * FROM dual;

COMMIT;

```

#### 4. Describe на таблиците и Select на всички вмъкнати данни

##### i. PROD\_CATEGORIES

- *DESCRIBE PROD\_CATEGORIES;*

```

Name      Null?   Type
-----
CAT_ID    NOT NULL NUMBER
CAT_DESCR NOT NULL VARCHAR2(30)

```

- *SELECT \* FROM PROD\_CATEGORIES;*

	CAT_ID	CAT_DESCR
1	100	Phones
2	200	Notebooks
3	300	Tablets
4	400	Drones
5	500	Kitchen supplies
6	600	Garden supplies

##### ii. PRODUCTS

- *DESCRIBE PRODUCTS;*

```

Name      Null?   Type
-----
PROD_ID   NOT NULL NUMBER
CAT_ID    NOT NULL NUMBER
PROD_DESCR NOT NULL VARCHAR2(30)
PROD_PRICE NOT NULL NUMBER(8,2)

```

- *SELECT \* FROM PRODUCTS;*

	PROD_ID	CAT_ID	PROD_DESCR	PROD_PRICE
1	106	100	Kids phone 4S	19.99
2	107	100	Gaming phone 12XS+	2499.99
3	108	100	Work phone 10	149.99
4	109	100	Home phone 3G	9.99
5	110	100	Brick 1	9.99
6	211	200	Mega Note	1499.99
7	212	200	Noted One	1999.99
8	213	200	Brick Mega Gaming 3	9999.99
9	214	200	Gaming Pro 10	4999.99
10	215	200	WorkBook 12	1479.99
11	301	300	Kiddy Tab 2	49.99
12	302	300	Worker Pro	149.99
13	303	300	Gamers Wish	349.99
14	304	300	WorkingTab 3	299.99
15	305	300	HomeTabby	199.99
16	436	400	Military Drone 10	1999.99
17	437	400	Medical Drone Pro Health	2999.99
18	438	400	Spying Drone 2	199.99
19	501	500	Blender	49.99
20	502	500	Toaster	21.99
21	503	500	Microwave	149.99
22	504	500	Juicer	69.99
23	505	500	Coffe grinder	36.99

### iii. CLIENTS

- *DESCRIBE CLIENTS;*

```

Name      Null?  Type
-----
CLIENT_ID    NOT NULL NUMBER
CLIENT_FIRST_NAME NOT NULL VARCHAR2(20)
CLIENT_LAST_NAME NOT NULL VARCHAR2(20)
CLIENT_UCN    CHAR(10)

```

- *SELECT \* FROM CLIENTS;*

	CLIENT_ID	CLIENT_FIRST_NAME	CLIENT_LAST_NAME	CLIENT_UCN
1	1001	Ivan	Ivanov	1524023512
2	1002	Ivanka	Ivanova	1525623512
3	1003	Vanio	Ivanovich	1524468512
4	1004	Venci	Venciev	7584652310
5	1005	Pesho	Peshov	7526213252
6	1006	Gosho	Goshev	7563125262

### iv. ORDERS

- *DESCRIBE ORDERS;*



Name Null? Type

-----

ORDER\_ID NOT NULL NUMBER

CLIENT\_ID NOT NULL NUMBER

ORDER\_DATE NOT NULL DATE

- *SELECT \* FROM ORDERS;*

	ORDER_ID	CLIENT_ID	ORDER_DATE
1	5168	1001	31-MAY-98
2	5615	1001	02-MAY-98
3	8456	1003	01-MAY-99
4	8452	1005	04-MAY-00
5	7897	1003	21-MAY-11
6	1567	1004	11-MAY-20
7	1256	1002	23-MAY-85
8	5631	1002	16-MAY-98
9	9542	1006	17-MAY-98

#### v. ORDER\_DETAILS

- *DESCRIBE ORDER\_DETAILS;*

Name Null? Type

-----

ORDER\_ID NOT NULL NUMBER

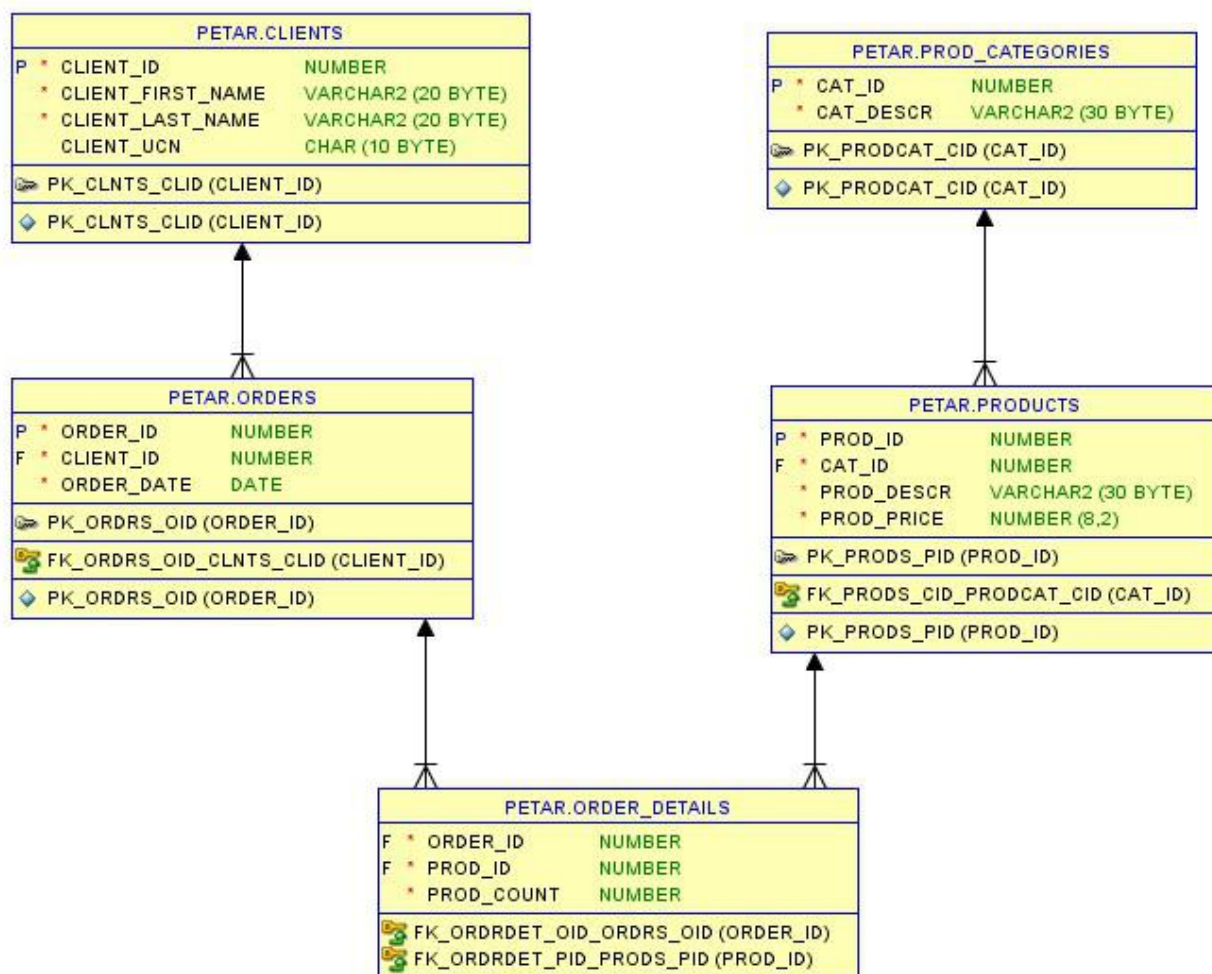
PROD\_ID NOT NULL NUMBER

PROD\_COUNT NOT NULL NUMBER

- *SELECT \* FROM ORDER\_DETAILS;*

	ORDER_ID	PROD_ID	PROD_COUNT
1	5168	437	10
2	5168	436	2
3	5615	215	14
4	8456	501	1
5	8452	107	3
6	7897	436	110
7	1567	502	2
8	1256	305	2
9	5631	213	8
10	9542	503	9

## 5. Графично и писмено представяне на таблиците и техните връзки



### Таблица *CLIENTS* и *ORDERS*:

- една самостоятелна връзка, независима, един към много осъществена чрез primary key **PK\_CLNTS\_CLID** по колона **CLIENT\_ID** от *CLIENTS* и foreign key **FK\_ORDRS\_OID\_CLNTS\_CLID** по колона **CLIENT\_ID** от *ORDERS*. Един клиент осъществява много поръчки (1:n)

### Таблица *PROD\_CATEGORIES* и *PRODUCTS*:

- една самостоятелна връзка, независима, един към много осъществена чрез primary key **PK\_PRODCAT\_CID** по колона **CAT\_ID** от *PROD\_CATEGORIES* и foreign key **FK\_PRODS\_CID\_PRODCAT\_CID** по колона **CAT\_ID** от *PRODUCTS*. От една категория има много продукти (1:n)

### Таблица *ORDERS* и *PRODUCTS*

- една връзка много към много - реализира се чрез 2 връзки 1 към много с помощта на трета таблица (*ORDER\_DETAILS*) осъществено по следния начин: чрез primary key **PK\_ORDRS\_OID** - колона **ORDER\_ID** от таблица *ORDERS*, primary key **PK\_PRODS\_PID** - колона **CAT\_ID** от таблица *PRODUCTS* и съответно foreign key **FK\_ORDRDET\_OID\_ORDRS\_OID** - колона **ORDER\_ID** от

таблица ORDER\_DETAILS, foreign key FK\_ORDDDET\_PID\_PRODS\_PID - колона PROD\_ID от таблица ORDER\_DETAILS. Много продукти се включват в много поръчки (n:m)

## 6. Извеждане на справка от всички таблици

```
SELECT
  C.CLIENT_ID,
  C.CLIENT_FIRST_NAME,
  C.CLIENT_LAST_NAME,
  C.CLIENT_UCN,
  O.ORDER_ID,
  O.ORDER_DATE,
  O_DET.PROD_ID,
  P.PROD_DESCR,
  O_DET.PROD_COUNT,
  P.PROD_PRICE,
  O_DET.PROD_COUNT * P.PROD_PRICE AS FINAL_PRICE,
  P.CAT_ID,
  P_CAT.CAT_DESCR
FROM CLIENTS C
JOIN ORDERS O
  ON C.CLIENT_ID = O.CLIENT_ID
JOIN ORDER_DETAILS O_DET
  ON O.ORDER_ID = O_DET.ORDER_ID
JOIN PRODUCTS P
  ON O_DET.PROD_ID = P.PROD_ID
JOIN PROD_CATEGORIES P_CAT
  ON P.CAT_ID = P_CAT.CAT_ID
ORDER BY
  C.CLIENT_ID,
  O.ORDER_DATE;
```

	CLIENT_ID	CLIENT_FIRST_NAME	CLIENT_LAST_NAME	CLIENT_UCN	ORDER_ID	ORDER_DATE	PROD_ID	PROD_DESCR	PROD_COUNT	PROD_PRICE	FINAL_PRICE	CAT_ID	CAT_DESCR
1	1001	Ivan	Ivanov	1524023512	5615	02-MAY-98	215	WorkBook 12	14	1479.99	20719.86	200	Notebooks
2	1001	Ivan	Ivanov	1524023512	5168	31-MAY-98	437	Medical Drone Pro Health	10	2999.99	29999.9	400	Drones
3	1001	Ivan	Ivanov	1524023512	5168	31-MAY-98	436	Military Drone 10	2	1999.99	3999.98	400	Drones
4	1002	Ivanka	Ivanova	1525623512	1256	23-MAY-85	305	HomeTabby	2	199.99	399.98	300	Tablets
5	1002	Ivanka	Ivanova	1525623512	5631	16-MAY-98	213	Brick Mega Gaming 3	8	9999.99	79999.92	200	Notebooks
6	1003	Vanio	Ivanovich	1524468512	8456	01-MAY-99	501	Blender	1	49.99	49.99	500	Kitchen supplies
7	1003	Vanio	Ivanovich	1524468512	7897	21-MAY-11	436	Military Drone 10	110	1999.99	219998.9	400	Drones
8	1004	Venci	Venciev	7584652310	1567	11-MAY-20	502	Toaster	2	21.99	43.98	500	Kitchen supplies
9	1005	Pesho	Peshov	7526213252	8452	04-MAY-00	107	Gaming phone 12XS+	3	2499.99	7499.97	100	Phones
10	1006	Gosho	Goshev	7563125262	9542	17-MAY-98	503	Microwave	9	149.99	1349.91	500	Kitchen supplies