

Datenbanken 2

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Übung 2

Aufgabe 2.

1.Möglichkeit

```
create or replace TYPE KONTOT AS OBJECT
(
  Nummer integer,
  Stand float,
  Art varchar2(1)
);
```

```
create or replace TYPE KUNDET AS OBJECT
(
  Nummer int,
  Name varchar2(20),
  Adresse varchar2(50),
  Status varchar2(20),
  kontos Kontolistet
);
```

```
create or replace TYPE KONTOLISTET
AS TABLE OF ref KONTOT;
```

```
create or replace TYPE ZWEIGSTELLET AS OBJECT
(
  name varchar2(20),
  adresse varchar2(50),
  leiter varchar2(20),
  kontos kontolistet
);
```

2.Möglichkeit

```
create or replace TYPE KUNDET2 AS OBJECT
(
    Nummer int,
    Name varchar2(20),
    Adresse varchar2(50),
    Status varchar2(20),
    kontoNr kontoNrList
);
```

```
create or replace TYPE KONTOLISTET2
AS TABLE OF KONTOT;
```

```
create or replace TYPE kontoNrList AS Table of int;
```

```
create or replace TYPE zweigstellet2 AS OBJECT (
    name      VARCHAR2(20),
    adresse    VARCHAR2(50),
    leiter     VARCHAR2(20),
    kontos     kontolistet2
);
```

Aufgabe 3.

```
Create Table Kunde of KUNDET
    NESTED TABLE kontos
    STORE AS KONTOS_NT;
```

```
Create Table Zweigstelle of Zweigstellet
    NESTED TABLE kontos
    STORE AS KONTOS_ZW_NT;
```

```
Create Table Konto of Kontot;
```

```
Create Table ZWEIGSTELLE2 of ZWEIGSTELLET2
```

```
NESTED Table kontos
STORE as kontos_zweigstelle2_nt;
```

```
Create Table KUNDE2 of KUNDET2
NESTED Table kontoNr
STORE as kontoNr_nt;
```

Kontos anlegen

```
INSERT INTO KONTO VALUES(987654, 789.65, 'G');
INSERT INTO KONTO VALUES(745363, -23.67, 'S');
```

Kunden anlegen

```
INSERT INTO KUNDE VALUES (8765, 'J.Wiesner',
    'Schellingstr.42', 'Geschäftskunde',
    KONTOLISTET(
        (SELECT REF(k)FROM KONTO k WHERE k.nummer = 745363),
        (SELECT REF(k)FROM KONTO k WHERE k.nummer = 678453),
        (SELECT REF(k)FROM KONTO k WHERE k.nummer = 348973)));

INSERT INTO KUNDE VALUES (7654, 'B.Meier',
    'Eschenweg 12',
    'Privatkunde',
    KONTOLISTET(
        (SELECT REF(k)FROM KONTO k WHERE k.nummer = 987654)));

Insert into KUNDE2 Values (
    2345, 'H. Fach', 'Münchenerstrasse 33',
    'Geschäftskunde',
    KONTONRLIST(120768,348973));

Insert into KUNDE2 Values (
    7654, 'B. Meier', 'Eschenweg 12',
    'Privatkunde',
    KONTONRLIST(987654));

Insert into KUNDE2 Values (
    8764, 'J. Wiesner', 'Schellingstrasse 42',
    'Geschäftskunde', KONTONRLIST(745363,678453,348973));
```

Zweigstellen anlegen

```

INSERT INTO ZWEIGSTELLE VALUES ('Bachdorf', 'Hochstr.1', 1768,
KONTOLISTET(
(SELECT REF(k)FROM KONTO k WHERE k.nummer = 120768),
(SELECT REF(k)FROM KONTO k WHERE k.nummer = 678453),
(SELECT REF(k)FROM KONTO k WHERE k.nummer = 987654)));

INSERT INTO ZWEIGSTELLE VALUES ('Riedering', 'Simseestr.3', 9823,
KONTOLISTET(
(SELECT REF(k)FROM KONTO k WHERE k.nummer = 987654),
(SELECT REF(k)FROM KONTO k WHERE k.nummer = 745363)));

Insert into ZWEIGSTELLE2 Values (
'Bachdorf','Hochstrasse 1','1768',
KONTOLISTET2(KONTOT(120768,234.56,'S'),
KONTOT(678453,-456.78,'G'),
KONTOT(348973,12567.56,'G')));

Insert into ZWEIGSTELLE2 Values (
'Riedering','Simseestrasse 3','9823',
KONTOLISTET2(KONTOT(987654,789.65,'G'),
KONTOT(745363,-23.67,'S')));

```

Aufgabe 4.

Select statement a)

```

SELECT
DEREF(k.COLUMN_VALUE).Nummer AS Kontonummer,
DEREF(k.COLUMN_VALUE).Stand AS Kontostand,
DEREF(k.COLUMN_VALUE).Art AS Kontoart , zw.ADRESSE
FROM ZWEIGSTELLE zw, TABLE(zw.Kontos) k;

```

```

SELECT
    deref(k.column_value).nummer AS kontonummer,
    deref(k.column_value).stand AS kontostand,
    deref(k.column_value).art AS kontoart,
    zw.adresse
FROM
    zweigstelle zw,
    TABLE ( zw.kontos ) k;

```

Skriptausgabe x Abfrageergebnis x Abfrageergebnis 1 x				
SQL Alle Zeilen abgerufen:5 in 0,091 Sekunden				
	KONTONUMMER	KONTOSTAND	KONTOART	ADRESSE
1	987654	789,65 G		Simseestr.3
2	745363	-23,67 S		Simseestr.3
3	120768	234,56 S		Hochstr.1
4	678453	-456,78 G		Hochstr.1
5	987654	789,65 G		Hochstr.1

```

SELECT z.adresse, k.nummer, k.stand, k.art
FROM ZWEIGSTELLE2 z, TABLE(z.kontos) k;

```

Arbeitsblatt Query Builder	
SELECT z.adresse, k.nummer, k.stand, k.art FROM ZWEIGSTELLE2 z, TABLE(z.kontos) k;	
Abfrageergebnis x	
SQL Alle Zeilen abgerufen:5 in 0,106 Sekunden	
ADRESSE	NUMMER STAND ART
1 Hochstrasse 1	120768 234,56 S
2 Hochstrasse 1	678453 -456,78 G
3 Hochstrasse 1	348973 12567,56 G
4 Simseestrasse 3	987654 789,65 G
5 Simseestrasse 3	745363 -23,67 S

Select statement b)

```

SELECT Deref(kundenKonto.COLUMN_VALUE).Nummer, Kunde.ADRESSE
FROM Kunde, TABLE(Kunde.Kontos) kundenKonto;

```

<pre>SELECT Deref(kundenKonto.COLUMN_VALUE).Nummer, Kunde.ADRESSE FROM Kunde, TABLE(Kunde.Kontos) kundenKonto;</pre>		
Skriptausgabe x Abfrageergebnis x Abfrageergebnis 1 x		
SQL Alle Zeilen abgerufen:6 in 0,075 Sekunden		
	DEREF(KUNDENKONTO.COLUMN_VALUE).NUMMER	ADRESSE
1	120768	Münchnerstr.33
2	348973	Münchnerstr.33
3	745363	Schellingstr.42
4	678453	Schellingstr.42
5	348973	Schellingstr.42
6	987654	Eschenweg 12

```
SELECT k.adresse, (n.COLUMN_VALUE) FROM KUNDE2 k, TABLE(k.kontoNr) n;
```

Arbeitsblatt	Query Builder
<pre>SELECT k.adresse, (n.COLUMN_VALUE) FROM KUNDE2 k, TABLE(k.kontoNr) n;</pre>	
Abfrageergebnis x	
SQL Alle Zeilen abgerufen:6 in 0,183 Sekunden	
ADRESSE	COLUMN_VALUE
1 Münchenerstrasse 33	120768
2 Münchenerstrasse 33	348973
3 Eschenweg 12	987654
4 Schellingstrasse 42	745363
5 Schellingstrasse 42	678453
6 Schellingstrasse 42	348973

Aufgabe 5.

Typen:

```
create or replace TYPE Casual_T UNDER EMPLOYEE_T
(
  hourly_wage int
);
```

```
create or replace type comp_type_t as Object (  
    type_desc varchar2(50)  
)not final;
```

```
create or replace type comp_type_1_T under comp_type_T (  
    area varchar2(20)  
);
```

```
create or replace type comp_type_2_T under comp_type_T (  
    market varchar2(20)  
);
```

```
create or replace type phone_list_T as Table of varchar2(20);
```

```
create or replace type Company_T as Object (  
    comp_ID int,  
    comp_name varchar2(40),  
    comp_address varchar2(100),  
    comp_phone_list phone_list_T,  
    comp_fax varchar2(20),  
    comp_type comp_type_t  
);
```

```
create or replace TYPE CUSTOMER_T AS OBJECT  
(  
    cust_ID varchar2(255),  
    cust_name varchar2(255),  
    cust_address varchar2(255),  
    cust_phone varchar2(255),  
    cust_gender varchar2(255),  
    cust_DOB date  
)
```

```
create or replace TYPE DEPARTMENT_T AS OBJECT  
(  
    store_ID varchar2(255),  
    dept_ID varchar2(255),  
    dept_name varchar2(255),
```

```
dept_head varchar2(255)
);
```

```
create type available_in_t as Object (
    item_ID varchar2(20),
    store_ID varchar2(20),
    item_stock float
);
```

```
create or replace TYPE EMPLOYEE_T AS OBJECT
(
    emp_ID varchar2(255),
    emp_name varchar2(255),
    emp_address varchar2(255),
    emp_phone varchar2(255),
    emp_type varchar2(255),
    emp_account_no varchar2(255),
    emp_TFN varchar2(255),
    dept_ID varchar2(255),
    Work_In varchar2(255)
)NOT FINAL
```

```
create or replace TYPE FULL_TIME_T UNDER EMPLOYEE_T
(
    annual_wage int,
    emp_bonus int
)
```

```
create or replace TYPE ITEM_T AS OBJECT
(
    item_ID varchar2(255),
    item_name varchar2(255),
    item_desc varchar2 (255),
    item_cost float,
    item_price float,
    Made_by ref MAKER_T
);
```

```
create or replace type Maker_T as Object (
    maker_ID varchar2(10),
    maker_name varchar2(50),
    maker_address varchar2(100),
```



```
maker_phone varchar2(20)
);
```

```
create or replace type Manager_T as Object (
    manag_ID int,
    manag_type varchar2(20),
    yearly_salary float
);
```

```
create or replace type Director_T as Object (
    manag_ID int,
    dir_bonus varchar2(10)
);
```

```
create or replace type Management_T as Object (
    manag_ID int,
    manag_name varchar2(40),
    manag_address varchar2(100),
    manag_phone varchar2(20),
    comp_ID int,
    manager_ ref Manager_T,
    director_ ref Director_T
);
```

```
create or replace type own_shares_T as Object(
    shareholder_ID int,
    comp_ID int,
    share_amount int
);
```

```
create or replace TYPE Part_Time_T UNDER EMPLOYEE_T
(
    weekly_wage int
);
```

```
create or replace type Shareholder_T as Object (
    shareholder_ID int,
    shareholder_name varchar2(40),
    shareholder_address varchar2(100),
```

```
shareholder_phone varchar2(20)
);
```

```
create or replace type Store_T as Object (
    store_ID varchar2(10),
    store_location varchar2(50),
    store_address varchar2(100),
    store_phone varchar2(20),
    is_in int,
    store_manager varchar2(50)
);
```

```
create or replace TYPE TRANSACTION_T AS OBJECT
(
    trans_ID int,
    trans_date date,
    quantitiy int,
    Cust_ID ref CUSTOMER_T,
    Item_ID ref ITEM_T
);
```

Create Table Statements

```
CREATE TABLE CUSTOMER OF CUSTOMER_T;

CREATE TABLE EMPLOYEE OF EMPLOYEE_T;

CREATE TABLE ITEM OF ITEM_T;

CREATE TABLE DEPTMENT OF DEPARTMENT_T;

create table maker of Maker_T;

create table Director of Director_T;

create table Manager of Manager_T;

create table Management of Management_T;

create table own_shares of own_shares_T;

create table Company of COMPANY_T
nested table comp_phone_list
store as comp_phone_list_nt

create table Shareholder of SHAREHOLDER_T;
```

```
create table Store of STORE_T;

create table Available_in of AVAILABLE_IN_T;
```

Insert Statements

```
INSERT INTO CUSTOMER VALUES(
  'C1001',
  'Sally Lange',
  '14 Milky Way St Melbourne 3000',
  '0395486542',
  'F',
  DATE '1970-03-12',
);
```

```
INSERT INTO EMPLOYEE VALUES (FULL_TIME_T(
  '0B1-01',
  'Glenda Row',
  '10/1 Harold St. Thornbury 3125',
  '0395854523',
  'FT',
  '2568-548-586',
  '081253654',
  '1',
  '0B1',
  3000,
  2000
));
```

```
INSERT INTO EMPLOYEE VALUES (PART_TIME_T(
  '0B1-03',
  'Lily Hui',
  '6 Mornane ST Preston 3203',
  '0411528876',
  'Part Time',
  '1259-968-458',
  '089658754',
  '1',
  '0B2',
  400
));
```

```
INSERT INTO TRANSACTION VALUES(
  1602027891,
  DATE '2002-02-16',
  5,
  (SELECT ref(c) FROM CUSTOMER c WHERE c.cust_ID = 'C1001'),
```

```
(SELECT ref(i) FROM ITEM i WHERE i.item_ID = 'I-1001')
);
```

```
INSERT INTO DEPARTMENT VALUES(
    '0B1',
    '1',
    'Deli',
    'Jared Dench'
);
```

```
INSERT INTO DEPARTMENT VALUES(
    '0B1',
    '2',
    'Bakery',
    'Charlie Williams'
);
```

```
insert into OWN_SHARES Values (
100, 1, 1000
);
insert into OWN_SHARES Values (
100, 2, 250
);
insert into OWN_SHARES Values (
200, 1, 2500
);
```

```
insert into SHAREHOLDER Values (
100, 'Judith Maxwell', '40 Pinnacles Rd Melbourne 3000', '03934502093'
);
insert into SHAREHOLDER Values (
200, 'Ian Hobbes', '2 Red Oak Ave Hobart 7000', '0362231658'
);
```

```
insert into MAKER Values (
'M1', 'Smiths',
'15 Princess Hwy Sydney 2000',
'1800157856'
);
insert into MAKER Values (
'M2', 'Homemade',
'450 Light Ave Albury 2780',
'0245245263'
);
```

```
insert into DIRECTOR Values (  
1001, '5%'  
);  
insert into DIRECTOR Values (  
1002, '10%'  
);
```

```
insert into MANAGER Values (  
1001, 'Information System', 100000  
);  
insert into MANAGER Values (  
1003, 'Operational', 85000  
);
```

```
insert into MANAGEMENT Values (  
1001, 'Kumio Takahashi', '20 Avondale Cr. Darlinghurst 2010', '0296101024',  
1, (Select ref(m) From MANAGER m Where manag_ID = 1001),  
(Select ref(d) From DIRECTOR d Where manag_ID = 1001)  
);  
insert into MANAGEMENT Values (  
1002, 'Lucia Zanetti', '5 Noel St Double Bay 2028', '0290125846',  
1, (Select ref(m) From MANAGER m Where manag_ID = 1002),  
(Select ref(d) From DIRECTOR d Where manag_ID = 1002)  
);  
insert into MANAGEMENT Values (  
1003, 'Stanley Mann', '2/2 Ross St Masot 2020', '0295211110',  
1, (Select ref(m) From MANAGER m Where manag_ID = 1003),  
(Select ref(d) From DIRECTOR d Where manag_ID = 1003)  
);
```

```
insert into COMPANY Values (  
1, 'OZ Buyer', '20 Russel St Sydney 2000',  
PHONE_LIST_T('0298394000', '0298394005', '1800489000'),  
'0298398371', COMP_TYPE_1_T('Food and Daily Goods', 'NSW ACT')  
);  
insert into COMPANY Values (  
2, 'Goodies', '50 Collins St',  
PHONE_LIST_T('0394255000', '0394355005', '18009000000'),  
'0394250005', COMP_TYPE_1_T('Food Daily Goods', 'VIC SA TAS')  
);
```

```
insert into STORE Values (  

```

```

'OB1', 'Parmatta',
'4 Victoria Rd Paramatta 2797',
'0298545876', 1,
'Alice Green'
);
insert into STORE Values (
'OB2', 'Newcastle',
'15 University Dv Callaghan 2308',
'024589 5444', 1,
'Rob Hayes'
);
insert into STORE Values (
'H1', 'Wollongong', '5 Princess Hwy Woll. 2500', '024256 8751', 4,
'Elda Stiebel'
);

```

```

insert into AVAILABLE_IN Values (
'I-1001', 'OB1', 5000
);
insert into AVAILABLE_IN Values (
'I-1002', 'OB1', 5000
);
insert into AVAILABLE_IN Values (
'I-1051', 'OB1', 200
);

```