SE 3060 – Database Systems

Lab- 03

IT23215306

NIMSARA R V P P

Y3.S1.WE.SE.02

1.

```sql
create type address_t as object(
    street_number number(3),
    street_name varchar2(50),
    suburb varchar2(50),
    state varchar2(20),
    pin varchar2(10)
);
/


create type exchange_varray as varray(5) of varchar(20);
/


create type stock_t as object(
    company varchar(50),
    current_price number(10,2),
    exchanges exchange_varray,
    last_dividend number(10,2),
    eps number(10,2)
);
/


create type investment_t as object(
    company ref stock_t,
    purchase_price number(10,2),
    purchase_date date,
    qty number
);
/


create type investment_list as table of investment_t;
/
```

```
create type client_t as object(
        client_no number;
        firstname varchar2(30),
        lastname varchar2(30),
        address address_t,
        investments investment_list
);
/


create table stock of stock_t (
    company PRIMARY KEY
);




create table client of client_t(
        client_no primary key
)

NESTED table investments store AS investments_tab;

commit;




2.
INSERT INTO stock VALUES (
    stock_t('BHP', 10.50, exchange_varray('Sydney','New York'), 1.50, 3.20)
);
INSERT INTO stock VALUES (
    stock_t('IBM', 70.00, exchange_varray('New York','London','Tokyo'), 4.25,
10.00)
);
INSERT INTO stock VALUES (
```

```
    stock_t('INTEL', 76.50, exchange_varray('New York','London'), 5.00, 12.40)
);
INSERT INTO stock VALUES (
    stock_t('FORD', 40.00, exchange_varray('New York'), 2.00, 8.50)
);
INSERT INTO stock VALUES (
    stock_t('GM', 60.00, exchange_varray('New York'), 2.50, 9.20)
);
INSERT INTO stock VALUES (
    stock_t('INFOSYS', 45.00, exchange_varray('New York'), 3.00, 7.80)
);




INSERT INTO client VALUES (
 client_t(
   1,
   'John',
   'Smith',
   address_t(3, 'East Av', 'Bentley', 'WA', '6102'),
   investment_list(
     investment_t((SELECT REF(s) FROM stock s WHERE s.company = 'BHP'),
12.00, DATE '2001-10-02', 1000),
     investment_t((SELECT REF(s) FROM stock s WHERE s.company = 'BHP'),
10.50, DATE '2002-06-08', 2000),
     investment_t((SELECT REF(s) FROM stock s WHERE s.company = 'IBM'),
58.00, DATE '2000-02-12', 500),
     investment_t((SELECT REF(s) FROM stock s WHERE s.company = 'IBM'),
65.00, DATE '2001-04-10', 1200),
     investment_t((SELECT REF(s) FROM stock s WHERE s.company = 'INFOSYS'),
64.00, DATE '2001-08-11', 1000)
   )
 )
);

INSERT INTO client VALUES (
```

```
  client_t(
    2,
    'Jill',
    'Brody',
    address_t(42, 'Bent St', 'Perth', 'WA', '6001'),
    investment_list(
      investment_t((SELECT REF(s) FROM stock s WHERE s.company = 'INTEL'),
35.00, DATE '2000-01-30', 300),
      investment_t((SELECT REF(s) FROM stock s WHERE s.company = 'INTEL'),
54.00, DATE '2001-01-30', 400),
      investment_t((SELECT REF(s) FROM stock s WHERE s.company = 'INTEL'),
60.00, DATE '2001-10-02', 200),
      investment_t((SELECT REF(s) FROM stock s WHERE s.company = 'FORD'),
40.00, DATE '1999-10-05', 300),
      investment_t((SELECT REF(s) FROM stock s WHERE s.company = 'GM'),
55.50, DATE '2000-12-12', 500)
    )
  )
);
```

3.
(a)
```
SELECT
  c.client_no,
  c.firstname || ' ' || c.lastname AS client_name,
  i.company.company      AS stock_name,
  i.company.current_price AS current_price,
  i.company.last_dividend AS last_dividend,
  i.company.eps          AS earnings_per_share
FROM
  client c,
  TABLE(c.investments) i
ORDER BY
  c.client_no, stock_name;
```

CLIENT_NO	CLIENT_NAME	STOCK_NAME	CURRENT_PRICE	LAST_DIVIDEND	EARNINGS_PER_SHARE
1	John Smith	BHP	10.50	1.50	3.20
1	John Smith	BHP	10.50	1.50	3.20
1	John Smith	IBM	70.00	4.25	10.00
1	John Smith	IBM	70.00	4.25	10.00
1	John Smith	INFOSYS	45.00	3.00	7.80
2	Jill Brody	FORD	40.00	2.00	8.50
2	Jill Brody	GM	60.00	2.50	9.20
2	Jill Brody	INTEL	76.50	5.00	12.40
2	Jill Brody	INTEL	76.50	5.00	12.40
2	Jill Brody	INTEL	76.50	5.00	12.40

10 rows selected.

(b)
```
SELECT
    c.firstname || ' ' || c.lastname AS client_name,
    i.company.company AS stock_name,
    SUM(i.qty) AS total_shares,
    ROUND(SUM(i.qty * i.purchase_price)/SUM(i.qty), 2) AS
avg_purchase_price
FROM
    client c,
    TABLE(c.investments) i
GROUP BY
    c.firstname, c.lastname, i.company.company
ORDER BY
    c.firstname, c.lastname, i.company.company;
```

CLIENT_NAME	STOCK_NAME	TOTAL_SHARES	AVG_PURCHASE_PRICE
Jill Brody	FORD	300	40
Jill Brody	GM	500	55.5
Jill Brody	INTEL	900	49
John Smith	BHP	3000	11
John Smith	IBM	1700	62.94
John Smith	INFOSYS	1000	64

6 rows selected.

(c)
```
SELECT
    i.company.company AS stock_name,
    c.firstname || ' ' || c.lastname AS client_name,
    i.qty AS shares_held,
    i.qty * i.company.current_price AS current_value
FROM
    client c,
    TABLE(c.investments) i,
    TABLE (i.company.exchanges) e
WHERE
    e.COLUMN_VALUE = 'New York'
ORDER BY
    stock_name, client_name;
```

STOCK_NAME	CLIENT_NAME	SHARES_HELD	CURRENT_VALUE
BHP	John Smith	1000	10500
BHP	John Smith	2000	21000
FORD	Jill Brody	300	12000
GM	Jill Brody	500	30000
IBM	John Smith	500	35000
IBM	John Smith	1200	84000
INFOSYS	John Smith	1000	45000
INTEL	Jill Brody	200	15300
INTEL	Jill Brody	300	22950
INTEL	Jill Brody	400	30600

10 rows selected.

(d)
```
SELECT
   c.firstname || ' ' || c.lastname AS client_name,
   SUM(i.purchase_price * i.qty) AS total_portfolio_value
FROM
   client c,
   TABLE(c.investments) i
GROUP BY
   c.firstname, c.lastname
ORDER BY
   client_name;
```

CLIENT_NAME	TOTAL_PORTFOLIO_VALUE
Jill Brody	83850
John Smith	204000

(e)
```
SELECT
   c.firstname || ' ' || c.lastname AS client_name,
   SUM ((i.company.current_price * i.qty) - (i.purchase_price * i.qty)) AS
book_profit
FROM
   client c,
   TABLE(c.investments) i
GROUP BY
   c.firstname, c.lastname
ORDER BY
   client_name;
```

CLIENT_NAME	BOOK_PROFIT
Jill Brody	27000
John Smith	-8500

4.
-- 1. John sells all INFOSYS stocks to Jill at current price

```
INSERT INTO TABLE (
 SELECT c.investments
 FROM   client c
 WHERE  c.firstname = 'Jill'
 AND    c.lastname  = 'Brody'
)
```

```sql
SELECT investment_t(
      i.company,                        -- keep REF to stock_t
      DEREF(i.company).current_price,    -- today's price
      SYSDATE,                          — today
      i.qty                             -- same quantity
      )
FROM   client c,
      TABLE(c.investments) i
WHERE  c.firstname = 'John'
AND    c.lastname  = 'Smith'
AND    DEREF(i.company).company = 'INFOSYS';



-- Remove INFOSYS from John

DELETE FROM TABLE (
 SELECT c.investments
 FROM   client c
 WHERE  c.firstname = 'John'
 AND    c.lastname  = 'Smith'
)
WHERE  DEREF(company).company = 'INFOSYS';



-- 2. Jill sells all GM stocks to John at current price

INSERT INTO TABLE (
 SELECT c.investments
 FROM   client c
 WHERE  c.firstname = 'John'
 AND    c.lastname  = 'Smith'
)

SELECT investment_t(
```

```sql
        i.company,
        DEREF(i.company).current_price,
        SYSDATE,
        i.qty
        )
FROM    client c,
        TABLE(c.investments) i
WHERE   c.firstname = 'Jill'
AND     c.lastname  = 'Brody'
AND     DEREF(i.company).company = 'GM';


-- Remove GM from Jill

DELETE FROM TABLE (
  SELECT c.investments
  FROM   client c
  WHERE  c.firstname = 'Jill'
  AND    c.lastname  = 'Brody'
)
WHERE  DEREF(company).company = 'GM';


SELECT
  c.firstname || ' ' || c.lastname AS client_name,
  DEREF(i.company).company        AS stock,
  i.qty,
  i.purchase_price,
  TRUNC(i.purchase_date)   AS purchase_date
  FROM client c, TABLE(c.investments) i
 WHERE DEREF(i.company).company IN ('INFOSYS','GM')
 ORDER BY client_name, stock, i.purchase_date;
```

```
CLIENT_NAME                 STOCK                    QTY  PURCHASE_PRICE  PURCHASE_D
--------------------------- ------------------------------------------------- ------- --------------
----------
Jill Brody                  INFOSYS                 1000          45.00      15-AUG-25
John Smith                  GM                       500          60.00      15-AUG-25
```