

IT22186706

CREATE OR REPLACE TYPE AddressType AS OBJECT (

street_number NUMBER,

street_name VARCHAR2(50),

suburb VARCHAR2(50),

state VARCHAR2(10),

pin NUMBER(10)

);

CREATE OR REPLACE TYPE InvestmentType AS OBJECT (

company VARCHAR2(20),

purchase_price NUMBER(10,2),

purchase_date DATE,

quantity NUMBER(10)

);

CREATE OR REPLACE TYPE InvestmentTableType AS TABLE OF InvestmentType;

CREATE OR REPLACE TYPE ExchangeArrayType AS VARRAY(5) OF VARCHAR2(20);

```
CREATE TABLE Clients (  
    client_id NUMBER PRIMARY KEY,  
    firstname VARCHAR2(50),  
    lastname VARCHAR2(50),  
    address AddressType,  
    investments InvestmentTableType  
) NESTED TABLE investments STORE AS InvestmentsTable;
```

```
CREATE TABLE Stocks (  
    company VARCHAR2(20) PRIMARY KEY,  
    current_price NUMBER(10,2),  
    exchanges ExchangeArrayType,  
    last_dividend NUMBER(10,2),  
    earnings_per_share NUMBER(10,2)  
);
```

```
INSERT INTO Clients VALUES (
```

```
1, 'John', 'Smith',
```

```
AddressType(3, 'East Av', 'Bentley', 'WA', 6102),
```

```
InvestmentTableType(
```

```
InvestmentType('BHP', 12.00, TO_DATE('02/10/2001', 'DD/MM/YYYY'), 1000),
```

```
InvestmentType('BHP', 10.50, TO_DATE('08/06/2002', 'DD/MM/YYYY'), 2000),
```

```
InvestmentType('IBM', 58.00, TO_DATE('12/02/2000', 'DD/MM/YYYY'), 500),
```

```
InvestmentType('IBM', 65.00, TO_DATE('10/04/2001', 'DD/MM/YYYY'), 1200),
```

```
InvestmentType('INFOSYS', 64.00, TO_DATE('11/08/2001', 'DD/MM/YYYY'), 1000)
```

```
)
```

```
);
```

```
INSERT INTO Clients VALUES (
```

```
2, 'Jill', 'Brody',
```

```
AddressType(42, 'Bent St', 'Perth', 'WA', 6001),
```

```
InvestmentTableType(
```

```
InvestmentType('INTEL', 35.00, TO_DATE('30/01/2000', 'DD/MM/YYYY'), 300),
```

```
InvestmentType('INTEL', 54.00, TO_DATE('30/01/2001', 'DD/MM/YYYY'), 400),
```

```
InvestmentType('INTEL', 60.00, TO_DATE('02/10/2001', 'DD/MM/YYYY'), 200),
```

```
InvestmentType('FORD', 40.00, TO_DATE('05/10/1999', 'DD/MM/YYYY'), 300),
```

```
InvestmentType('GM', 55.50, TO_DATE('12/12/2000', 'DD/MM/YYYY'), 500)
```

```
)
```

);

```
INSERT INTO Stocks VALUES ('BHP', 10.50, ExchangeArrayType('Sydney', 'New York'), 1.50, 3.20);
```

```
INSERT INTO Stocks VALUES ('IBM', 70.00, ExchangeArrayType('New York', 'London', 'Tokyo'), 4.25, 10.00);
```

```
INSERT INTO Stocks VALUES ('INTEL', 76.50, ExchangeArrayType('New York', 'London'), 5.00, 12.40);
```

```
INSERT INTO Stocks VALUES ('FORD', 40.00, ExchangeArrayType('New York'), 2.00, 8.50);
```

```
INSERT INTO Stocks VALUES ('GM', 60.00, ExchangeArrayType('New York'), 2.50, 9.20);
```

```
INSERT INTO Stocks VALUES ('INFOSYS', 45.00, ExchangeArrayType('New York'), 3.00, 7.80);
```

```
SELECT c.firstname || ' ' || c.lastname AS client_name,  
       i.company, s.current_price, s.last_dividend, s.earnings_per_share  
FROM Clients c, TABLE(c.investments) i, Stocks s  
WHERE i.company = s.company;
```

```
SELECT c.firstname || ' ' || c.lastname AS client_name,  
       i.company,  
       SUM(i.quantity) AS total_shares,  
       ROUND(SUM(i.quantity * i.purchase_price) / SUM(i.quantity), 2) AS avg_price  
FROM Clients c, TABLE(c.investments) i
```

```
GROUP BY c.firstname, c.lastname, i.company;
```

```
SELECT i.company,
```

```
    c.firstname || ' ' || c.lastname AS client_name,
```

```
    SUM(i.quantity) AS total_shares,
```

```
    SUM(i.quantity * s.current_price) AS current_value
```

```
FROM Clients c,
```

```
    TABLE(c.investments) i,
```

```
    Stocks s,
```

```
    TABLE(s.exchanges) e    -- expand the varray into rows
```

```
WHERE i.company = s.company
```

```
    AND e.COLUMN_VALUE = 'New York'
```

```
GROUP BY i.company, c.firstname, c.lastname;
```

```
SELECT c.firstname || ' ' || c.lastname AS client_name,  
       SUM(i.quantity * i.purchase_price) AS total_purchase_value  
FROM Clients c, TABLE(c.investments) i  
GROUP BY c.firstname, c.lastname;
```

```
SELECT c.firstname || ' ' || c.lastname AS client_name,  
       SUM(i.quantity * s.current_price) - SUM(i.quantity * i.purchase_price) AS book_profit  
FROM Clients c, TABLE(c.investments) i, Stocks s  
WHERE i.company = s.company  
GROUP BY c.firstname, c.lastname;
```

```
UPDATE Clients c  
SET c.investments =  
    (SELECT CAST(  
        MULTISET (  
            SELECT VALUE(i)  
            FROM TABLE(c.investments) i
```

```
        WHERE i.company <> 'INFOSYS'
    ) AS InvestmentTableType
)
FROM dual)
WHERE c.client_id = 1;
```

```
UPDATE Clients c
SET c.investments =
    (SELECT CAST(
        MULTISET (
            SELECT i FROM TABLE(c.investments) i WHERE i.company != 'GM'
        ) AS InvestmentTableType)
    FROM dual)
WHERE c.client_id = 2;
```

```
UPDATE Clients c
SET c.investments = c.investments MULTISET UNION InvestmentTableType(
    InvestmentType('INFOSYS', 45.00, SYSDATE, 1000)
)
WHERE c.client_id = 2;
```

```
UPDATE Clients c
SET c.investments = c.investments MULTISET UNION InvestmentTableType(
    InvestmentType('GM', 60.00, SYSDATE, 500)
)
WHERE c.client_id = 1;
```