

## PROGRAM 6

Consider the following relations for an Order Processing database application in a company.

**CUSTOMER** (CUST #: int, cname: String, city: String)

**ORDER** (order #: int, odate: date, cust #: int, ord-Amt: int)

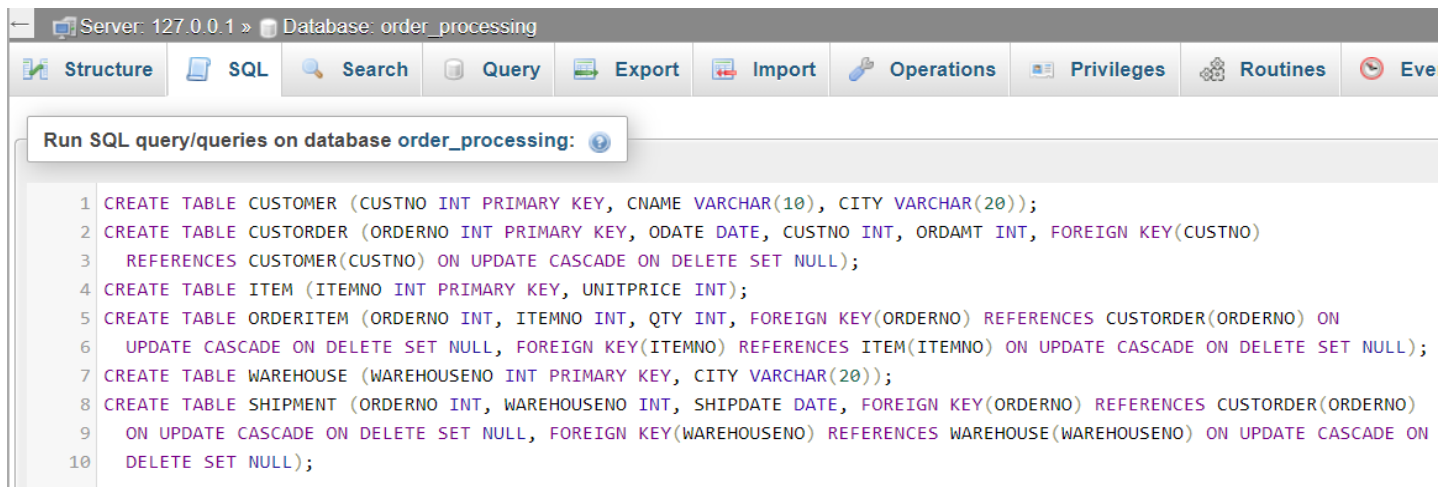
**ITEM** (item #: int, unit-price: int)

**ORDER-ITEM** (order #: int, item #: int, qty: int)

**WAREHOUSE** (warehouse #: int, city: String)

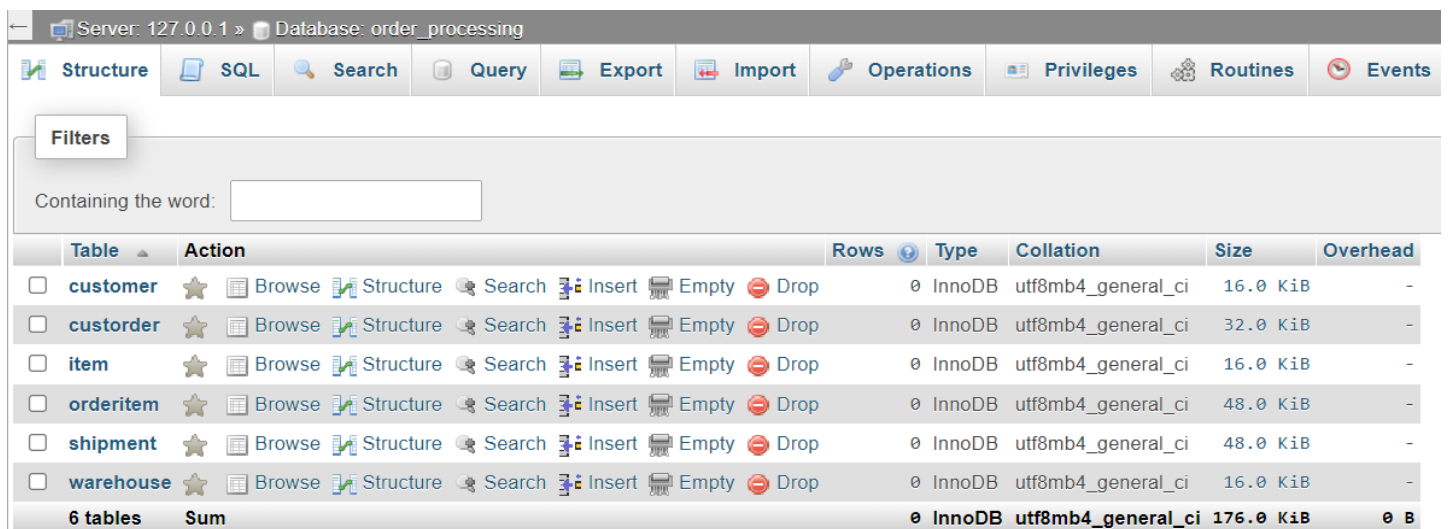
**SHIPMENT** (order #: int, warehouse #: int, ship-date: date)

i. Create the above tables by properly specifying the primary keys and the foreign keys and the foreign keys.



The screenshot shows a database management tool interface with a menu bar (Structure, SQL, Search, Query, Export, Import, Operations, Privileges, Routines, Events) and a toolbar. The main area displays a SQL query window titled "Run SQL query/queries on database order\_processing:". The query contains 10 lines of SQL code for creating tables and their relationships.

```
1 CREATE TABLE CUSTOMER (CUSTNO INT PRIMARY KEY, CNAME VARCHAR(10), CITY VARCHAR(20));
2 CREATE TABLE CUSTORDER (ORDERNO INT PRIMARY KEY, ODATE DATE, CUSTNO INT, ORDAMT INT, FOREIGN KEY(CUSTNO)
3 REFERENCES CUSTOMER(CUSTNO) ON UPDATE CASCADE ON DELETE SET NULL);
4 CREATE TABLE ITEM (ITEMNO INT PRIMARY KEY, UNITPRICE INT);
5 CREATE TABLE ORDERITEM (ORDERNO INT, ITEMNO INT, QTY INT, FOREIGN KEY(ORDERNO) REFERENCES CUSTORDER(ORDERNO) ON
6 UPDATE CASCADE ON DELETE SET NULL, FOREIGN KEY(ITEMNO) REFERENCES ITEM(ITEMNO) ON UPDATE CASCADE ON DELETE SET NULL);
7 CREATE TABLE WAREHOUSE (WAREHOUSENO INT PRIMARY KEY, CITY VARCHAR(20));
8 CREATE TABLE SHIPMENT (ORDERNO INT, WAREHOUSENO INT, SHIPDATE DATE, FOREIGN KEY(ORDERNO) REFERENCES CUSTORDER(ORDERNO)
9 ON UPDATE CASCADE ON DELETE SET NULL, FOREIGN KEY(WAREHOUSENO) REFERENCES WAREHOUSE(WAREHOUSENO) ON UPDATE CASCADE ON
10 DELETE SET NULL);
```



The screenshot shows the same database management tool interface, but with the "Structure" tab selected. It displays a list of tables in the database "order\_processing". The table list includes columns for Table, Action, Rows, Type, Collation, Size, and Overhead. The tables listed are customer, custorder, item, orderitem, shipment, and warehouse, each with a size of 16.0 KiB or 48.0 KiB.

Table	Action	Rows	Type	Collation	Size	Overhead
customer	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
custorder	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	32.0 KiB	-
item	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
orderitem	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	48.0 KiB	-
shipment	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	48.0 KiB	-
warehouse	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
6 tables	Sum	0	InnoDB	utf8mb4_general_ci	176.0 KiB	0 B

ii. Enter at least five tuples for each relation.

‘CUSTOMER’ table:

Server: 127.0.0.1 » Database: order\_processing » Table: customer

[Browse](#) [Structure](#) [SQL](#) [Search](#) [Insert](#)

Run SQL query/queries on table order\_processing.customer: ?

```
1 INSERT INTO CUSTOMER VALUES (1, 'Connor', 'Bangalore');
2 INSERT INTO CUSTOMER VALUES (2, 'Asher', 'Mumbai');
3 INSERT INTO CUSTOMER VALUES (3, 'Frank', 'Jaipur');
4 INSERT INTO CUSTOMER VALUES (4, 'Laurel', 'Guwahati');
5 INSERT INTO CUSTOMER VALUES (5, 'Jack', 'Bangalore');
6 INSERT INTO CUSTOMER VALUES (6, 'Nate', 'Mumbai');
```

Server: 127.0.0.1 » Database: order\_processing » Table: customer

[Browse](#) [Structure](#) [SQL](#) [Search](#) [Insert](#)

✓ Showing rows 0 - 5 (6 total, Query took 0.0005 seconds.)

SELECT \* FROM `customer`

☐ Show all | Number of rows: 25 ▼ Filter rows:

+ Options

				CUSTNO	CNAME	CITY
<input type="checkbox"/>	 Edit	 Copy	 Delete	1	Connor	Bangalore
<input type="checkbox"/>	 Edit	 Copy	 Delete	2	Asher	Mumbai
<input type="checkbox"/>	 Edit	 Copy	 Delete	3	Frank	Jaipur
<input type="checkbox"/>	 Edit	 Copy	 Delete	4	Laurel	Guwahati
<input type="checkbox"/>	 Edit	 Copy	 Delete	5	Jack	Bangalore
<input type="checkbox"/>	 Edit	 Copy	 Delete	6	Nate	Mumbai

## 'CUSTORDER' table:

← Server: 127.0.0.1 » Database: order\_processing » Table: custorder

Browse Structure SQL Search Insert

Run SQL query/queries on table order\_processing.custorder: ?

```
1 INSERT INTO CUSTORDER VALUES (1, '2021-06-01', 1, 1000);
2 INSERT INTO CUSTORDER VALUES (2, '2021-06-02', 1, 1500);
3 INSERT INTO CUSTORDER VALUES (3, '2021-06-03', 3, 1600);
4 INSERT INTO CUSTORDER VALUES (4, '2021-06-04', 2, 1700);
5 INSERT INTO CUSTORDER VALUES (5, '2021-06-05', 4, 1200);
6 INSERT INTO CUSTORDER VALUES (6, '2021-06-06', 5, 1100);
7 INSERT INTO CUSTORDER VALUES (7, '2021-06-07', 2, 1890);
8 INSERT INTO CUSTORDER VALUES (8, '2021-06-08', 4, 2000);
```

← Server: 127.0.0.1 » Database: order\_processing » Table: custorder

Browse Structure SQL Search Insert Export

✓ Showing rows 0 - 7 (8 total, Query took 0.0005 seconds.)

SELECT \* FROM `custorder`

☐ Show all | Number of rows: 25 ▾ Filter rows:

+ Options

▾				ORDERNO	ODATE	CUSTNO	ORDAMT
<input type="checkbox"/>	Edit	Copy	Delete	1	2021-06-01	1	1000
<input type="checkbox"/>	Edit	Copy	Delete	2	2021-06-02	1	1500
<input type="checkbox"/>	Edit	Copy	Delete	3	2021-06-03	3	1600
<input type="checkbox"/>	Edit	Copy	Delete	4	2021-06-04	2	1700
<input type="checkbox"/>	Edit	Copy	Delete	5	2021-06-05	4	1200
<input type="checkbox"/>	Edit	Copy	Delete	6	2021-06-06	5	1100
<input type="checkbox"/>	Edit	Copy	Delete	7	2021-06-07	2	1890
<input type="checkbox"/>	Edit	Copy	Delete	8	2021-06-08	4	2000

## 'ITEM' table:

Server: 127.0.0.1 » Database: order\_processing » Table: item

[Browse](#) [Structure](#) [SQL](#) [Search](#) [Insert](#)

Run SQL query/queries on table order\_processing.item: ?

```
1 INSERT INTO ITEM VALUES (1,1000);
2 INSERT INTO ITEM VALUES (2,100);
3 INSERT INTO ITEM VALUES (3,900);
4 INSERT INTO ITEM VALUES (4,700);
5 INSERT INTO ITEM VALUES (5,800);
6 INSERT INTO ITEM VALUES (6,750);
7 INSERT INTO ITEM VALUES (7,850);
8 INSERT INTO ITEM VALUES (8,950);
9 INSERT INTO ITEM VALUES (9,990);
10 INSERT INTO ITEM VALUES (10,999);
```

Server: 127.0.0.1 » Database: order\_processing » Table: item































[Browse](#) [Structure](#) [SQL](#) [Search](#) [Insert](#)

✓ Showing rows 0 - 9 (10 total, Query took 0.0005 seconds.)

```
SELECT * FROM `item`
```

☐ Show all | Number of rows:  Filter rows:

+ Options

			ITEMNO	UNITPRICE
<input type="checkbox"/>	 Edit	 Copy	 Delete	11000
<input type="checkbox"/>	 Edit	 Copy	 Delete	2100
<input type="checkbox"/>	 Edit	 Copy	 Delete	3900
<input type="checkbox"/>	 Edit	 Copy	 Delete	4700
<input type="checkbox"/>	 Edit	 Copy	 Delete	5800
<input type="checkbox"/>	 Edit	 Copy	 Delete	6750
<input type="checkbox"/>	 Edit	 Copy	 Delete	7850
<input type="checkbox"/>	 Edit	 Copy	 Delete	8950
<input type="checkbox"/>	 Edit	 Copy	 Delete	9990
<input type="checkbox"/>	 Edit	 Copy	 Delete	10999

## 'ORDERITEM' table:

Server: 127.0.0.1 » Database: order\_processing » Table: orderitem

[Browse](#) [Structure](#) [SQL](#) [Search](#) [Insert](#)

Run SQL query/queries on table order\_processing.orderitem: ?

```
1 INSERT INTO ORDERITEM VALUES (1,9,1);
2 INSERT INTO ORDERITEM VALUES (2,8,1);
3 INSERT INTO ORDERITEM VALUES (3,7,1);
4 INSERT INTO ORDERITEM VALUES (4,6,1);
5 INSERT INTO ORDERITEM VALUES (5,5,1);
6 INSERT INTO ORDERITEM VALUES (6,4,1);
7 INSERT INTO ORDERITEM VALUES (7,3,1);
8 INSERT INTO ORDERITEM VALUES (8,10,1);
9 INSERT INTO ORDERITEM VALUES (8,1,1);
10 INSERT INTO ORDERITEM VALUES (7,2,8);
```

Server: 127.0.0.1 » Database: order\_processing » Table: orderitem

[Browse](#) [Structure](#) [SQL](#) [Search](#) [Insert](#)

⚠ Current selection does not contain a unique column. Grid edit

✓ Showing rows 0 - 9 (10 total, Query took 0.0004 seconds.)

```
SELECT * FROM `orderitem`
```

☐ Show all | Number of rows: 25 ▾ Filter rows:

+ Options

ORDERNO	ITEMNO	QTY
1	9	1
2	8	1
3	7	1
4	6	1
5	5	1
6	4	1
7	3	1
8	10	1
8	1	1
7	2	8

## 'WAREHOUSE' table:

Server: 127.0.0.1 » Database: order\_processing » Table: warehouse

[Browse](#) [Structure](#) [SQL](#) [Search](#) [Insert](#)

Run SQL query/queries on table order\_processing.warehouse: ?

```
1 INSERT INTO WAREHOUSE VALUES (1,'Bangalore');
2 INSERT INTO WAREHOUSE VALUES (2,'Mumbai');
3 INSERT INTO WAREHOUSE VALUES (3,'Delhi');
4 INSERT INTO WAREHOUSE VALUES (4,'Chennai');
5 INSERT INTO WAREHOUSE VALUES (5,'Delhi');
6 INSERT INTO WAREHOUSE VALUES (6,'Bangalore');
```

Server: 127.0.0.1 » Database: order\_processing » Table: warehouse

[Browse](#) [Structure](#) [SQL](#) [Search](#) [Insert](#)

✓ Showing rows 0 - 5 (6 total, Query took 0.0005 seconds.)

SELECT \* FROM `warehouse`

☐ Show all | Number of rows: 25 ▼ Filter rows:

+ Options

				WAREHOUSENO	CITY
<input type="checkbox"/>				1	Bangalore
<input type="checkbox"/>				2	Mumbai
<input type="checkbox"/>				3	Delhi
<input type="checkbox"/>				4	Chennai
<input type="checkbox"/>				5	Delhi
<input type="checkbox"/>				6	Bangalore

## 'SHIPMENT' table:

Server: 127.0.0.1 » Database: order\_processing » Table: shipment

[Browse](#) [Structure](#) [SQL](#) [Search](#) [Insert](#)

Run SQL query/queries on table order\_processing.shipment: ?

```
1 INSERT INTO SHIPMENT VALUES (1,5,'2021-06-08');
2 INSERT INTO SHIPMENT VALUES (2,2,'2021-06-08');
3 INSERT INTO SHIPMENT VALUES (3,6,'2021-06-08');
4 INSERT INTO SHIPMENT VALUES (4,1,'2021-06-08');
5 INSERT INTO SHIPMENT VALUES (5,6,'2021-06-08');
6 INSERT INTO SHIPMENT VALUES (6,5,'2021-06-08');
7 INSERT INTO SHIPMENT VALUES (7,4,'2021-06-08');
8 INSERT INTO SHIPMENT VALUES (8,3,'2021-06-08');
```

Server: 127.0.0.1 » Database: order\_processing » Table: shipment

[Browse](#) [Structure](#) [SQL](#) [Search](#) [Insert](#)

⚠ Current selection does not contain a unique column. Grid edit, checkbox, Ed

✓ Showing rows 0 - 7 (8 total, Query took 0.0006 seconds.)

```
SELECT * FROM `shipment`
```

☐ Show all | Number of rows: 25 ▼ Filter rows: Search this table

+ Options

ORDERNO	WAREHOUSENO	SHIPDATE
1	5	2021-06-08
2	2	2021-06-08
3	6	2021-06-08
4	1	2021-06-08
5	6	2021-06-08
6	5	2021-06-08
7	4	2021-06-08
8	3	2021-06-08



iii. Produce a listing: CUSTNAME, #oforders, AVG\_ORDER\_AMT, where the middle column is the total numbers of orders by the customer and the last column is the average order amount for that customer.

Query:

```
SELECT C.CNAME, COUNT(O.ORDERNO) AS NUMBER_OF_ORDERS, AVG(O.ORDAMT) AS  
AVG_ORDER_AMT FROM CUSTOMER C, CUSTORDER O WHERE C.CUSTNO=O.CUSTNO GROUP  
BY C.CNAME ORDER BY C.CNAME ASC;
```

Server: 127.0.0.1 » Database: order\_processing

StructureSQLSearchQueryExportImportOperations

Run SQL query/queries on database order\_processing: ?

1 SELECT C.CNAME, COUNT(O.ORDERNO) AS NUMBER\_OF\_ORDERS, AVG(O.ORDAMT) AS AVG\_ORDER\_AMT  
2 FROM CUSTOMER C, CUSTORDER O  
3 WHERE C.CUSTNO=O.CUSTNO  
4 GROUP BY C.CNAME  
5 ORDER BY C.CNAME ASC;

Server: 127.0.0.1 » Database: order\_processing » Table: CUSTOMER

BrowseStructureSQLSearchInsertEx

Show query box

✓ Showing rows 0 - 4 (5 total, Query took 0.0019 seconds.) [CNAME: ASHER... - I

SELECT C.CNAME, COUNT(O.ORDERNO) AS NUMBER\_OF\_ORDERS, AVG(O.ORDAMT)  
C.CNAME ASC

☐ Show all | Number of rows: 25 ▼ Filter rows: Search this table

+ Options

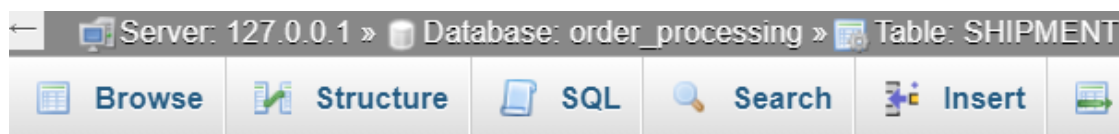
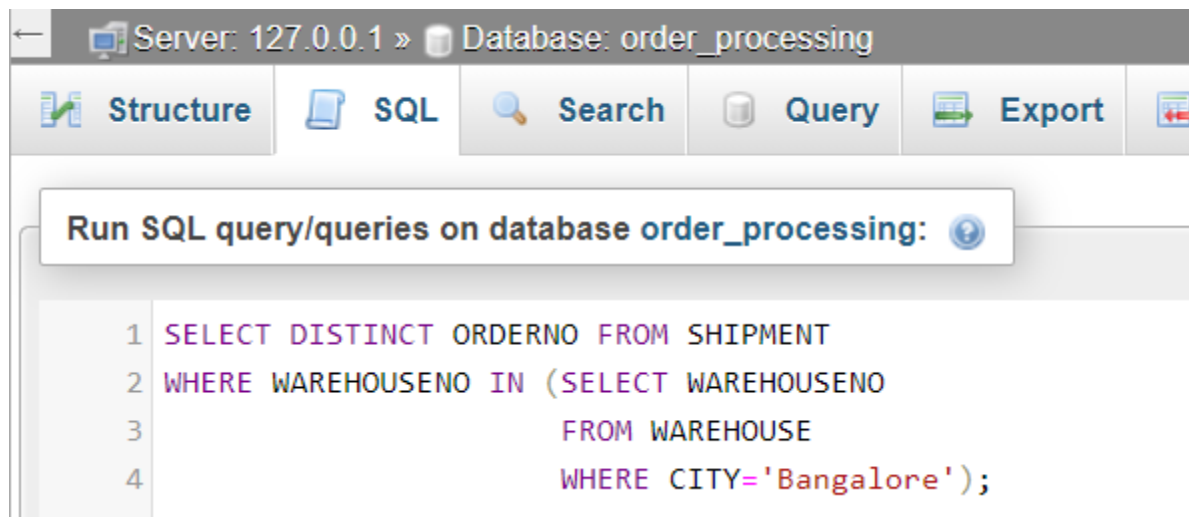
CNAME ▲ 1	NUMBER_OF_ORDERS	AVG_ORDER_AMT
Asher	2	1795.0000
Connor	2	1250.0000
Frank	1	1600.0000
Jack	1	1100.0000
Laurel	2	1600.0000



iv. List the order# for orders that were shipped from all warehouses that the company has in a specific city.

Query:

```
SELECT DISTINCT ORDERNO FROM SHIPMENT WHERE WAREHOUSENO IN (SELECT WAREHOUSENO FROM WAREHOUSE WHERE CITY='Bangalore');
```



Show query box

⚠ Current selection does not contain a unique column. Grid edit, checkbox, Edit

✓ Showing rows 0 - 2 (3 total, Query took 0.0376 seconds.)

```
SELECT DISTINCT ORDERNO FROM SHIPMENT WHERE WAREHOUSENO IN (SELEC
```

☐ Show all | Number of rows: 25 ▼ Filter rows: Search this table

+ Options

ORDERNO

3

4

5

v. Demonstrate how you delete item# 10 from the ITEM table and make that field null in the ORDER\_ITEM table.

Query:

```
DELETE FROM ITEM WHERE ITEMNO=10;
```

Server: 127.0.0.1 » Database: order\_processing

Structure SQL Search Query Export

Run SQL query/queries on database order\_processing: ?

```
1 DELETE FROM ITEM WHERE ITEMNO=10;
```

Server: 127.0.0.1 » Database: order\_processing » Table: orderitem

Browse Structure SQL Search Insert E

⚠ Current selection does not contain a unique column. Grid edit, checkbox, Edit, ...

✓ Showing rows 0 - 9 (10 total, Query took 0.0006 seconds.) [ITEMNO: ... - 9...]

```
SELECT * FROM `orderitem` ORDER BY `ITEMNO` ASC
```

☐ Show all | Number of rows: 25 ▼ | Filter rows: Search this table

+ Options

ORDERNO	ITEMNO	QTY
8	NULL	1
8	1	1
7	2	8
7	3	1
6	4	1
5	5	1
4	6	1
3	7	1
2	8	1
1	9	1