

Task1

We have 2 data types to store large objects:

blob(binary large object)- Stores any kind of data in binary format. Typically used for multimedia data such as images, audio, and video.

clob(character large object)- Stores string data in the database character set format. Used for large strings or documents that use the database character set exclusively. Characters in the database character set are in a fixed width format.

Task2

Atomic permissions in SQL are called privileges, groups of permissions are called roles. Role- is a way to distinguish among various users as far as what these users can access/update in the database.

We can create users and configure their privileges or roles as we want.

In other word user is like a person, and a role is like his position or a group of privileges.

-- 1

```
CREATE ROLE accountant;
```

```
GRANT select ON accounts,transactions TO accountant;
```

```
CREATE ROLE administrator CREATEROLE;
```

```
GRANT all privileges ON accounts,transactions,customers TO administrator;
```

```
CREATE ROLE support;
```

```
GRANT select,insert ON accounts,transactions,customers TO support;
```

-- 2

```
CREATE USER user1;
```

```
CREATE USER user2;
```

```
CREATE USER user3;
```

```
GRANT accountant TO user1;
```

```
GRANT administrator TO user2;
```

```
GRANT support TO user3;
```

-- 3

```
GRANT all privileges ON accounts,transactions,customers TO user2 WITH GRANT OPTION;
```

-- 4

```
REVOKE insert ON accounts,transactions,customers FROM user3;
```

-- Task3

-- 2

```
ALTER TABLE transactions ALTER COLUMN amount SET NOT NULL;
```

```
ALTER TABLE transactions ALTER COLUMN status SET NOT NULL;
```

-- Task5

-- 1

```
CREATE UNIQUE INDEX cust_curr_idx ON accounts(customer_id,currency);
```

-- 2

```
CREATE INDEX curr_bal_idx ON accounts(currency,balance);
```

-- Task6

```
BEGIN;
```

```
INSERT INTO transactions VALUES(4, '2021-11-13 17:13:46.000000', 'RS88012', 'NT10204', 500, 'init');
```

```
UPDATE accounts SET balance=balance-500
```

```
WHERE accounts.account_id='RS88012'; -- 5000->4500
```

```
UPDATE accounts SET balance=balance+500
```

```
WHERE accounts.account_id='NT10204'; -- 1000->1500
```

```
UPDATE transactions SET status='committed' WHERE id=4;
```

```
COMMIT;
```