

```
C:\Users\Sandesh Khatiwada>docker run -d --name Sandesh_Cockroachdb -p 26257:26257 -p 9090:8080 -v "D:\Github\Advanced-Database:/cockroach/cockroach-data" cockroachdb/cockroach:latest start-single-node --insecure
2b3e282aa3bf90148a26a34afa0f42e0c0d751a419b8d9159968342c0a3c7b09
```

```
C:\Users\Sandesh Khatiwada>
```

Localhost:9090

The screenshot shows the CockroachDB Overview page. At the top, it displays the cluster ID: a26ad718-2025-4bf4-acad-95605386a3c2. Below this, there are three main sections: Capacity Usage, Node Status, and Replication Status. The Capacity Usage section shows 0.0% usage of 35.2 GiB, with 15.7 MiB used. The Node Status section shows 1 live node, 0 suspect nodes, 0 draining nodes, and 0 dead nodes. The Replication Status section shows 54 total ranges, 0 under-replicated ranges, and 0 unavailable ranges. Below these sections is a table titled 'Nodes (1)' listing one node: 127.0.0.1:26257 (n1), which has been up for 5 minutes, has 54 replicas, and 0% capacity usage.

SQL Shell:

The screenshot shows the CockroachDB SQL shell running in a Command Prompt window. It displays a welcome message for the CockroachDB SQL shell, noting the server version (CCL v25.4.1), cluster ID (a26ad718-2025-4bf4-acad-95605386a3c2), and a brief introduction. The prompt shows the user is connected to the default database at port 26257.

Create a database:

```
"root@localhost:26257/defaultdb> CREATE DATABASE oic;
CREATE DATABASE
Time: 62ms total (execution 61ms / network 1ms)
root@localhost:26257/defaultdb> █
M? toggle key help • C-d erase/stop • C-c clear/cancel • C-r search hist • M-. hide/show prompt
```

Use oic :

```
root@localhost:26257/defaultdb> USE oic;
SET

Time: 20ms total (execution 19ms / network 0ms)

root@localhost:26257/oic> █
M-? toggle key help • C-d erase/stop • C-c clear/cancel • C-r search hist • M-. hide/show prompt
```

Table creation:

```
root@localhost:26257/oic> CREATE TABLE oic.students (id INT PRIMARY KEY, marks DECIMAL);
CREATE TABLE

Time: 41ms total (execution 30ms / network 10ms)

root@localhost:26257/oic> █
M-? toggle key help • C-d erase/stop • C-c clear/cancel • C-r search hist • M-. hide/show prompt
```

View table:

```
root@localhost:26257/oic> CREATE TABLE oic.students (id INT PRIMARY KEY, marks DECIMAL);
CREATE TABLE

Time: 41ms total (execution 30ms / network 10ms)

root@localhost:26257/oic> SHOW TABLES;
+-----+-----+-----+-----+-----+
| schema_name | table_name | type | owner | estimated_row_count | locality |
+-----+-----+-----+-----+-----+
| public      | students    | table | root  |                      0 | NULL       |
(1 row)

Time: 61ms total (execution 60ms / network 1ms)

root@localhost:26257/oic> █
M-? toggle key help • C-d erase/stop • C-c clear/cancel • C-r search hist • M-. hide/show prompt
```

Insert and view database:

```
root@localhost:26257/oic> INSERT INTO oic.students VALUES (1, 55.45);
INSERT 0 1

Time: 16ms total (execution 15ms / network 0ms)

root@localhost:26257/oic> SELECT * FROM oic.students;
+-----+-----+
| id  | marks |
+-----+-----+
| 1   | 55.45 |
(1 row)

Time: 3ms total (execution 2ms / network 1ms)

root@localhost:26257/oic> █
M-? toggle key help • C-d erase/stop • C-c clear/cancel • C-r search hist • M-. hide/show prompt
```

PART 2: Scale to 3-Node Cluster

Exit SQL shell

Type: \q

```
root@localhost:26257/oic> \q  
C:\Users\Sandesh Khatiwada>
```

Stop single node container:

```
Command Prompt  
C:\Users\Sandesh Khatiwada>docker stop Sandesh_Cockroachdb  
Sandesh_Cockroachdb  
C:\Users\Sandesh Khatiwada>
```

Remove single-node container:

```
docker rm Sandesh_Cockroachdb
```

```
C:\Users\Sandesh Khatiwada>docker rm Sandesh_Cockroachdb  
Sandesh_Cockroachdb  
C:\Users\Sandesh Khatiwada>
```

Create docker network for 3-node cluster:

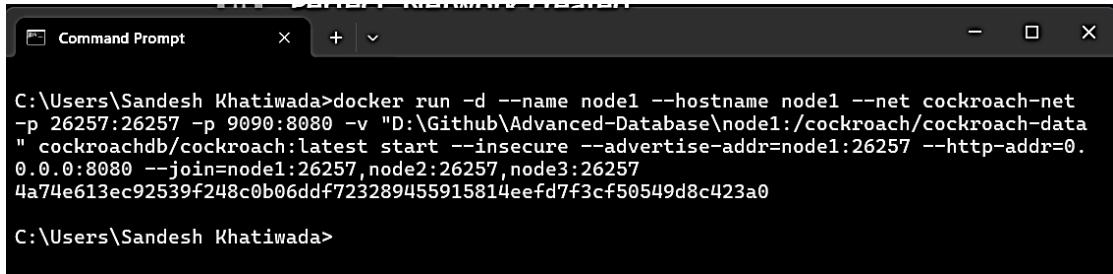
```
docker network create cockroach-net
```

```
Command Prompt  
C:\Users\Sandesh Khatiwada>docker network create cockroach-net  
53eb4b11a601362d7420111092a127072da97b9b0aab8c611f00151f5182e1b3  
C:\Users\Sandesh Khatiwada>
```

Start node1:

```
docker run -d --name node1 --hostname node1 --net cockroach-net -p 26257:26257 -p 9090:8080 -v "D:\Github\Advanced-Database\node1:/cockroach/cockroach-data"
```

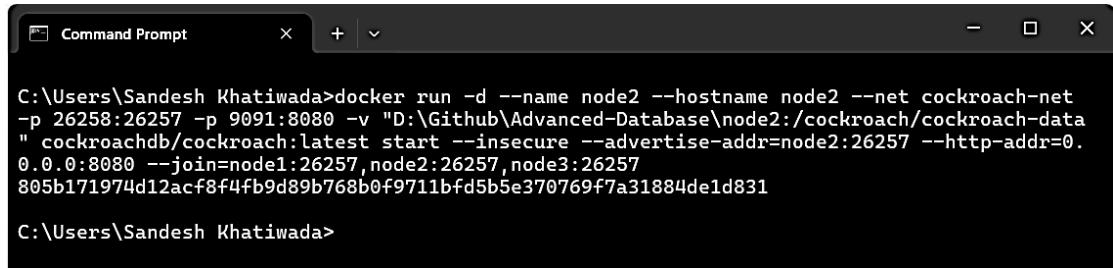
```
cockroachdb/cockroach:latest start --insecure --advertise-addr=node1:26257 --http-addr=0.0.0.0:8080 --join=node1:26257,node2:26257,node3:26257
```



```
C:\Users\Sandesh Khatiwada>docker run -d --name node1 --hostname node1 --net cockroach-net -p 26257:26257 -p 9090:8080 -v "D:\Github\Advanced-Database\node1:/cockroach/cockroach-data" cockroachdb/cockroach:latest start --insecure --advertise-addr=node1:26257 --http-addr=0.0.0.0:8080 --join=node1:26257,node2:26257,node3:26257  
4a74e613ec92539f248c0b06ddf723289455915814eef7f3cf50549d8c423a0  
C:\Users\Sandesh Khatiwada>
```

Start node 2:

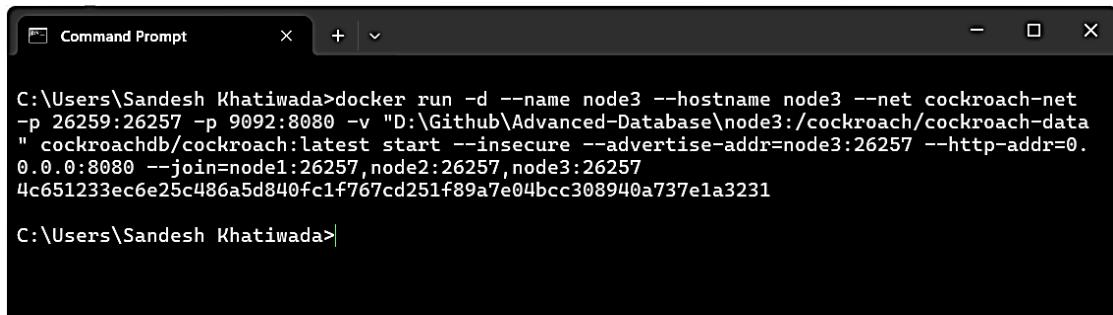
```
docker run -d --name node2 --hostname node2 --net cockroach-net -p 26258:26257 -p 9091:8080 -v "D:\Github\Advanced-Database\node2:/cockroach/cockroach-data" cockroachdb/cockroach:latest start --insecure --advertise-addr=node2:26257 --http-addr=0.0.0.0:8080 --join=node1:26257,node2:26257,node3:26257
```



```
C:\Users\Sandesh Khatiwada>docker run -d --name node2 --hostname node2 --net cockroach-net -p 26258:26257 -p 9091:8080 -v "D:\Github\Advanced-Database\node2:/cockroach/cockroach-data" cockroachdb/cockroach:latest start --insecure --advertise-addr=node2:26257 --http-addr=0.0.0.0:8080 --join=node1:26257,node2:26257,node3:26257  
805b171974d12acf8f4fb9d89b768b0f9711bfd5b5e370769f7a31884de1d831  
C:\Users\Sandesh Khatiwada>
```

Start node3:

```
docker run -d --name node3 --hostname node3 --net cockroach-net -p 26259:26257 -p 9092:8080 -v "D:\Github\Advanced-Database\node3:/cockroach/cockroach-data" cockroachdb/cockroach:latest start --insecure --advertise-addr=node3:26257 --http-addr=0.0.0.0:8080 --join=node1:26257,node2:26257,node3:26257
```



```
C:\Users\Sandesh Khatiwada>docker run -d --name node3 --hostname node3 --net cockroach-net -p 26259:26257 -p 9092:8080 -v "D:\Github\Advanced-Database\node3:/cockroach/cockroach-data" cockroachdb/cockroach:latest start --insecure --advertise-addr=node3:26257 --http-addr=0.0.0.0:8080 --join=node1:26257,node2:26257,node3:26257  
4c651233ec6e25c486a5d840fc1f767cd251f89a7e04bcc308940a737e1a3231  
C:\Users\Sandesh Khatiwada>
```

Initialize the server:

```
docker exec -it node1 ./cockroach init --insecure
```

```
C:\Users\Sandesh Khatiwada>docker exec -it node1 ./cockroach init --insecure
Cluster successfully initialized

C:\Users\Sandesh Khatiwada>
```

Checking if cluster is working:

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS
4c651233ec6e	cockroachdb/cockroach:latest	"/cockroach/cockroac..."	8 hours ago	Up 8 hours
805b171974d1	cockroachdb/cockroach:latest	"/cockroach/cockroac..."	8 hours ago	Up 8 hours
node1	cockroachdb/cockroach:latest	"/cockroach/cockroac..."		
Mongo_Auth_Sandesh	mongo:8.0		27/01/2024 07:01:17	N/A N/A

To confirm all 3 nodes are up and have same cluster:

Node 1:

The screenshot shows the CockroachDB Overview page with the following details:

- Cluster id:** 0ee852cc-a11e-4b13-9f96-e5f24d2b687a
- Capacity Usage:** 0.2% (Used: 149.3 MiB, Usable: 96.0 GiB)
- Node Status:** 3 LIVE NODES, 0 SUSPECT NODES, 0 DRAINING NODES, 0 DEAD NODES
- Replication Status:** 78 TOTAL RANGES, 0 UNDER-REPLICATED RANGES, 0 UNAVAILABLE RANGES
- Nodes (3):**

nodes	Uptime	Replicas	Capacity Usage	Memory Use	vCPUs	Version	Status	Logs
node1:26257 (n1)	3 minutes	78	0 %	19 %	8	v25.4.1	LIVE	Logs
node2:26257 (n2)	3 minutes	78	0 %	18 %	8	v25.4.1	LIVE	Logs
node3:26257 (n3)	3 minutes	78	0 %	17 %	8	v25.4.1	LIVE	Logs

Node 2:

A screenshot of a web browser window showing the CockroachDB Cluster Overview. The title bar reads "Cluster Overview | Cockroach Co x +". The address bar shows "localhost:9091/#/overview/list". Below the header, there is a logo for CockroachDB and the text "Cluster id: 0ee852cc-a11e-4b13-9f96-e5f24d2b687a".

Node 3:

A screenshot of a web browser window showing the CockroachDB Cluster Overview. The title bar reads "Cluster Overview | Cockroach Co x +". The address bar shows "localhost:9092/#/overview/list". Below the header, there is a logo for CockroachDB and the text "Cluster id: 0ee852cc-a11e-4b13-9f96-e5f24d2b687a".

Create Database under node 1:

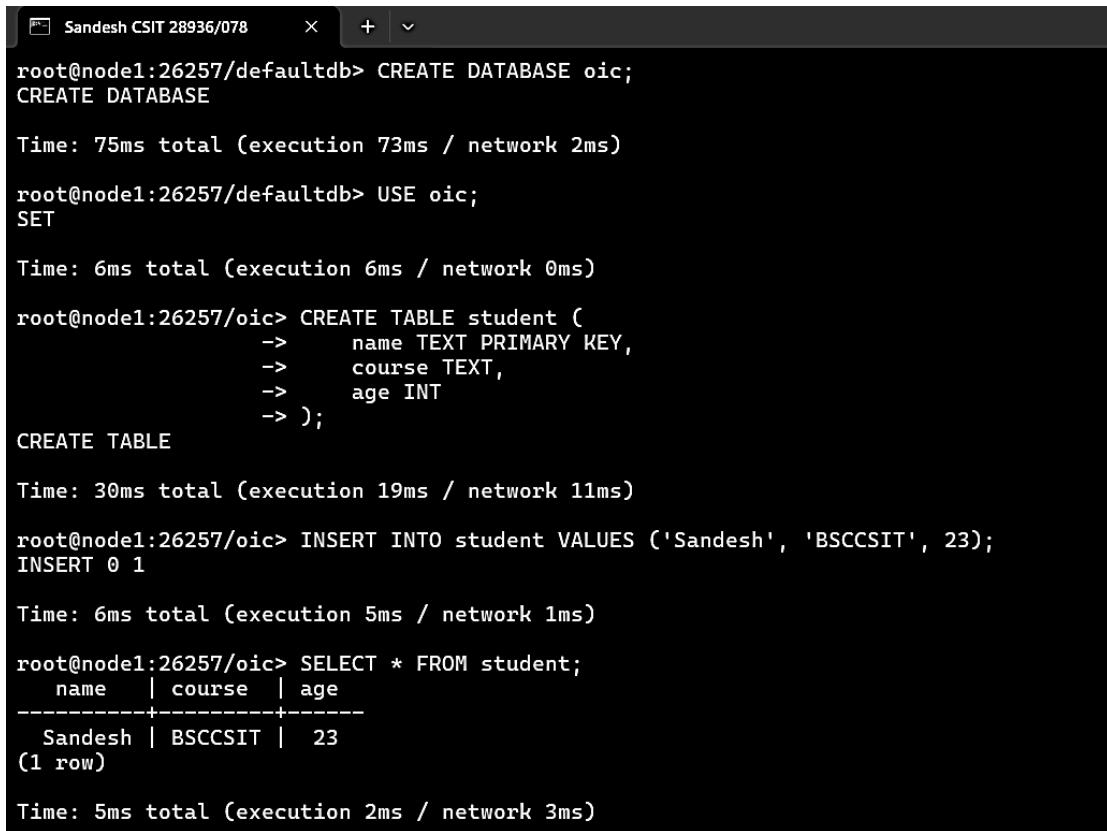
```
CREATE DATABASE oic;  
USE oic;  
CREATE TABLE student (  
    name TEXT PRIMARY KEY,  
    course TEXT,  
    age INT  
);
```

Insert:

```
INSERT INTO student VALUES ('Sandesh', 'BSCCSIT', 23);
```

View in node 1:

```
SELECT * FROM student;
```



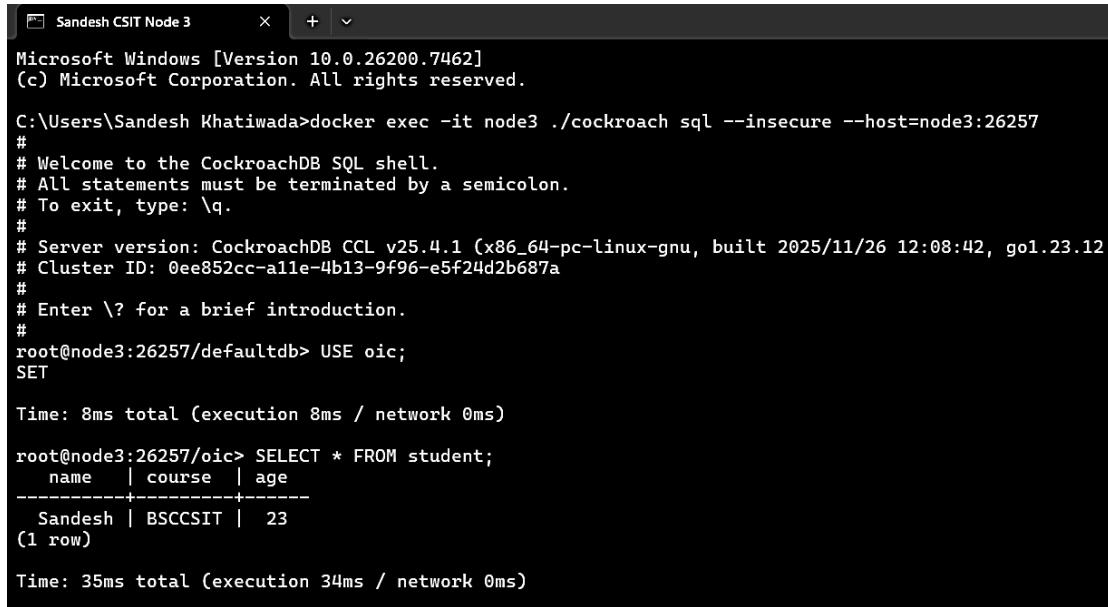
```
Sandesh CSIT 28936/078      x  +  v  
root@node1:26257/defaultdb> CREATE DATABASE oic;  
CREATE DATABASE  
  
Time: 75ms total (execution 73ms / network 2ms)  
  
root@node1:26257/defaultdb> USE oic;  
SET  
  
Time: 6ms total (execution 6ms / network 0ms)  
  
root@node1:26257/oic> CREATE TABLE student (  
    -->     name TEXT PRIMARY KEY,  
    -->     course TEXT,  
    -->     age INT  
    --> );  
CREATE TABLE  
  
Time: 30ms total (execution 19ms / network 11ms)  
  
root@node1:26257/oic> INSERT INTO student VALUES ('Sandesh', 'BSCCSIT', 23);  
INSERT 0 1  
  
Time: 6ms total (execution 5ms / network 1ms)  
  
root@node1:26257/oic> SELECT * FROM student;  
  name | course | age  
-----+-----+-----  
 Sandesh | BSCCSIT | 23  
(1 row)  
  
Time: 5ms total (execution 2ms / network 3ms)
```

Verify the database from node 3:

```
docker exec -it node3 ./cockroach sql --insecure --host=node3:26257
```

```
USE oic;
```

```
SELECT * FROM student;
```



The screenshot shows a Windows command-line interface window titled "Sandesh CSIT Node 3". The title bar also includes standard window controls (minimize, maximize, close) and a tab indicator. The main area of the window displays the following text:

```
Microsoft Windows [Version 10.0.26200.7462]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Sandesh Khatiwada>docker exec -it node3 ./cockroach sql --insecure --host=node3:26257
#
# Welcome to the CockroachDB SQL shell.
# All statements must be terminated by a semicolon.
# To exit, type: \q.
#
# Server version: CockroachDB CCL v25.4.1 (x86_64-pc-linux-gnu, built 2025/11/26 12:08:42, go1.23.12
# Cluster ID: 0ee852cc-a11e-4b13-9f96-e5f24d2b687a
#
# Enter \? for a brief introduction.
#
root@node3:26257/defaultdb> USE oic;
SET

Time: 8ms total (execution 8ms / network 0ms)

root@node3:26257/oic> SELECT * FROM student;
  name  | course  | age
-----+-----+
  Sandesh | BSACSIT | 23
(1 row)

Time: 35ms total (execution 34ms / network 0ms)
```