



**Department of Computer Science and Engineering (Data Science)**

**Subject: Big Data Engineering (DJ19DSL604)**

**AY: 2022-23**

**Experiment 6**

**(No SQL Data Store)**

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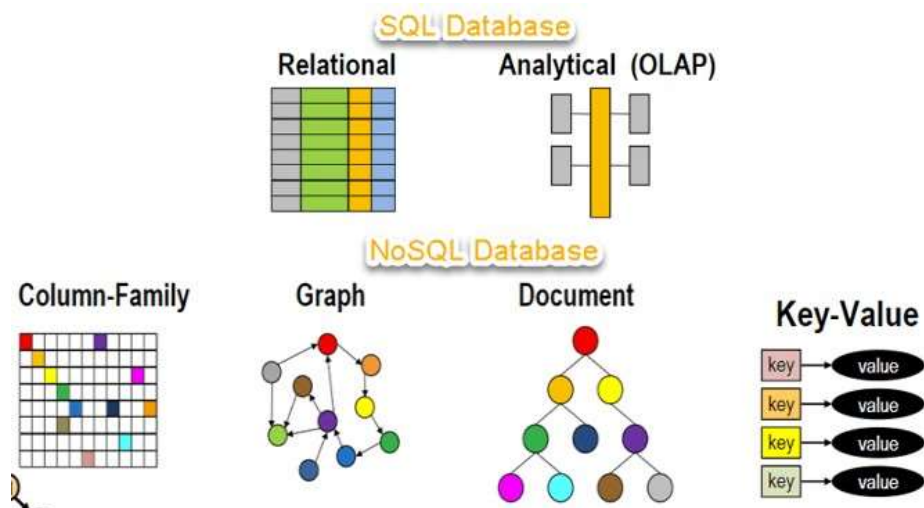
D22

**Aim:** Implement No SQL Data Store using HBase.

**Theory:**

**NoSQL:**

**NoSQL** Database is a non-relational Data Management System, that does not require a fixed schema. It avoids joins, and is easy to scale. The major purpose of using a NoSQL database is for distributed data stores with humongous data storage needs. NoSQL is used for Big data and realtime web apps. For example, companies like Twitter, Facebook and Google collect terabytes of user data every single day. **NoSQL database** stands for “Not Only SQL” or “Not SQL.”



**Difference between SQL and NoSQL data stores:**

- SQL databases are relational, and NoSQL databases are non-relational.
- SQL databases use structured query language (SQL) and have a predefined schema. NoSQL databases have dynamic schemas for unstructured data.
- SQL databases are vertically scalable, while NoSQL databases are horizontally scalable.
- SQL databases are table-based, while NoSQL databases are document, key-value, graph, or wide-column stores.



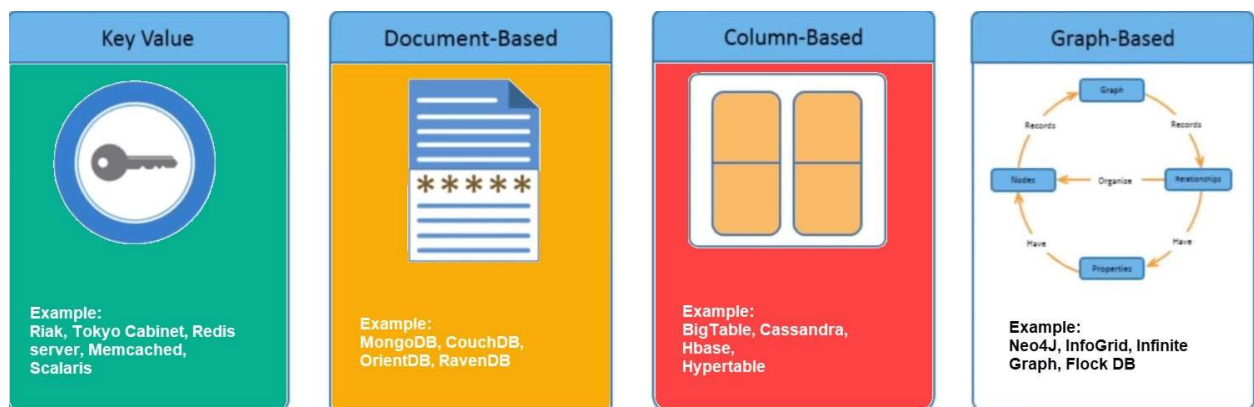
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- SQL databases are better for multi-row transactions, while NoSQL is better for unstructured data like documents or JSON.

### Types of NoSQL Databases

**NoSQL Databases** are mainly categorized into four types: Key-value pair, Column-oriented, Graph-based and Document-oriented. Every category has its unique attributes and limitations. None of the above-specified database is better to solve all the problems. Users should select the database based on their product needs. Types of NoSQL Databases:

- Key-value Pair Based
- Column-oriented Graph
- Graphs based
- Document-oriented



### Introduction to HBase

HBase is a distributed column-oriented database built on top of the Hadoop file system. It is an open-source project and is horizontally scalable.

HBase is a data model that is similar to Google's big table designed to provide quick random access to huge amounts of structured data. It leverages the fault tolerance provided by the Hadoop File System (HDFS).

It is a part of the Hadoop ecosystem that provides random real-time read/write access to data in the Hadoop File System.

One can store the data in HDFS either directly or through HBase. Data consumer reads/accesses the data in HDFS randomly using HBase. HBase sits on top of the Hadoop File System and provides read and write access.

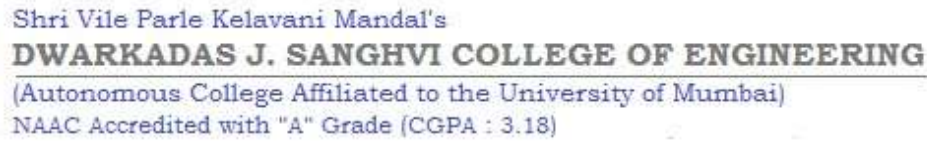
### HBASE Architecture

The diagram illustrates the Apache Hbase Architecture. At the top left is the **Client**. In the top center is the **HMaster**. To the right is the **ZooKeeper**. Below these are three **Region Server** boxes, each containing two **Region** boxes. At the bottom is the **HDFS** storage layer. Arrows indicate the following interactions: Client to HMaster and ZooKeeper; HMaster to all Region Servers; ZooKeeper to all Region Servers; each Region Server to HDFS; and bidirectional communication between each Region Server and its corresponding Region.

The diagram illustrates the HBase write and read paths across three Region Servers. Each Region Server contains a Region, a Memstore, and HFiles. A Client can perform a Write or Read operation. The Write path (green arrows) involves writing to the Memstore (2) and flushing to HFiles (3). The Read path (orange arrows) involves reading from the Memstore (5) and HFiles (6). A Write Ahead log (HDFS) is also shown at the bottom.

```
graph TD
    subgraph Region_Server [Region Server]
        subgraph Region_1 [Region 1]
            R1[Region 1] -- 2 --> M1[Memstore]
            M1 -- 3 --> F1[Flush]
            F1 --> H1[HFile]
            F1 --> H2[HFile]
        end
        subgraph Region_2 [Region 2]
            R2[Region 2]
            M2[Memstore]
            H3[HFile]
            H4[HFile]
        end
        subgraph Region_3 [Region 3]
            R3[Region 3]
            M3[Memstore]
            H5[HFile]
            H6[HFile]
        end
    end
    Client[Client] -- Write -- 1 --> R1
    Client -- Read -- 4 --> R3
    R3 -- 5 --> M3
    M3 -- 6 --> H5
    M3 -- 6 --> H6
    R1 -- 1 --> WAL[Write Ahead log HDFS]
```

### Lab Assignment:

[illegible]



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localhost:5000/master/cluster

HEARSE

Home

Table Details

Procedures & Logs

HBCK Report

Operation Details

Process Metrics

Local Logs

Log Level

Debug Dump

Metrics Dump

Profiler

HBBase Configuration

Startup Progress

Master ubuntu

Region Servers

Back Tools

Memory

Request

Statistics

Compactions

Replications

ServerName	Start time	Last contact	Version	Requests Per Second	Num. Regions
ubuntu1502011310505000A	Fri Mar 22 08:31:24 UTC 2024	0 s	2.5.8	0	2
Total:				0	2

Back Masters

ServerName	Port	Start Time
Total:0		

Tables

Local Tables

System Tables

Snapshots

Region Visualizer

Total: 0 requests/sec per Region Server

Table

Region Metrics

Region Compaction

localhost:5000/master/cluster

HEARSE

Home

Table Details

Procedures & Logs

HBCK Report

Operation Details

Process Metrics

Local Logs

Log Level

Debug Dump

Metrics Dump

Profiler

HBBase Configuration

Startup Progress

Software Attributes

Operations Details

HBBase uses some fixed-size ring buffers to maintain rolling window history of specific server-side operation details. This page list all operation details relative from these ring buffers.

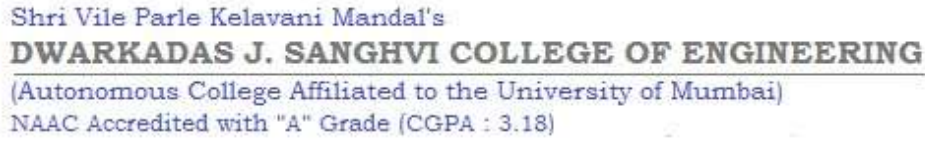
Select Region

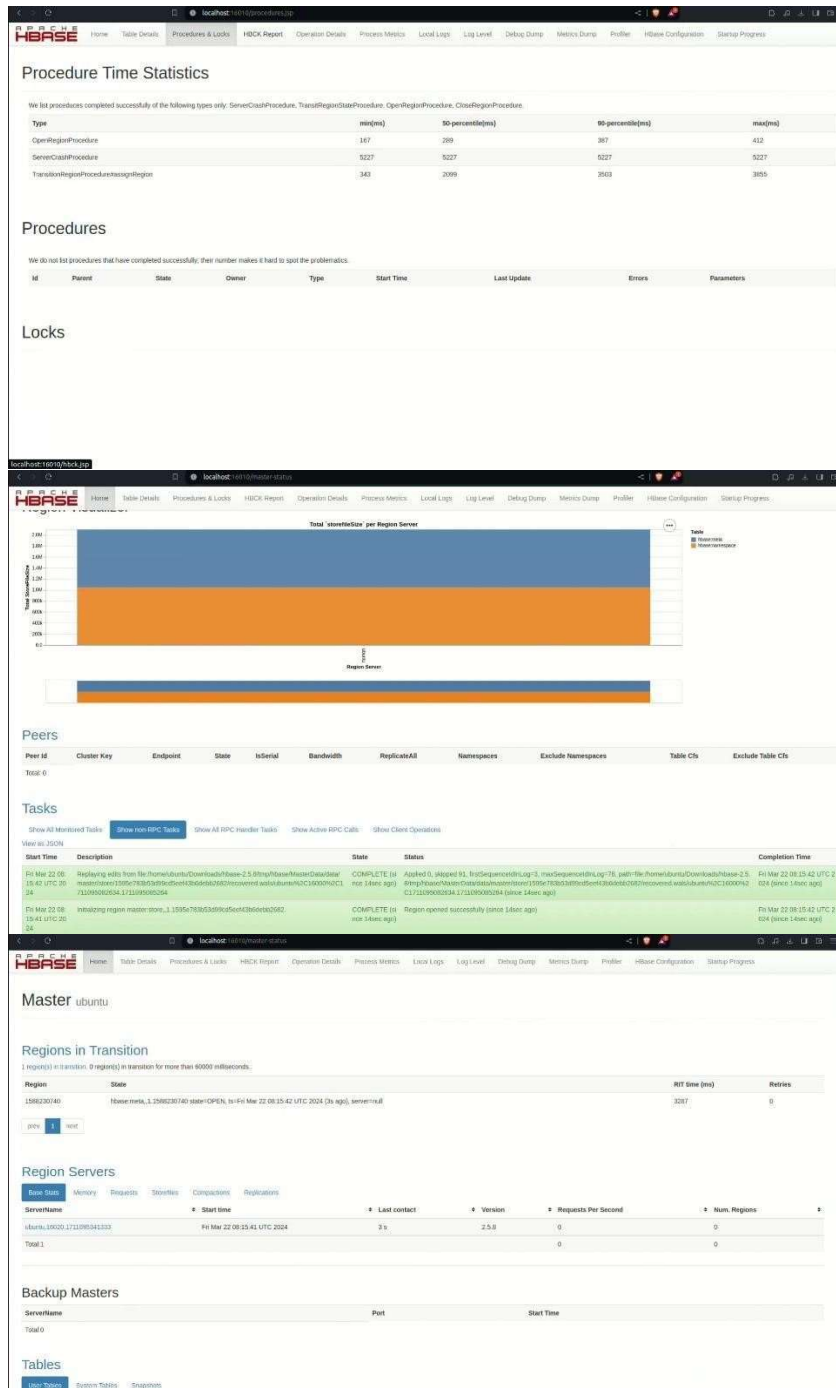
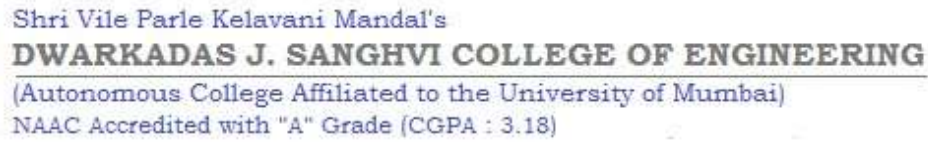
Balancer Decision

Balancer (Regular) explain why balancer is skipping ratio and explain all factors considered.

localhost:5000/ops

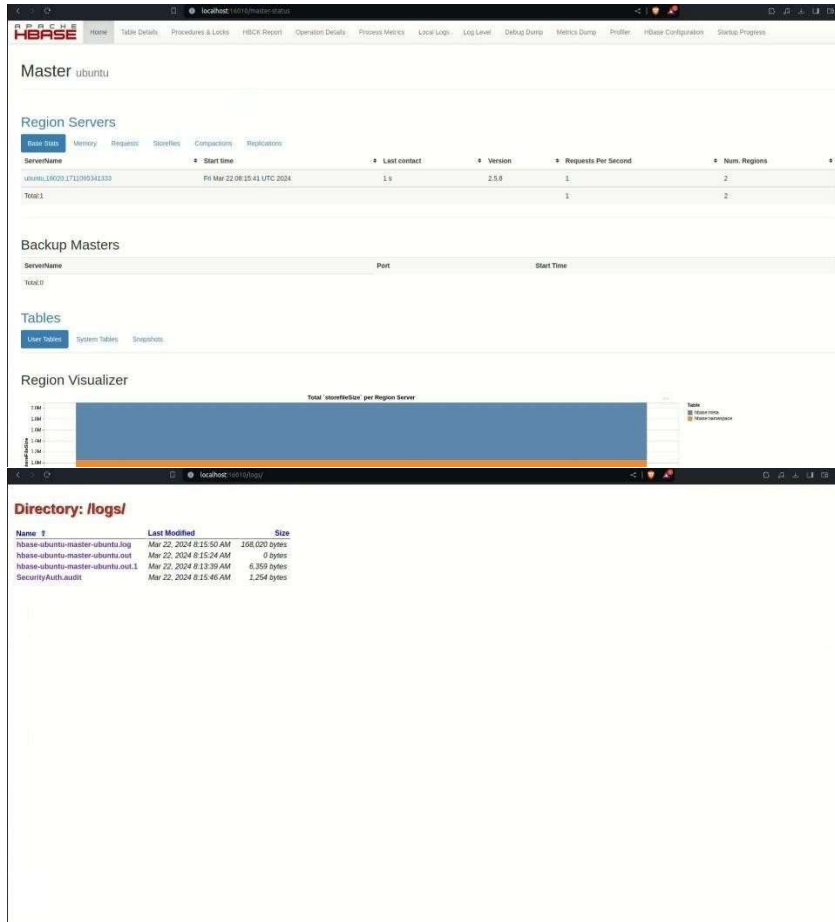


[illegible]



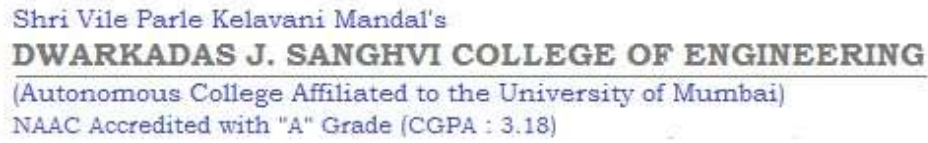


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2. Implementation of HBase Create Table with Java API & Shell.
3. Implement HBase Shell Commands and dynamic scaling:
  - a. General commands
  - b. Tables Managements commands
  - c. Data manipulation commands





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```

sh@ip-10-0-0-10:~/Documents/Hbase2.8.6$
Traceback (most recent call last):
SyntaxError (Hbase)File syntax error: unexpected string reg)
put 'test','cf:a','value1'
Hbase>092:0 put 'test','row1','cf:b','value1'
Took 0.8601 seconds
Hbase>010:0 put 'test','row2','cf:b','value2'
Took 0.8609 seconds
Hbase>011:0 put 'test','row3','cf:c','value3'
Took 0.8603 seconds
Hbase>012:0 scan 'test'
ROW
COLUMN=CFILL
column=cf:a, timestamp=2024-03-22T08:24:55.387, value=value1
column=cf:b, timestamp=2024-03-22T08:25:12.180, value=value2
column=cf:c, timestamp=2024-03-22T08:25:12.249, value=value3
3 row(s)
Took 0.8208 seconds
Hbase>013:0 get 'test','rows'
COLUMN
cf:a
1 row(s)
Took 0.8072 seconds
Hbase>014:0 disable 'test'
Took 0.3303 seconds
Hbase>015:0 quit
sh@ip-10-0-0-10:~/Documents$ ./bin/start-hbase.sh
water coming da process SS1697. Stop it first
sh@ip-10-0-0-10:~/Documents$ ./bin/hbase shell
Hbase Shell
Use "help" to get list of supported commands.
Use "exit" to quit this interactive shell.
For Reference, please visit: http://hbase.apache.org/2.8/book.htmlshell
Version 2.8.6, r17444ee6333bdad7e485cd3d02ebabaf919, Thu Feb 29 15:37:32 PST 2024
Hbase>000:0 create 'employee', 'cf'
Created table employee
Took 0.9302 seconds
=> Hbase>table -employee
Hbase>002:0 put 'employee', 'om', 'cf:id', '1'
Took 0.1046 seconds
Hbase>003:0 put 'employee', 'nhir', 'cf:id', '2'
Took 0.8006 seconds
Hbase>004:0 put 'employee', 'bhut', 'cf:id', '3'
Took 0.8005 seconds
Hbase>005:0 put 'employee', 'amuratha', 'cf:id', '4'
Took 0.8004 seconds
Hbase>006:0 put 'employee', 'vishna', 'cf:id', '5'
Took 0.8009 seconds
Hbase>007:0 put 'employee', 'yash', 'cf:id', '6'
Took 0.8004 seconds
Hbase>008:0 put 'employee', 'arpan', 'cf:id', '7'
Took 0.8077 seconds
Hbase>009:0

```



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```
ubuntu@ubuntu:~/Downloads/hbase-2.5.8
hbase:018:0> put 'employee', 'yash', 'cf:name', 'Yash'
Took 0.0103 seconds
hbase:019:0> put 'employee', 'aryan', 'cf:name', 'Aryan'
Took 0.0027 seconds
hbase:020:0> put 'employee', 'atharv', 'cf:name', 'Atharv'
Took 0.0034 seconds
hbase:021:0> put 'employee', 'krish', 'cf:name', 'Krish'
Took 0.0055 seconds
hbase:022:0> put 'employee', 'foran', 'cf:name', 'Foran'
Took 0.0027 seconds
hbase:023:0>
hbase:024:0> put 'employee', 'on', 'cf:salary', '50000'
Took 0.0051 seconds
hbase:025:0> put 'employee', 'mithr', 'cf:salary', '60000'
Took 0.0082 seconds
hbase:026:0> put 'employee', 'bhuvl', 'cf:salary', '55000'
Took 0.0050 seconds
hbase:027:0> put 'employee', 'anuradha', 'cf:salary', '70000'
Took 0.0047 seconds
hbase:028:0> put 'employee', 'vishna', 'cf:salary', '65000'
Took 0.0050 seconds
hbase:029:0> put 'employee', 'yash', 'cf:salary', '48000'
Took 0.0029 seconds
hbase:030:0> put 'employee', 'aryan', 'cf:salary', '52000'
Took 0.0025 seconds
hbase:031:0> put 'employee', 'atharv', 'cf:salary', '50000'
Took 0.0029 seconds
hbase:032:0> put 'employee', 'krish', 'cf:salary', '63000'
Took 0.0034 seconds
hbase:033:0> put 'employee', 'foran', 'cf:salary', '54000'
Took 0.0021 seconds
hbase:034:0>
hbase:035:0> put 'employee', 'on', 'cf:designation', 'Manager'
Took 0.0021 seconds
hbase:036:0> put 'employee', 'mithr', 'cf:designation', 'Developer'
Took 0.0020 seconds
hbase:037:0> put 'employee', 'bhuvl', 'cf:designation', 'Analyst'
Took 0.0019 seconds
hbase:038:0> put 'employee', 'anuradha', 'cf:designation', 'Designer'
Took 0.0024 seconds
hbase:039:0> put 'employee', 'vishna', 'cf:designation', 'Engineer'
Took 0.0021 seconds
hbase:040:0> put 'employee', 'yash', 'cf:designation', 'Consultant'
Took 0.0022 seconds
hbase:041:0> put 'employee', 'aryan', 'cf:designation', 'Team Lead'
Took 0.0035 seconds
hbase:042:0> put 'employee', 'atharv', 'cf:designation', 'HR'
Took 0.0024 seconds
hbase:043:0> put 'employee', 'krish', 'cf:designation', 'Tester'
Took 0.0022 seconds
hbase:044:0> put 'employee', 'foran', 'cf:designation', 'Architect'
Took 0.0037 seconds
hbase:045:0> scan 'employee'
ROW                                COLUMN+CELL
anuradha                           columncf:designation, timestamp=2024-03-22T08:44:13.938, value=Designer
anuradha                           columncf:name, timestamp=2024-03-22T08:44:13.573, value=Anuradha
anuradha                           columncf:salary, timestamp=2024-03-22T08:44:13.798, value=70000
anuradha                           columncf:designation, timestamp=2024-03-22T08:44:13.969, value=Team Lead
aryan                              columncf:id, timestamp=2024-03-22T08:44:13.331, value=7
aryan                              columncf:name, timestamp=2024-03-22T08:44:13.686, value=Aryan
aryan                              columncf:salary, timestamp=2024-03-22T08:44:13.844, value=52000
aryan                              columncf:designation, timestamp=2024-03-22T08:44:13.809, value=HR
atharv                             columncf:id, timestamp=2024-03-22T08:44:13.383, value=8
atharv                             columncf:name, timestamp=2024-03-22T08:44:13.698, value=Atharv
atharv                             columncf:salary, timestamp=2024-03-22T08:44:13.861, value=50000
atharv                             columncf:designation, timestamp=2024-03-22T08:44:13.926, value=Analyst
bhuvl                              columncf:id, timestamp=2024-03-22T08:44:13.217, value=3
bhuvl                              columncf:name, timestamp=2024-03-22T08:44:13.548, value=Bhuvl
bhuvl                              columncf:salary, timestamp=2024-03-22T08:44:13.781, value=55000
foran                              columncf:designation, timestamp=2024-03-22T08:44:14.081, value=Architect
foran                              columncf:id, timestamp=2024-03-22T08:44:13.447, value=10
foran                              columncf:name, timestamp=2024-03-22T08:44:13.720, value=Foran
foran                              columncf:salary, timestamp=2024-03-22T08:44:13.888, value=54000
krish                              columncf:designation, timestamp=2024-03-22T08:44:13.999, value=Tester
krish                              columncf:id, timestamp=2024-03-22T08:44:13.410, value=9
krish                              columncf:name, timestamp=2024-03-22T08:44:13.713, value=Krish
krish                              columncf:salary, timestamp=2024-03-22T08:44:13.875, value=63000
krish                              columncf:designation, timestamp=2024-03-22T08:44:13.937, value=Developer
mithr                             columncf:id, timestamp=2024-03-22T08:44:13.185, value=2
mithr                             columncf:name, timestamp=2024-03-22T08:44:13.510, value=Mithr
mithr                             columncf:salary, timestamp=2024-03-22T08:44:13.769, value=60000
on                                 columncf:designation, timestamp=2024-03-22T08:44:13.907, value=Manager
on                                 columncf:id, timestamp=2024-03-22T08:44:13.170, value=1
on                                 columncf:name, timestamp=2024-03-22T08:44:13.486, value=On
on                                 columncf:salary, timestamp=2024-03-22T08:44:13.749, value=50000
vishna                            columncf:designation, timestamp=2024-03-22T08:44:13.948, value=Engineer
vishna                            columncf:id, timestamp=2024-03-22T08:44:13.260, value=5
vishna                            columncf:name, timestamp=2024-03-22T08:44:13.632, value=Vishna
vishna                            columncf:salary, timestamp=2024-03-22T08:44:13.814, value=65000
yash                             columncf:designation, timestamp=2024-03-22T08:44:13.957, value=Consultant
yash                             columncf:id, timestamp=2024-03-22T08:44:13.287, value=6
yash                             columncf:name, timestamp=2024-03-22T08:44:13.656, value=Yash
yash                             columncf:salary, timestamp=2024-03-22T08:44:13.820, value=48000
10 row(s)
Took 0.1022 seconds
hbase:046:0>
```



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```
ubuntu@ubuntu: ~/Downloads/hbase-2.5.8
hbase:045:0> scan 'employee'
ROW
anuradha
anuradha
anuradha
anuradha
aryan
aryan
aryan
atharv
atharv
atharv
bhuvt
bhuvt
bhuvt
bhuvt
foran
foran
foran
foran
krish
krish
krish
krish
nthr
nthr
nthr
on
on
on
on
vishna
vishna
vishna
vishna
yash
yash
yash
yash
10 rows(s)
Took 0.1022 seconds
hbase:046:0> get 'employee', 'on'
COLUMN
cf:designation
cf:id
cf:name
cf:salary
1 row(s)
Took 0.0206 seconds
hbase:047:0>
COLUMN+CELL
column=cf:designation, timestamp=2024-03-22T08:44:13.938, value=Designer
column=cf:id, timestamp=2024-03-22T08:44:13.237, value=4
column=cf:name, timestamp=2024-03-22T08:44:13.272, value=Anuradha
column=cf:salary, timestamp=2024-03-22T08:44:13.798, value=70000
column=cf:designation, timestamp=2024-03-22T08:44:13.968, value=Team Lead
column=cf:id, timestamp=2024-03-22T08:44:13.331, value=7
column=cf:name, timestamp=2024-03-22T08:44:13.086, value=Aryan
column=cf:salary, timestamp=2024-03-22T08:44:13.844, value=52000
column=cf:designation, timestamp=2024-03-22T08:44:13.980, value=HR
column=cf:id, timestamp=2024-03-22T08:44:13.217, value=3
column=cf:name, timestamp=2024-03-22T08:44:13.098, value=Atharv
column=cf:salary, timestamp=2024-03-22T08:44:13.861, value=58000
column=cf:designation, timestamp=2024-03-22T08:44:13.926, value=Analyst
column=cf:id, timestamp=2024-03-22T08:44:13.217, value=3
column=cf:name, timestamp=2024-03-22T08:44:13.548, value=Bhuvt
column=cf:salary, timestamp=2024-03-22T08:44:13.781, value=55000
column=cf:designation, timestamp=2024-03-22T08:44:14.001, value=Architect
column=cf:id, timestamp=2024-03-22T08:44:13.447, value=10
column=cf:name, timestamp=2024-03-22T08:44:13.726, value=Foran
column=cf:salary, timestamp=2024-03-22T08:44:13.888, value=54000
column=cf:designation, timestamp=2024-03-22T08:44:13.990, value=Tester
column=cf:id, timestamp=2024-03-22T08:44:13.430, value=9
column=cf:name, timestamp=2024-03-22T08:44:13.713, value=Krish
column=cf:salary, timestamp=2024-03-22T08:44:13.875, value=63000
column=cf:designation, timestamp=2024-03-22T08:44:13.917, value=Developer
column=cf:id, timestamp=2024-03-22T08:44:13.185, value=2
column=cf:name, timestamp=2024-03-22T08:44:13.510, value=Mthtr
column=cf:salary, timestamp=2024-03-22T08:44:13.769, value=60000
column=cf:designation, timestamp=2024-03-22T08:44:13.987, value=Manager
column=cf:id, timestamp=2024-03-22T08:44:13.170, value=1
column=cf:name, timestamp=2024-03-22T08:44:13.486, value=On
column=cf:salary, timestamp=2024-03-22T08:44:13.749, value=50000
column=cf:designation, timestamp=2024-03-22T08:44:13.948, value=Engineer
column=cf:id, timestamp=2024-03-22T08:44:13.266, value=5
column=cf:name, timestamp=2024-03-22T08:44:13.632, value=Vishna
column=cf:salary, timestamp=2024-03-22T08:44:13.814, value=65000
column=cf:designation, timestamp=2024-03-22T08:44:13.957, value=Consultant
column=cf:id, timestamp=2024-03-22T08:44:13.287, value=6
column=cf:name, timestamp=2024-03-22T08:44:13.656, value=Yash
column=cf:salary, timestamp=2024-03-22T08:44:13.828, value=48000
CELL
timestamp=2024-03-22T08:44:13.907, value=Manager
timestamp=2024-03-22T08:44:13.170, value=1
timestamp=2024-03-22T08:44:13.486, value=On
timestamp=2024-03-22T08:44:13.749, value=50000
hbase:047:0> disable 'employee'
Took 0.3387 seconds
hbase:048:0> drop 'employee'
Took 0.3352 seconds
```



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```
ubuntu@ubuntu: ~/Downloads/hbase-2.5.8
HBase Shell
Use "help" to get list of supported commands.
Use "exit" to quit this interactive shell.
For Reference, please visit: https://hbase.apache.org/2.0/book.html#shell
Version 2.5.8, r37444de0531b1dbdf2e445c83d0268ab1a0f919, Thu Feb 29 15:37:32 PST 2024
Took 0.0010 seconds
hbase:001:0> status
1 active master, 0 backup masters, 1 servers, 0 dead, 2.0000 average load
Took 0.3099 seconds
hbase:002:0> version
2.5.8, r37444de0531b1dbdf2e445c83d0268ab1a0f919, Thu Feb 29 15:37:32 PST 2024
Took 0.0002 seconds
hbase:003:0> table_help
Help for table-reference commands.

You can either create a table via 'create' and then manipulate the table via commands like 'put', 'get', etc.
See the standard help information for how to use each of these commands.

However, as of 0.96, you can also get a reference to a table, on which you can invoke commands.
For instance, you can get create a table and keep around a reference to it via:

hbase> t = create 't', 'cf'

Or, if you have already created the table, you can get a reference to it:

hbase> t = get_table 't'

You can do things like call 'put' on the table:

hbase> t.put 'r', 'cf:q', 'v'

which puts a row 'r' with column family 'cf', qualifier 'q' and value 'v' into table t.

To read the data out, you can scan the table:

hbase> t.scan

which will read all the rows in table 't'.

Essentially, any command that takes a table name can also be done via table reference.
Other commands include things like: get, delete, deleteall,
get_all_columns, get_counter, count, incr. These functions, along with
the standard JRuby object methods are also available via tab completion.

For more information on how to use each of these commands, you can also just type:

hbase> t.help 'scan'

which will output more information on how to use that command.

You can also do general admin actions directly on a table; things like enable, disable,
flush and drop just by typing:

hbase> t.enable
hbase> t.flush
hbase> t.disable
hbase> t.drop

Note that after dropping a table, your reference to it becomes useless and further usage
is undefined (and not recommended).
Took 0.0003 seconds
hbase:004:0> whoami
ubuntu (auth:SIMPLE)
groups: ubuntu, adm, cdrom, sudo, dip, plugdev, kvm, lpadmin, lxd, sambashare
Took 0.0259 seconds
hbase:005:0>
```





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```
ubuntu@ubuntu: ~/Downloads/hbase-2.5.8
HBase Shell
Use "help" to get list of supported commands.
Use "exit" to quit this interactive shell.
For Reference, please visit: https://hbase.apache.org/2.0/book.html#shell
Version 2.5.8, r37444de6531b1dbabf2e445c83d0268ab1a0f919, Thu Feb 29 15:37:32 PST 2024
Took 0.0009 seconds
hbase:001:0> create 'employee', {NAME => 'id'}, {NAME => 'name'}, {NAME => 'salary'}, {NAME => 'designation'}
Created table employee
Took 0.8801 seconds
=> Hbase::Table - employee
hbase:002:0>

hbase:023:0> put 'employee', 'row5', 'name', 'vishna'
Took 0.0022 seconds
hbase:024:0> put 'employee', 'row5', 'salary', '11000'
Took 0.0021 seconds
hbase:025:0> put 'employee', 'row5', 'designation', 'Analyst'
Took 0.0019 seconds
hbase:026:0> put 'employee', 'row6', 'id', '6'
Took 0.0020 seconds
hbase:028:0> put 'employee', 'row6', 'name', 'yash'
Took 0.0022 seconds
hbase:029:0> put 'employee', 'row6', 'salary', '13000'
Took 0.0020 seconds
hbase:030:0> put 'employee', 'row6', 'designation', 'Engineer'
Took 0.0082 seconds
hbase:031:0> put 'employee', 'row7', 'id', '7'
Took 0.0023 seconds
hbase:033:0> put 'employee', 'row7', 'name', 'aryan'
Took 0.0031 seconds
hbase:034:0> put 'employee', 'row7', 'salary', '9000'
Took 0.0039 seconds
hbase:035:0> put 'employee', 'row7', 'designation', 'Assistant'
Took 0.0024 seconds
hbase:036:0> put 'employee', 'row8', 'id', '8'
Took 0.0027 seconds
hbase:038:0> put 'employee', 'row8', 'name', 'atharv'
Took 0.0018 seconds
hbase:039:0> put 'employee', 'row8', 'salary', '14000'
Took 0.0017 seconds
hbase:040:0> put 'employee', 'row8', 'designation', 'Manager'
Took 0.0027 seconds
hbase:041:0> put 'employee', 'row9', 'id', '9'
Took 0.0018 seconds
hbase:043:0> put 'employee', 'row9', 'name', 'krish'
Took 0.0019 seconds
hbase:044:0> put 'employee', 'row9', 'salary', '10000'
Took 0.0029 seconds
hbase:045:0> put 'employee', 'row9', 'designation', 'Analyst'
Took 0.0022 seconds
hbase:046:0> put 'employee', 'row10', 'id', '10'
Took 0.0026 seconds
hbase:048:0> put 'employee', 'row10', 'name', 'foran'
Took 0.0019 seconds
hbase:049:0> put 'employee', 'row10', 'salary', '12000'
Took 0.0018 seconds
hbase:050:0> put 'employee', 'row10', 'designation', 'Engineer'
Took 0.0019 seconds
hbase:051:0> list
TABLE
employee
test
2 row(s)
Took 0.0081 seconds
=> ['employee', 'test']
hbase:052:0> describe 'employee'
Table employee is ENABLED
employee, {TABLE_ATTRIBUTES => {METADATA => {'hbase.store.file.tracker.unpl' => 'DEFAULT'}}}
COLUMN FAMILIES DESCRIPTION
(NAME => 'designation', INDEX_BLOCK_ENCODING => 'NONE', VERSIONS => '1', KEEP_DELETED_CELLS => 'FALSE', DATA_BLOCK_ENCODING => 'NONE', TTL => 'FOREVER', MIN_VERSIONS => '0', REPLICATION_SCOPE => '0', BLOOMFILTER => 'ROW', IN_MEMORY => 'false', COMPRESSION => 'NONE', BLOCKCACHE => 'true', BLOCKSIZE => '65536 B (64KB)')
(NAME => 'id', INDEX_BLOCK_ENCODING => 'NONE', VERSIONS => '1', KEEP_DELETED_CELLS => 'FALSE', DATA_BLOCK_ENCODING => 'NONE', TTL => 'FOREVER', MIN_VERSIONS => '0', REPLICATION_SCOPE => '0', BLOOMFILTER => 'ROW', IN_MEMORY => 'false', COMPRESSION => 'NONE', BLOCKCACHE => 'true', BLOCKSIZE => '65536 B (64KB)')
(NAME => 'name', INDEX_BLOCK_ENCODING => 'NONE', VERSIONS => '1', KEEP_DELETED_CELLS => 'FALSE', DATA_BLOCK_ENCODING => 'NONE', TTL => 'FOREVER', MIN_VERSIONS => '0', REPLICATION_SCOPE => '0', BLOOMFILTER => 'ROW', IN_MEMORY => 'false', COMPRESSION => 'NONE', BLOCKCACHE => 'true', BLOCKSIZE => '65536 B (64KB)')
(NAME => 'salary', INDEX_BLOCK_ENCODING => 'NONE', VERSIONS => '1', KEEP_DELETED_CELLS => 'FALSE', DATA_BLOCK_ENCODING => 'NONE', TTL => 'FOREVER', MIN_VERSIONS => '0', REPLICATION_SCOPE => '0', BLOOMFILTER => 'ROW', IN_MEMORY => 'false', COMPRESSION => 'NONE', BLOCKCACHE => 'true', BLOCKSIZE => '65536 B (64KB)')
4 row(s)
Quota is disabled
Took 0.0510 seconds
hbase:053:0>
```





## Department of Computer Science and Engineering (Data Science)

```
hbase:053:0> disable 'employee'
Took 0.3194 seconds
hbase:054:0> enable 'employee'
Took 0.6280 seconds
hbase:055:0> drop 'employee'

ERROR: Table employee is enabled. Disable it first.

For usage try 'help "drop"'

Took 0.0129 seconds
hbase:056:0> disable 'employee'
Took 0.3124 seconds
hbase:057:0> 
hbase:057:0> drop 'employee'
Took 0.1184 seconds
hbase:058:0> list
TABLE
test
1 row(s)
Took 0.0030 seconds
=> ['test']
hbase:059:0> 

ubuntu@ubuntu: ~/Downloads/hbase-2.5.8
ubuntu@ubuntu: ~/Downloads/hbase-2.5.8
ubuntu@ubuntu: ~/Downloads/hbase-2.5.8$ ./bin/hbase shell
HBase Shell
Use 'help' to get list of supported commands.
Use 'exit' to quit this interactive shell.
For Reference, please visit: http://hbase.apache.org/2.0/book.html#shell
Version 2.5.8, r37444de0531b1dbdbf2e445c3d0208ab1a0f919, Thu Feb 29 15:37:32 PST 2024
Took 0.0014 seconds
hbase:001:0> get 'employees', '1'
COLUMN                                CELL
personal_info:id                       timestamp=2024-03-22T09:16:25.428, value=1
personal_info:name                     timestamp=2024-03-22T09:16:25.437, value=on
personal_info:salary                   timestamp=2024-03-22T09:16:25.447, value=10000
professional_info:designation           timestamp=2024-03-22T09:16:25.455, value=Manager
1 row(s)
Took 0.3212 seconds
hbase:002:0> get 'employees', '1', (COLUMN => 'personal_info:name')
COLUMN                                CELL
personal_info:name                     timestamp=2024-03-22T09:16:25.437, value=on
1 row(s)
Took 0.0042 seconds
hbase:003:0> scan 'employees'
ROW                                     COLUMN+CELL
1                                       column=personal_info:id, timestamp=2024-03-22T09:16:25.428, value=1
1                                       column=personal_info:name, timestamp=2024-03-22T09:16:25.437, value=on
1                                       column=personal_info:salary, timestamp=2024-03-22T09:16:25.447, value=10000
1                                       column=professional_info:designation, timestamp=2024-03-22T09:16:25.455, value=Manager
10                                      column=personal_info:id, timestamp=2024-03-22T09:16:25.732, value=10
10                                      column=personal_info:name, timestamp=2024-03-22T09:16:25.739, value=foran
10                                      column=personal_info:salary, timestamp=2024-03-22T09:16:25.746, value=12000
10                                      column=professional_info:designation, timestamp=2024-03-22T09:16:25.753, value=Engineer
2                                       column=personal_info:id, timestamp=2024-03-22T09:16:25.467, value=2
2                                       column=personal_info:name, timestamp=2024-03-22T09:16:25.476, value=nhir
2                                       column=personal_info:salary, timestamp=2024-03-22T09:16:25.484, value=12000
2                                       column=professional_info:designation, timestamp=2024-03-22T09:16:25.492, value=Engineer
3                                       column=personal_info:id, timestamp=2024-03-22T09:16:25.504, value=3
3                                       column=personal_info:name, timestamp=2024-03-22T09:16:25.512, value=bhuvi
3                                       column=personal_info:salary, timestamp=2024-03-22T09:16:25.520, value=8000
3                                       column=professional_info:designation, timestamp=2024-03-22T09:16:25.528, value=Assistant
4                                       column=personal_info:id, timestamp=2024-03-22T09:16:25.540, value=4
4                                       column=personal_info:name, timestamp=2024-03-22T09:16:25.547, value=anuradha
4                                       column=personal_info:salary, timestamp=2024-03-22T09:16:25.555, value=15000
5                                       column=personal_info:id, timestamp=2024-03-22T09:16:25.580, value=vishna
5                                       column=personal_info:salary, timestamp=2024-03-22T09:16:25.587, value=11000
6                                       column=personal_info:id, timestamp=2024-03-22T09:16:25.611, value=yash
6                                       column=personal_info:salary, timestamp=2024-03-22T09:16:25.618, value=13000
7                                       column=personal_info:id, timestamp=2024-03-22T09:16:25.645, value=aryan
7                                       column=personal_info:salary, timestamp=2024-03-22T09:16:25.652, value=9000
8                                       column=personal_info:id, timestamp=2024-03-22T09:16:25.676, value=atharv
8                                       column=personal_info:salary, timestamp=2024-03-22T09:16:25.683, value=14000
9                                       column=personal_info:id, timestamp=2024-03-22T09:16:25.707, value=krish
9                                       column=personal_info:salary, timestamp=2024-03-22T09:16:25.714, value=10000
10 row(s)
Took 0.0668 seconds
hbase:005:0>
hbase:005:0> deleteall 'employees', '1'
Took 0.0278 seconds
hbase:006:0> delete 'employees', '1', 'personal_info:name'
Took 0.0027 seconds
hbase:007:0>
```