

Praktikum Teknologi Perencanaan Data

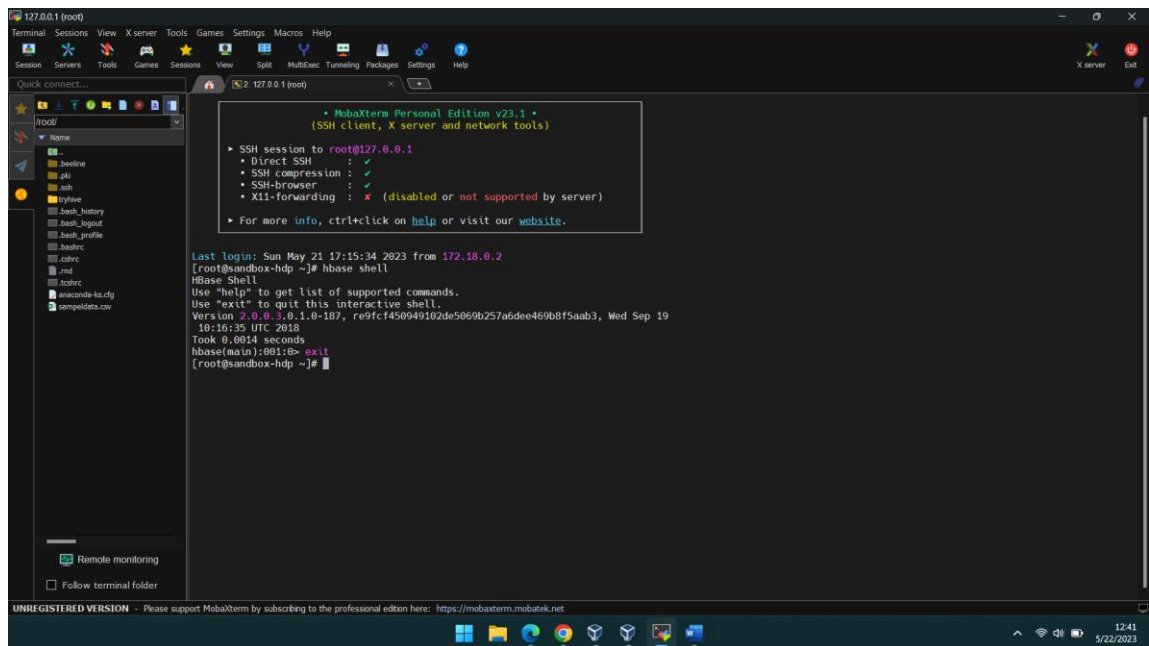
Tanggal Praktikum : Monday, May 22, 2023

Kelola Data dalam HBase

1. Masuk ke HBase shell

hbase shell

exit

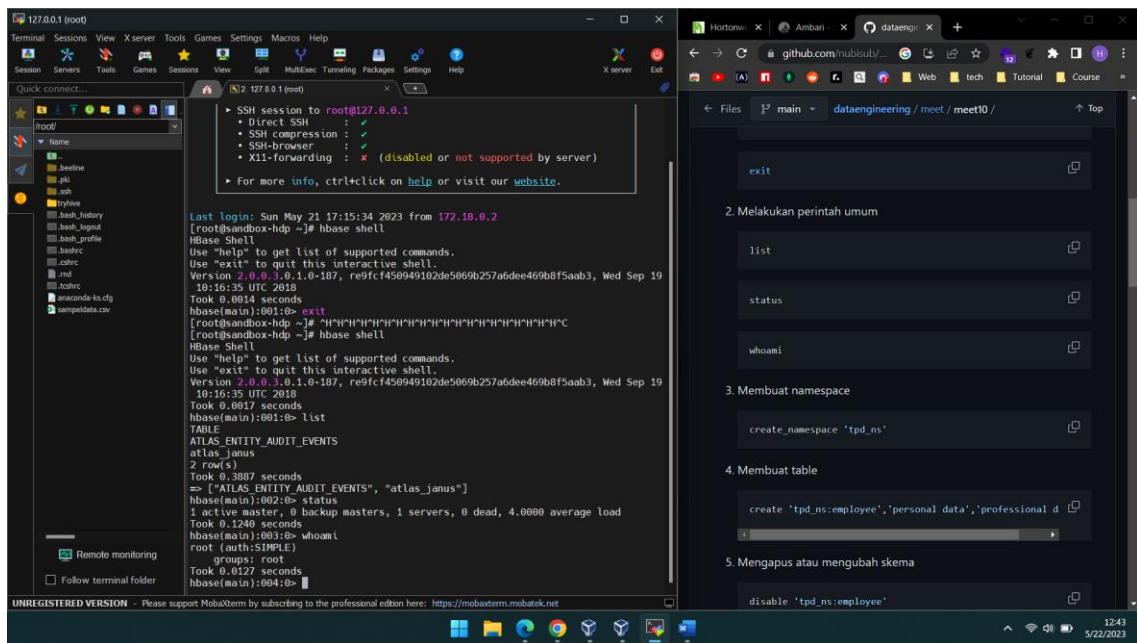


2. Melakukan perintah umum

list

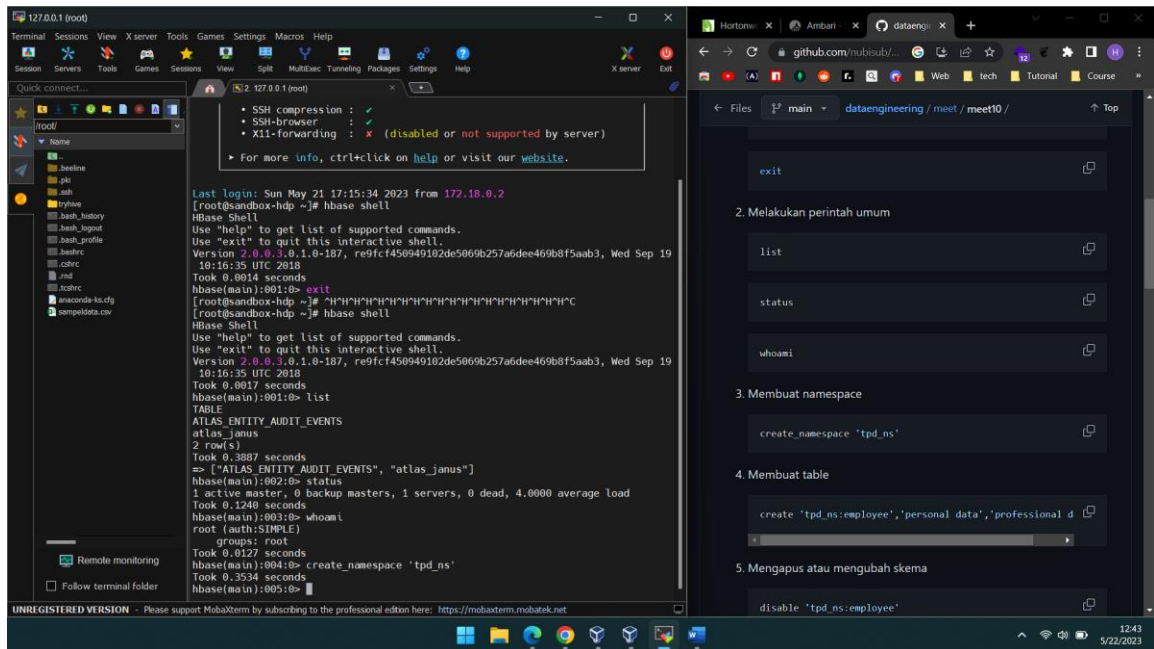
status

whoami



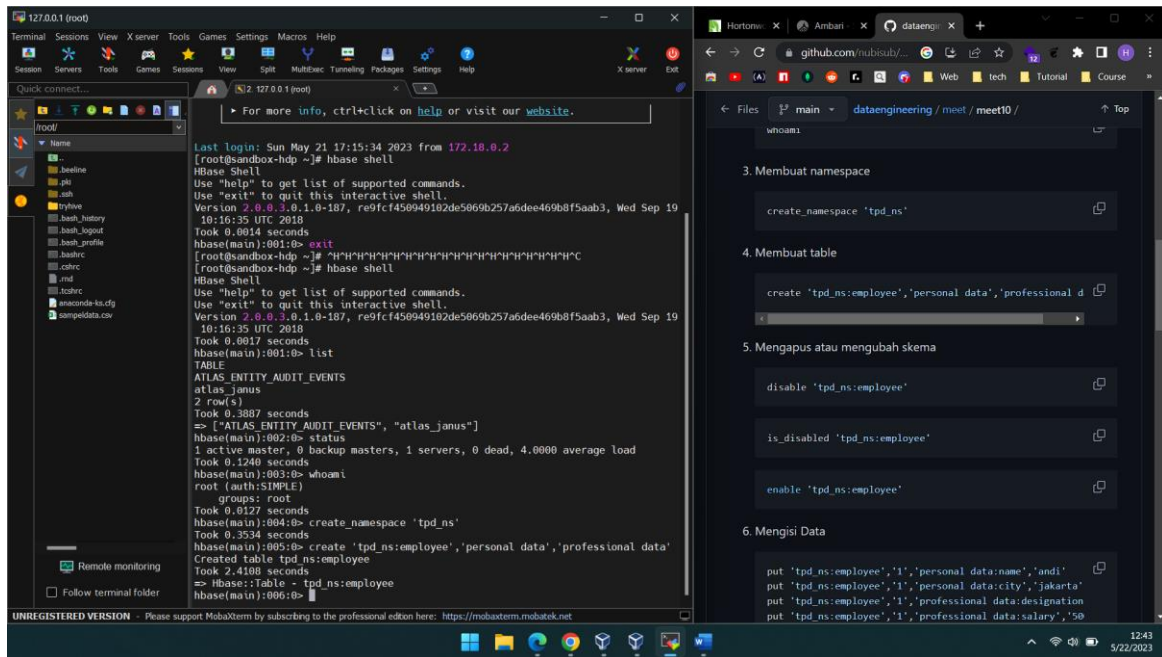
3. Membuat namespace

`create_namespace 'tpd_ns'`



4. Membuat table

`create 'tpd_ns:employee','personal data','professional data'`

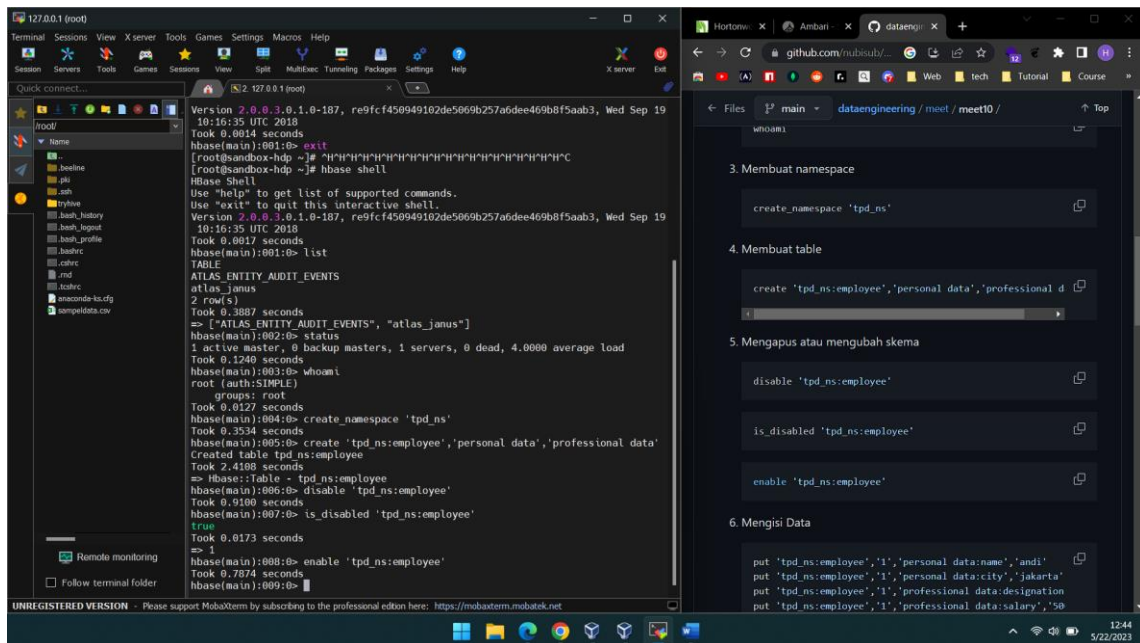


5. Mengapus atau mengubah skema

disable 'tpd_ns:employee'

is_disabled 'tpd_ns:employee'

enable 'tpd_ns:employee'

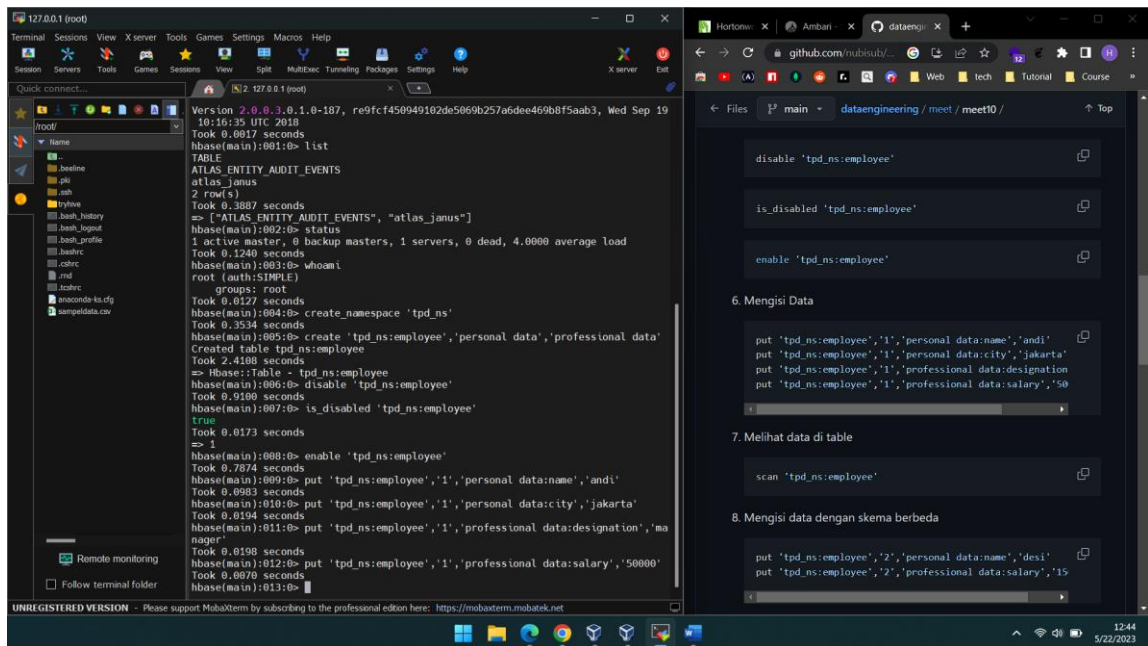


6. Mengisi Data

7. put 'tpd_ns:employee', '1', 'personal data:name', 'andi'

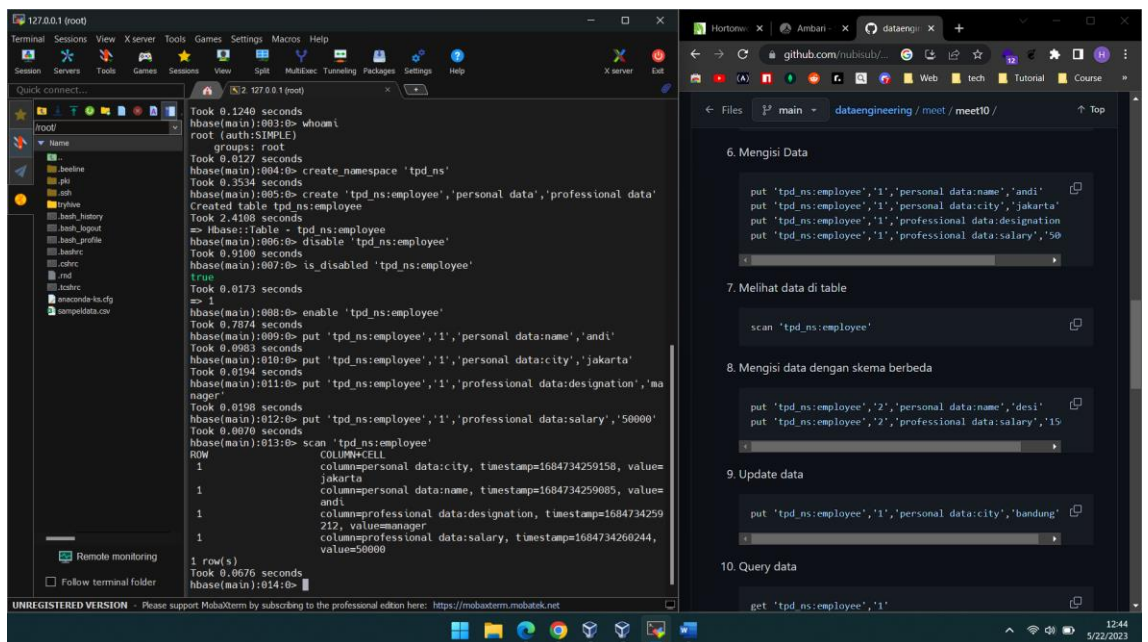
8. put 'tpd_ns:employee', '1', 'personal data:city', 'jakarta'

9. put 'tpd_ns:employee','1','professional data:designation','manager'
put 'tpd_ns:employee','1','professional data:salary','50000'



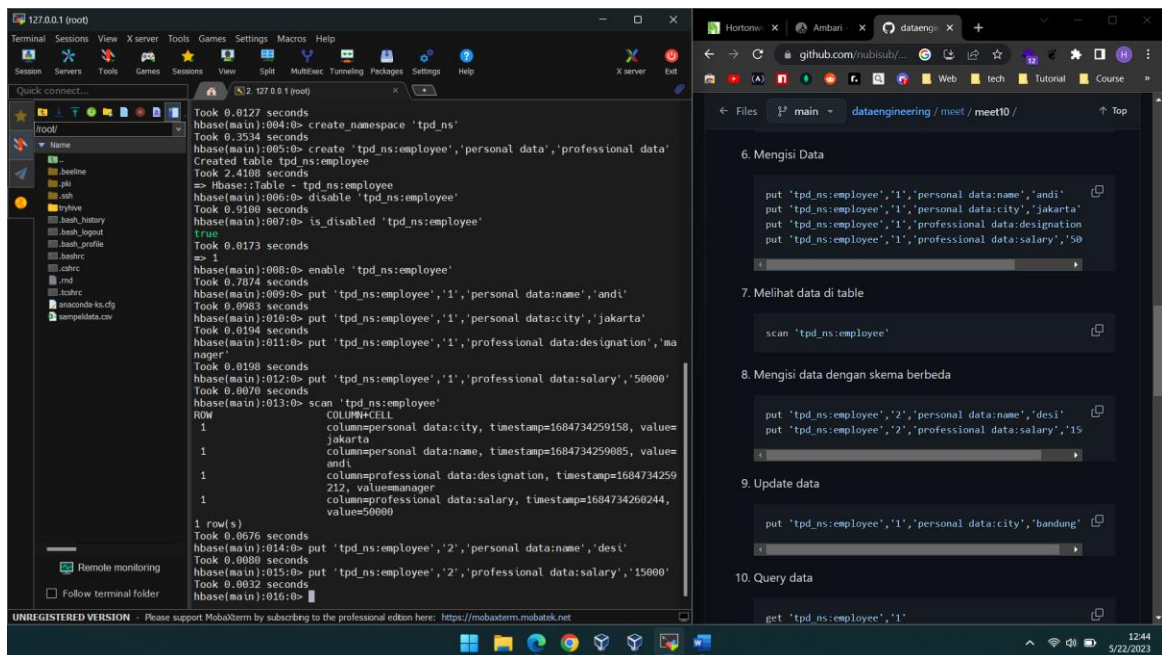
10. Melihat data di table

scan 'tpd_ns:employee'



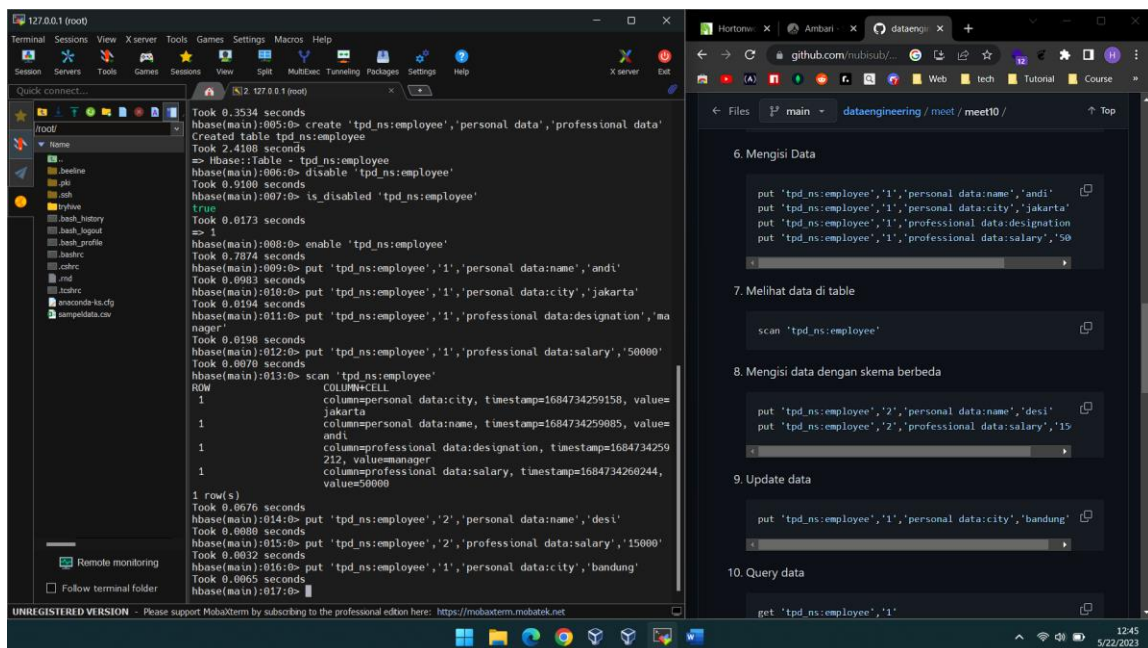
11. Mengisi data dengan skema berbeda

12. put 'tpd_ns:employee','2','personal data:name','desi'
put 'tpd_ns:employee','2','professional data:salary','15000'



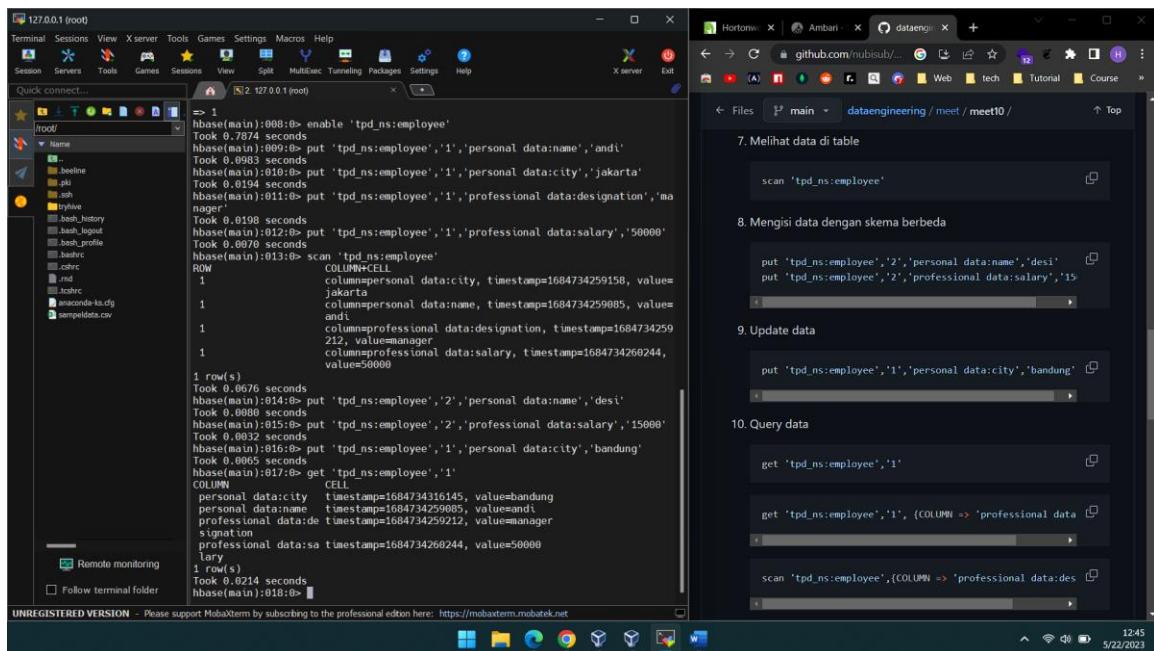
13. Update data

put 'tpd_ns:employee','1','personal data:city','bandung'

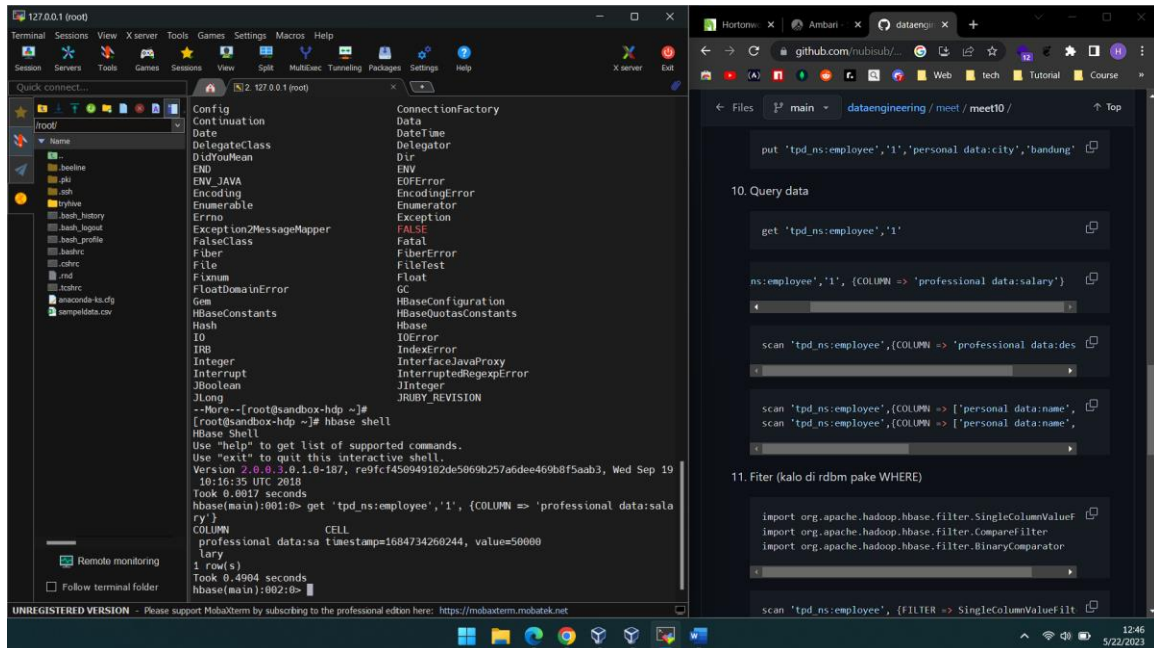


14. Query data

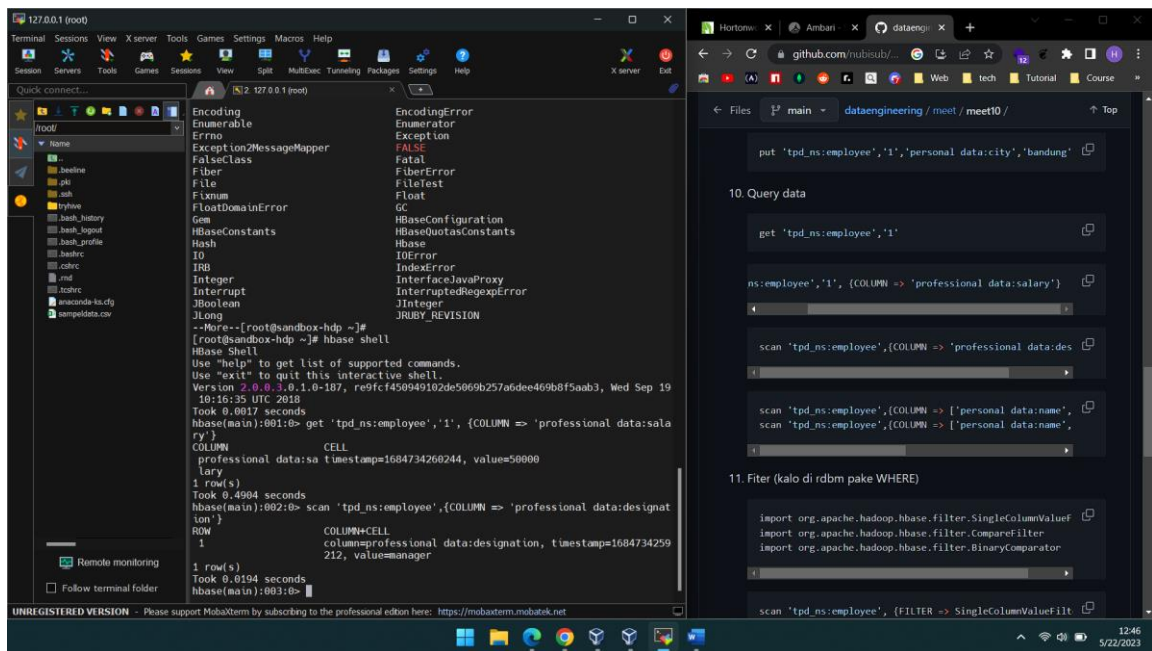
get 'tpd_ns:employee','1'



get 'tpd_ns:employee','1', {COLUMN => 'professional data:salary'}

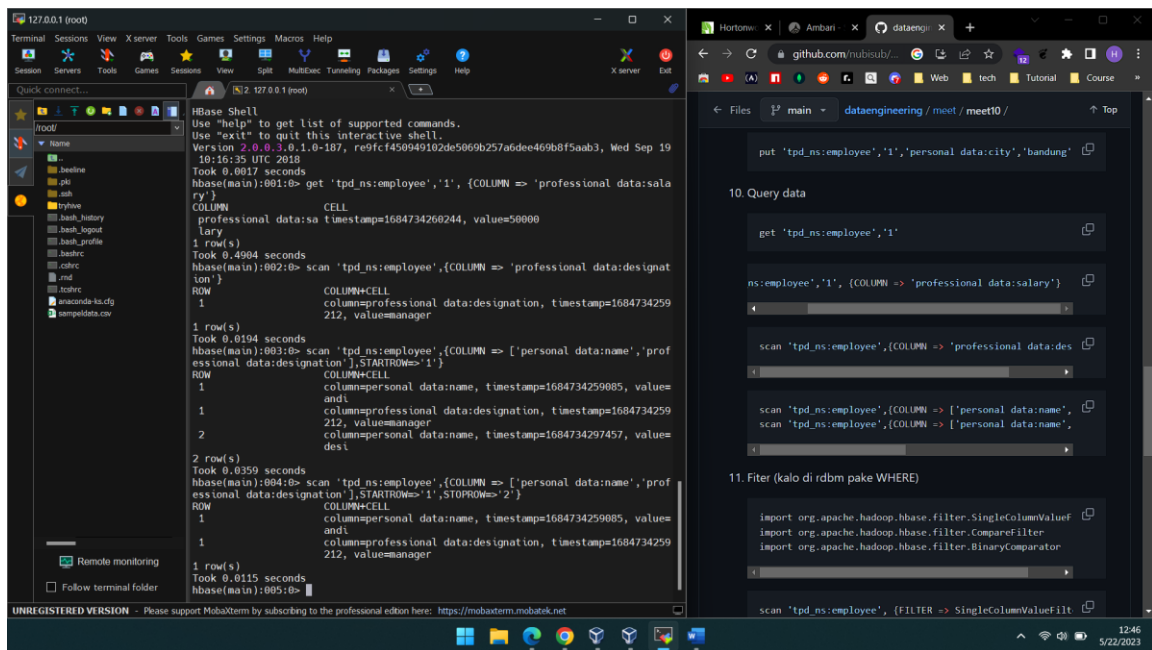


scan 'tpd_ns:employee',{COLUMN => 'professional data:designation'}



scan 'tpd_ns:employee',{COLUMN => ['personal data:name','professional data:designation'],STARTROW=>'1'}

scan 'tpd_ns:employee',{COLUMN => ['personal data:name','professional data:designation'],STARTROW=>'1',STOPROW=>'2'}

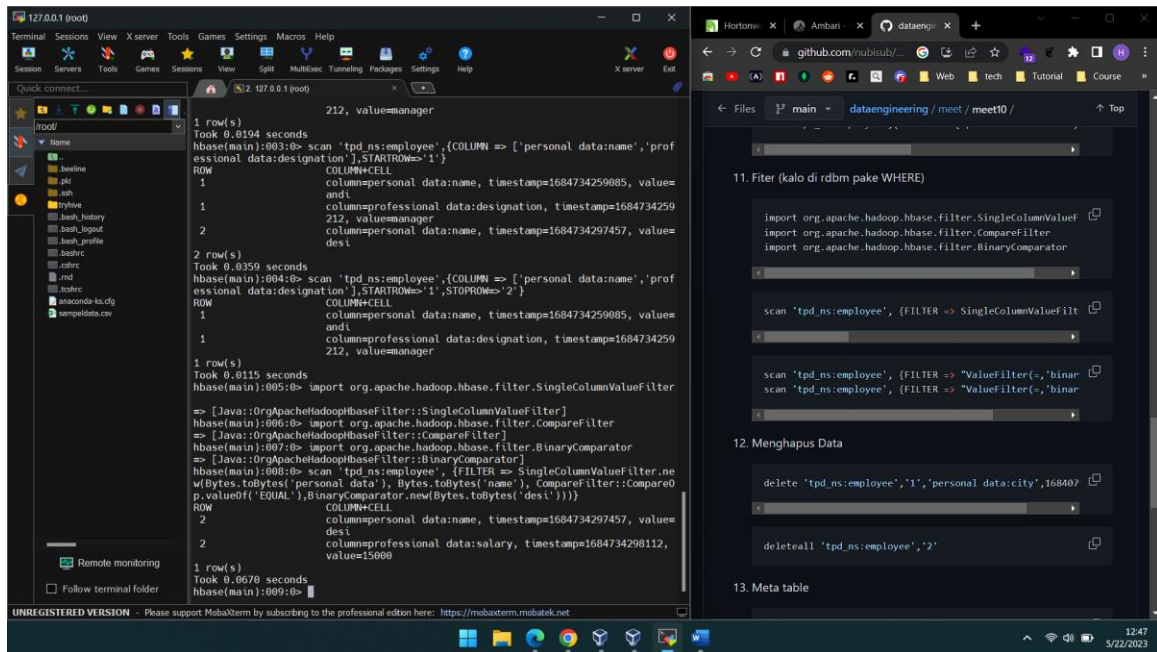


15. Fiter (kalo di rdbm pake WHERE)

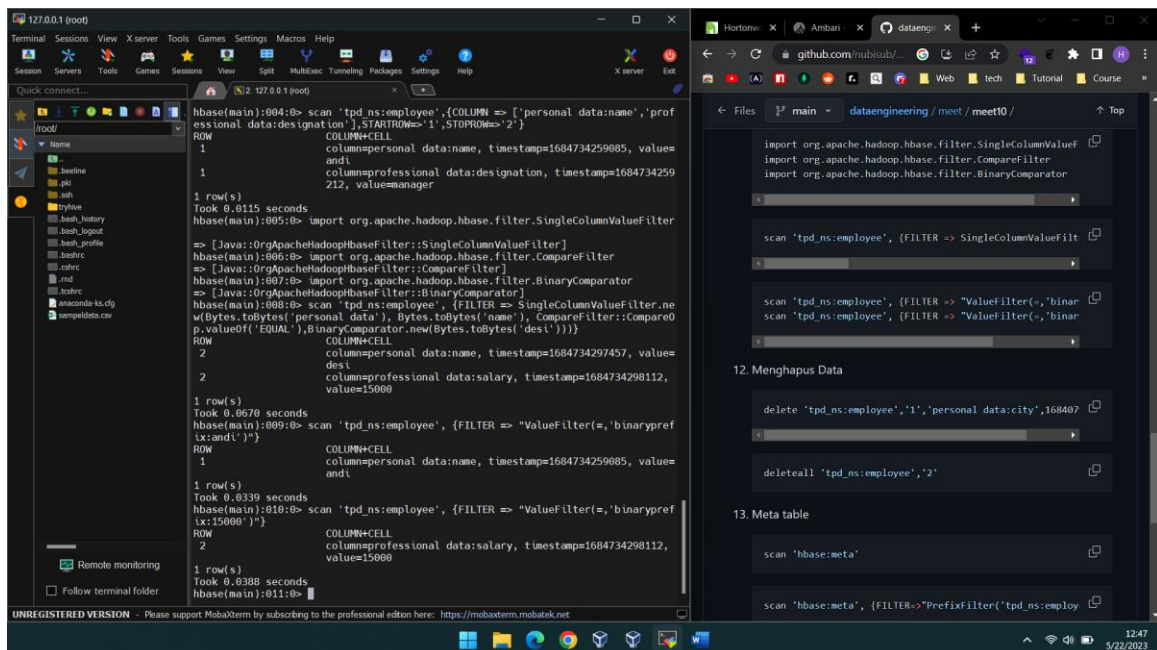
16. import org.apache.hadoop.hbase.filter.SingleColumnValueFilter

17. import org.apache.hadoop.hbase.filter.CompareFilter
import org.apache.hadoop.hbase.filter.BinaryComparator


```
scan 'tpd_ns:employee', {FILTER => SingleColumnValueFilter.new(Bytes.toBytes('personal data'),
Bytes.toBytes('name'),
CompareFilter::CompareOp.valueOf('EQUAL'), BinaryComparator.new(Bytes.toBytes('desi')))}
```

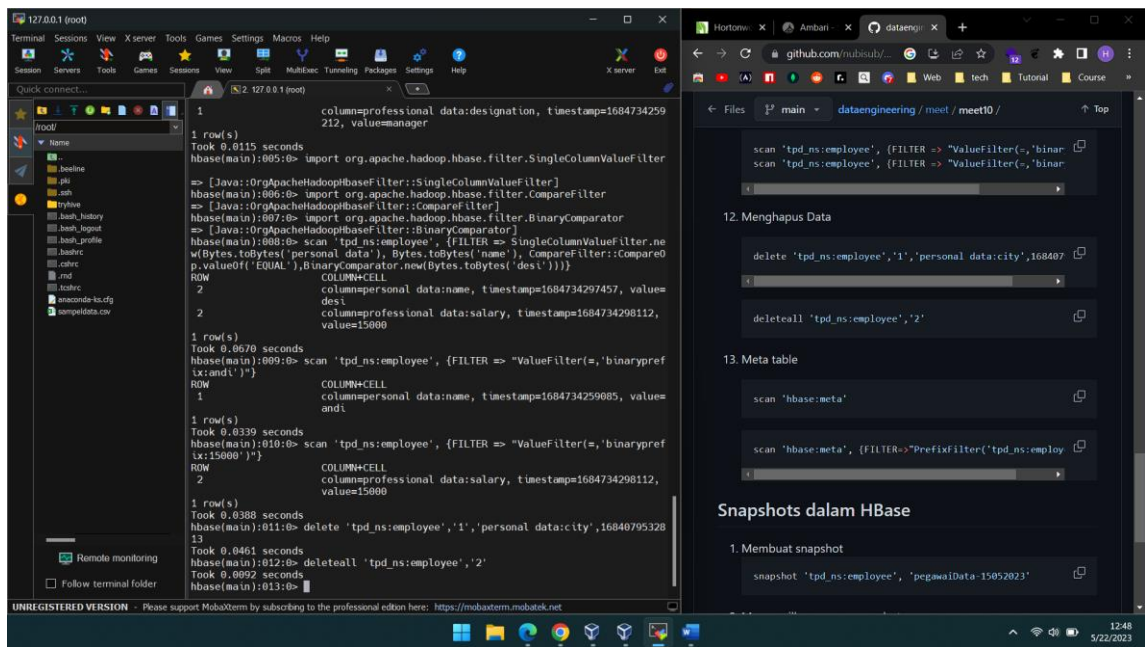


```
scan 'tpd_ns:employee', {FILTER => "ValueFilter(=, 'binaryprefix:and1')"}
scan 'tpd_ns:employee', {FILTER => "ValueFilter(=, 'binaryprefix:15000')"}
delete 'tpd_ns:employee', '1', 'personal data:city', '168407532813'
deleteall 'tpd_ns:employee', '2'
```



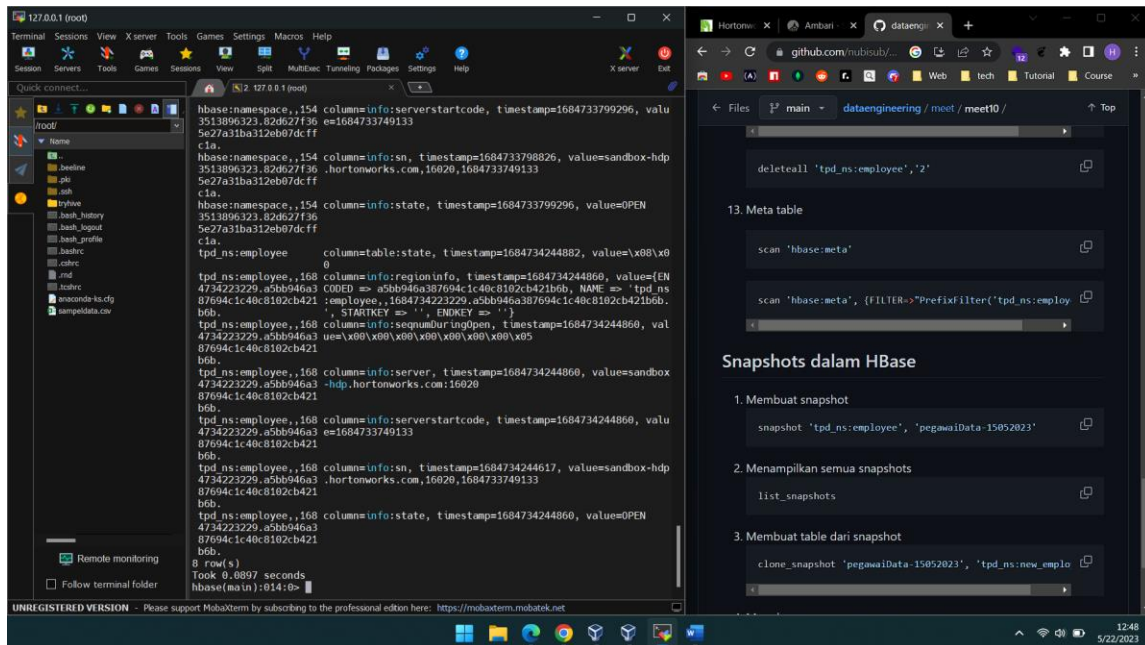
18. Menghapus Data

```
delete 'tpd_ns:employee', '1', 'personal data:city', '168407532813'
deleteall 'tpd_ns:employee', '2'
```

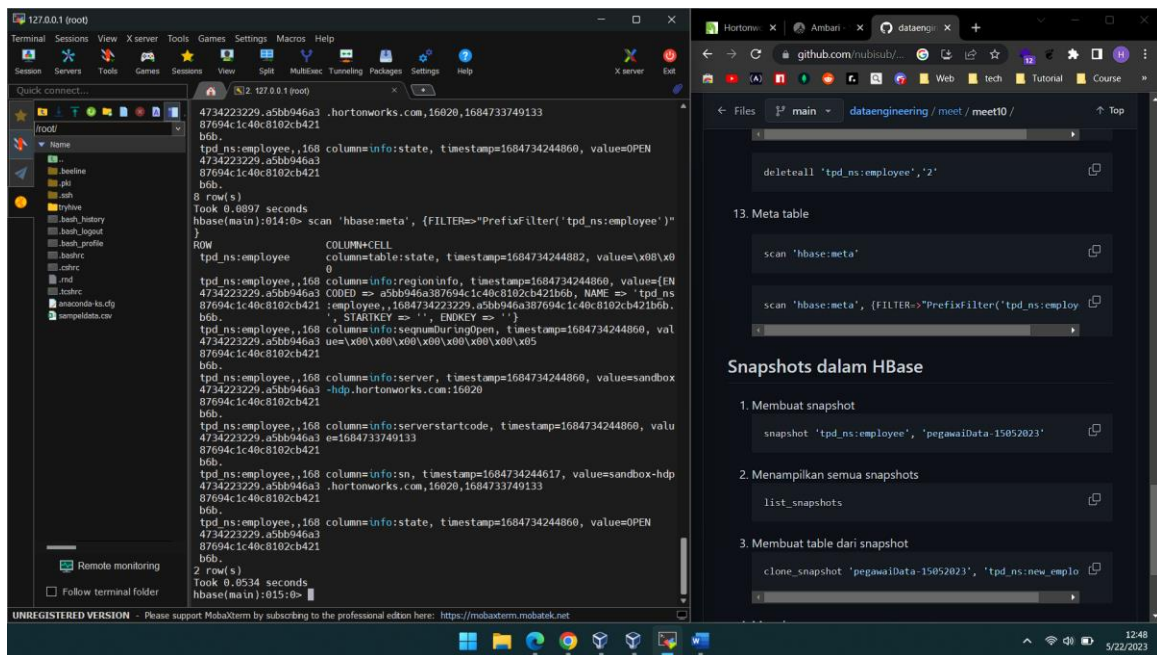



19. Meta table

scan 'hbase:meta'



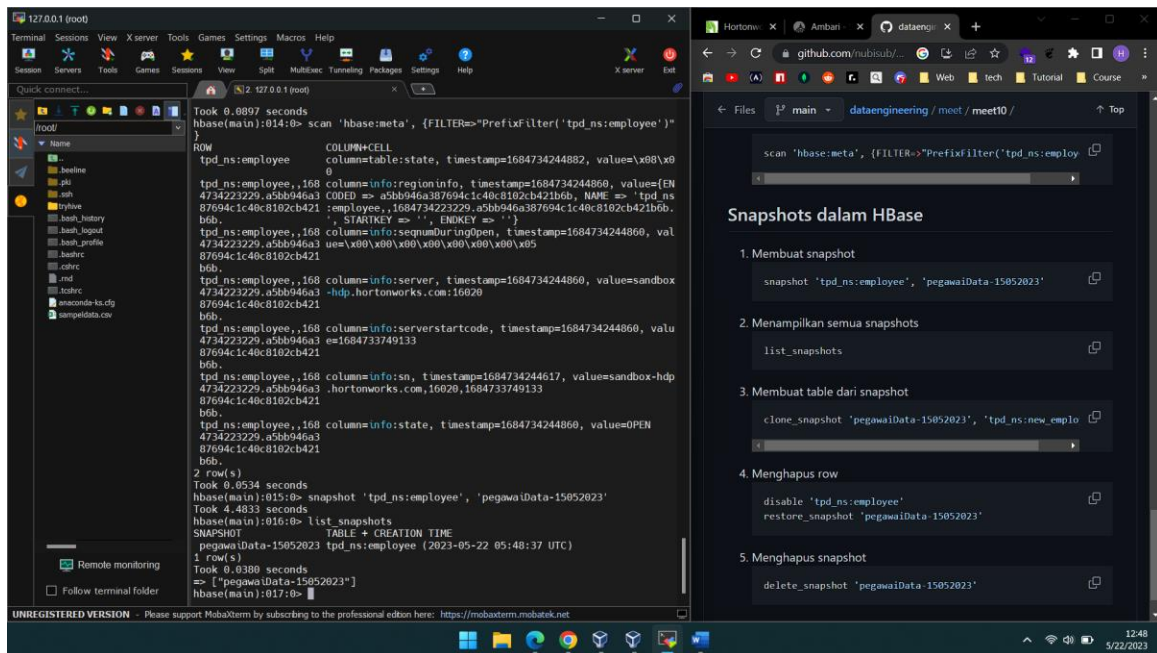
scan 'hbase:meta', {FILTER=>"PrefixFilter('tpd_ns:employee')"}\}



Snapshots dalam HBase

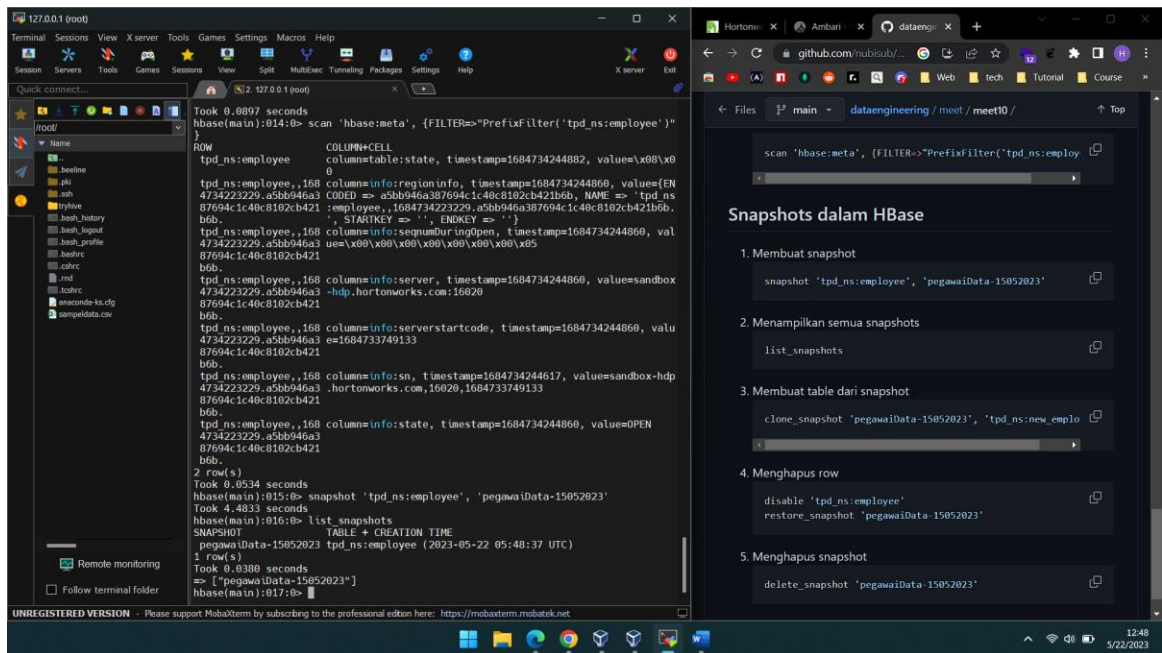
1. Membuat snapshot

snapshot 'tpd_ns:employee', 'pegawaiData-15052023'



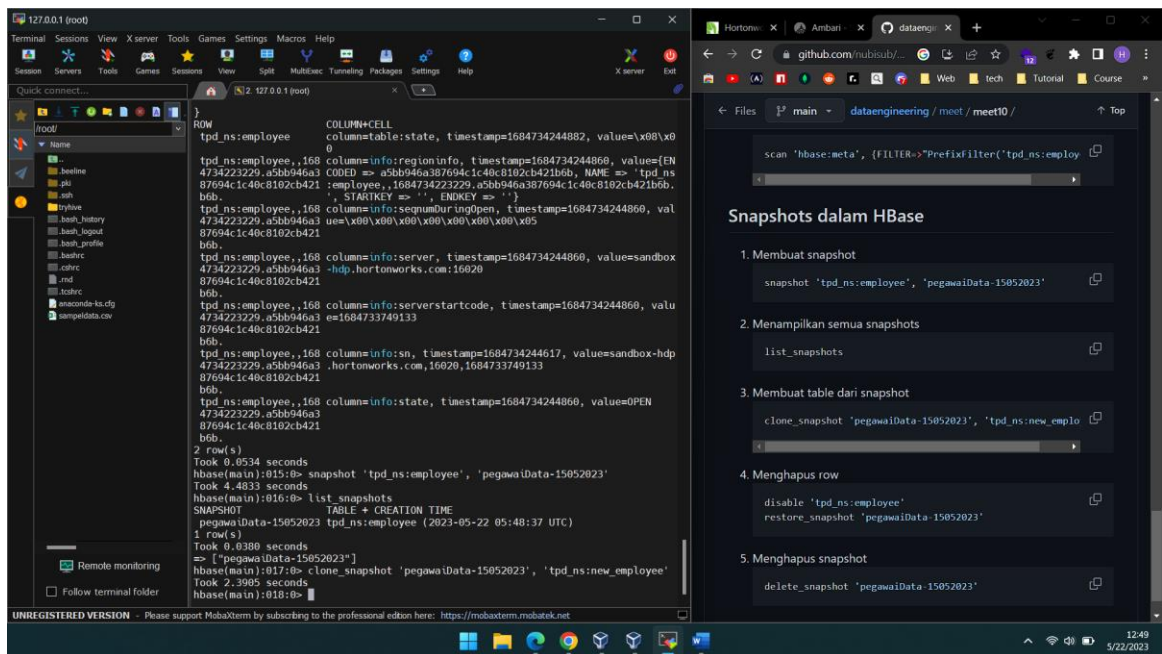
2. Menampilkan semua snapshots

list_snapshots



3. Membuat table dari snapshot

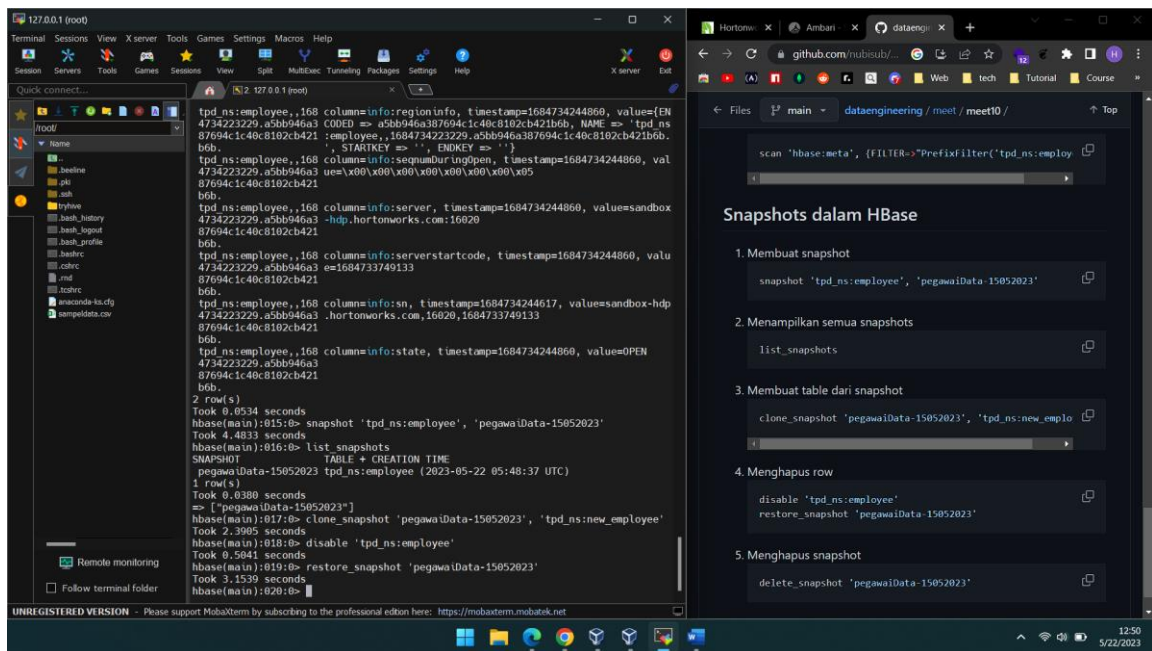
clone_snapshot 'pegawaiData-15052023', 'tpd_ns:new_employee'



4. Menghapus row

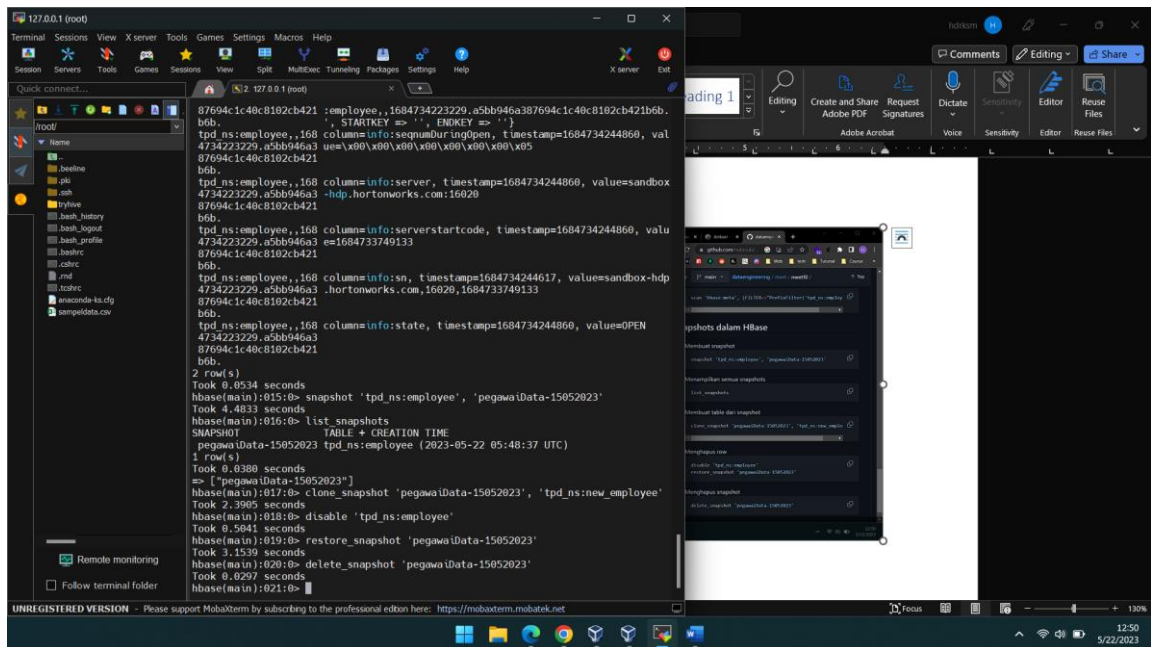
5. disable 'tpd_ns:employee'

restore_snapshot 'pegawaiData-15052023'



6. Menghapus snapshot

delete_snapshot 'pegawaiData-15052023'



1. Bandingkan performa read/write dengan Hive di praktikum modul sebelumnya, manakah yang relative lebih cepat?

Dilakukan pengujian menggunakan data user profile dengan 3 row baris saja

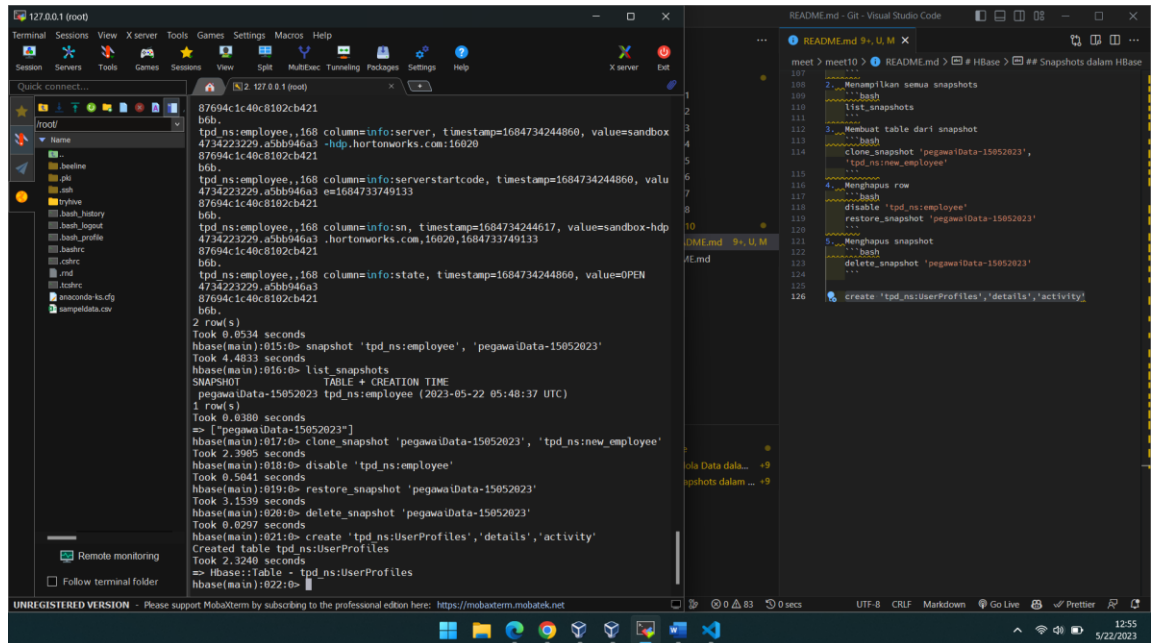
```

HIVE> : Completed executing command queryhive_20230522093322_fbc6a4b-555d-4f61-95a3-b43135b36; Time taken: 7.573 seconds
HIVE> : OK
HIVE> : No rows affected (0.417 seconds)
HIVE> : OK
HIVE> : Completed executing command queryhive_20230522093406_31cd016-fd9a-4e21-ba7e-3056c5fb4d0; select * from tryhive.userprofile
HIVE> : OK
HIVE> : Completed compiling command queryhive_20230522093406_31cd016-fd9a-4e21-ba7e-3056c5fb4d0; Time taken: 0.238 seconds
HIVE> : Returning Hive schema: Schema(fieldSchemas:[FieldSchema(name=userprofile.rowkey, type=varchar(10), comment=null), FieldSchema(name=userprofile.location, type=varchar(50), comment=null), FieldSchema(name=userprofile.name, type=varchar(50), comment=null), FieldSchema(name=userprofile.age, type=int, comment=null), FieldSchema(name=userprofile.lastlogin, type=date, comment=null), FieldSchema(name=userprofile.posts, type=int, comment=null), FieldSchema(name=userprofile.followers, type=int, comment=null)], properties={})
HIVE> : Executing command queryhive_20230522093406_31cd016-fd9a-4e21-ba7e-3056c5fb4d0; select * from tryhive.userprofile
HIVE> : Completed compiling command queryhive_20230522093406_31cd016-fd9a-4e21-ba7e-3056c5fb4d0; Time taken: 0.005 seconds
HIVE> : OK
=====
userprofile.rowkey | userprofile.location | userprofile.name | userprofile.age | userprofile.lastlogin | userprofile.posts | userprofile.followers |
=====
User10001 | New York | John Smith | 32 | 2023-05-12 | 25 | 1000 |
User10002 | New York | Sarah Johnson | 28 | 2023-05-13 | 50 | 1000 |
User10003 | Los Angeles | Michael Anderson | 45 | 2023-05-13 | 10 | 250 |
=====
0 rows selected (0.673 seconds)
HIVE> : OK
HIVE> : Completed executing command queryhive_20230522093440_1a6c07e-8204-4c5f-b761-202745f614db; select * from tryhive.userprofile where location = "New York"
HIVE> : OK
HIVE> : Completed compiling command queryhive_20230522093440_1a6c07e-8204-4c5f-b761-202745f614db; Time taken: 0.356 seconds
HIVE> : Returning Hive schema: Schema(fieldSchemas:[FieldSchema(name=userprofile.rowkey, type=varchar(10), comment=null), FieldSchema(name=userprofile.location, type=varchar(50), comment=null), FieldSchema(name=userprofile.name, type=varchar(50), comment=null), FieldSchema(name=userprofile.age, type=int, comment=null), FieldSchema(name=userprofile.lastlogin, type=date, comment=null), FieldSchema(name=userprofile.posts, type=int, comment=null), FieldSchema(name=userprofile.followers, type=int, comment=null)], properties={})
HIVE> : Executing command queryhive_20230522093440_1a6c07e-8204-4c5f-b761-202745f614db; select * from tryhive.userprofile where location = "New York"
HIVE> : Completed compiling command queryhive_20230522093440_1a6c07e-8204-4c5f-b761-202745f614db; Time taken: 0.007 seconds
HIVE> : OK
=====
userprofile.rowkey | userprofile.location | userprofile.name | userprofile.age | userprofile.lastlogin | userprofile.posts | userprofile.followers |
=====
User10002 | New York | Sarah Johnson | 28 | 2023-05-12 | 50 | 1000 |
=====
0 rows selected (0.706 seconds)
HIVE> : OK
  
```

	Hive (seconds)	Hbase (seconds)
Write	8.417	0.192
Read	1.846	0.706

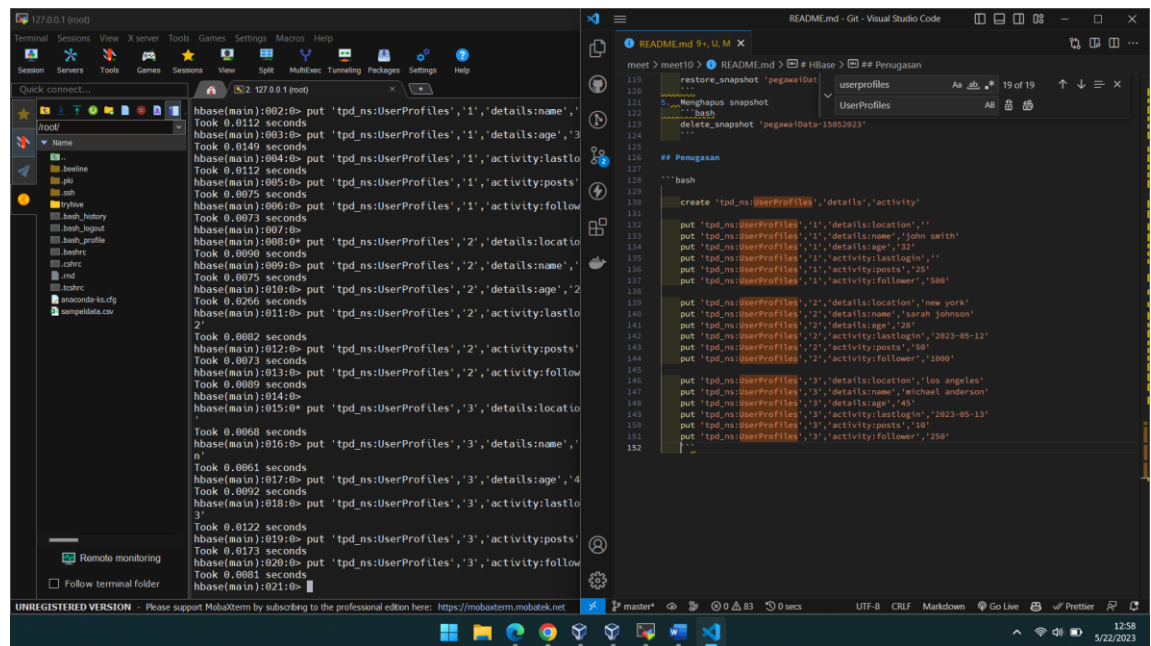
Dari pengujian di atas dapat disimpulkan bahwa performa read dan write pada Hbase lebih baik dari Hive

2. Buat table UserProfiles



```
127.0.0.1 (root)
root@127.0.0.1:~$ hbase(main):001:0> create 'tpd_ns:employee', '1684734244860', 'value=sandbox'
Created table tpd_ns:employee
hbase(main):001:0> clone_snapshot 'pegawaData-15052023', 'tpd_ns:employee'
Cloned snapshot 'pegawaData-15052023' to 'tpd_ns:employee'
hbase(main):001:0> list_snapshots
SNAPSHOT      TABLE + CREATION TIME
pegawaData-15052023  tpd_ns:employee (2023-05-22 05:48:37 UTC)
1 row(s)
hbase(main):001:0> restore_snapshot 'pegawaData-15052023'
Restored snapshot 'pegawaData-15052023' to 'tpd_ns:employee'
hbase(main):001:0> delete_snapshot 'pegawaData-15052023'
Deleted snapshot 'pegawaData-15052023'
hbase(main):001:0> create 'tpd_ns:UserProfiles', 'details', 'activity'
Created table tpd_ns:UserProfiles
hbase(main):001:0> show 'tpd_ns:UserProfiles'
HBase: Table - tpd_ns:UserProfiles
hbase(main):001:0>
```

```
README.md - Git - Visual Studio Code
meet > meet10 > README.md > # HBase > ## Snapshots dalam HBase
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```
127.0.0.1 (root)
root@127.0.0.1:~$ hbase(main):001:0> create 'tpd_ns:employee', '1684734244860', 'value=sandbox'
Created table tpd_ns:employee
hbase(main):001:0> clone_snapshot 'pegawaData-15052023', 'tpd_ns:employee'
Cloned snapshot 'pegawaData-15052023' to 'tpd_ns:employee'
hbase(main):001:0> list_snapshots
SNAPSHOT      TABLE + CREATION TIME
pegawaData-15052023  tpd_ns:employee (2023-05-22 05:48:37 UTC)
1 row(s)
hbase(main):001:0> restore_snapshot 'pegawaData-15052023'
Restored snapshot 'pegawaData-15052023' to 'tpd_ns:employee'
hbase(main):001:0> delete_snapshot 'pegawaData-15052023'
Deleted snapshot 'pegawaData-15052023'
hbase(main):001:0> create 'tpd_ns:UserProfiles', 'details', 'activity'
Created table tpd_ns:UserProfiles
hbase(main):001:0> show 'tpd_ns:UserProfiles'
HBase: Table - tpd_ns:UserProfiles
hbase(main):001:0>
```

```
README.md - Git - Visual Studio Code
meet > meet10 > README.md > # HBase > ## Pengisian
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- a. Query untuk Nama user yang berlokasi di New York

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127.0.0.1 (root)
Terminal Sessions View X server Tools Games Settings Macros Help
Quick connect...
root/
  Name
  .baseline
  .bash_history
  .bash_logout
  .bash_profile
  .bashrc
  .cdrc
  .md
  .kchrc
  .anaconda-ks.cfg
  .sampledata.csv
  Remote monitoring
  Follow terminal folder
  UNREGISTERED VERSION - Please support MobaxTerm by subscribing to the professional edition here: https://mobaxterm.mobatek.net

Took 0.0127 seconds
hbase(main):055:0> scan 'tpd_ns:UserProfiles', {
  COLUMNS => ['details:name', 'details:location'],
  FILTER => SingleColumnValueFilter.new(Bytes.toBytes('details'), Bytes.toBytes('location'), CompareFilter::CompareOp.valueOf('EQUAL'), BinaryComparator.new(Bytes.toBytes('new york')))
}
hbase(main):056:2>
hbase(main):058:2>
hbase(main):059:2>
hbase(main):060:2> scan 'tpd_ns:UserProfiles', {FILTER => "SingleColumnValueFilter('details', 'location',=, 'binary:new york')", COLUMNS => ["details:name", "details:location"]}
hbase(main):061:2> /q
hbase(main):062:2> \q
hbase(main):063:2>
hbase(main):064:2> [root@sandbox-hdp ~]# hbase shell
HBase Shell
Use "help" to get list of supported commands.
Use "exit" to quit this interactive shell.
Version 2.0.0.3.0.1.0-187, re9fcf450949102de5069b257a6dee469b8f5aab3, Wed Sep 19 10:16:35 UTC 2018
hbase(main):001:0> scan 'tpd_ns:UserProfiles', {
  COLUMNS => ["details:name", "details:location"],
  FILTER => SingleColumnValueFilter.new(Bytes.toBytes('details'), Bytes.toBytes('location'), CompareFilter::CompareOp.valueOf('EQUAL'), BinaryComparator.new(Bytes.toBytes('new york')))
}
hbase(main):004:1>
NameError: uninitialized constant SingleColumnValueFilter
hbase(main):005:0> import org.apache.hadoop.hbase.filter.SingleColumnValueFilter
=> [Java:org.apache.hadoop.hbase.filter.SingleColumnValueFilter]
hbase(main):006:0> import org.apache.hadoop.hbase.filter.CompareFilter
=> [Java:org.apache.hadoop.hbase.filter.CompareFilter]
hbase(main):007:0> import org.apache.hadoop.hbase.filter.BinaryComparator
=> [Java:org.apache.hadoop.hbase.filter.BinaryComparator]
hbase(main):008:0> scan 'tpd_ns:UserProfiles', {
  COLUMNS => ["details:name", "details:location"],
  FILTER => SingleColumnValueFilter.new(Bytes.toBytes('details'), Bytes.toBytes('location'), CompareFilter::CompareOp.valueOf('EQUAL'), BinaryComparator.new(Bytes.toBytes('new york')))
}
hbase(main):011:1>
ROW
COLUMN+CELL
column=details:location, timestamp=1684735114200, value=new york
column=details:name, timestamp=1684735114257, value=sarah johnson
1 row(s)
Took 0.5652 seconds
hbase(main):012:0>
```

- b. Query untuk Nama dan last login user yang melakukan posting lebih dari 20 kali

```
127.0.0.1 (root)
Terminal Sessions View X server Tools Games Settings Macros Help
Quick connect...
root/
  Name
  .baseline
  .bash_history
  .bash_logout
  .bash_profile
  .bashrc
  .cdrc
  .md
  .kchrc
  .anaconda-ks.cfg
  .sampledata.csv
  Remote monitoring
  Follow terminal folder
  UNREGISTERED VERSION - Please support MobaxTerm by subscribing to the professional edition here: https://mobaxterm.mobatek.net

column=details:location, timestamp=1684735114200, value=new york
column=details:name, timestamp=1684735114257, value=sarah johnson
column=activity:follower, timestamp=1684735116834, value=250
column=activity:lastlogin, timestamp=1684735114670, value=2023-05-13
column=activity:posts, timestamp=1684735114737, value=10
column=details:age, timestamp=1684735114635, value=45
column=details:location, timestamp=1684735114541, value=los angeles
column=details:name, timestamp=1684735114605, value=michael anderson
3 row(s)
Took 0.0198 seconds
hbase(main):017:0> scan 'tpd_ns:UserProfiles', {
  FILTER => SingleColumnValueFilter.new(Bytes.toBytes('activity'), Bytes.toBytes('posts'), CompareFilter::CompareOp.valueOf('GREATER'), BinaryComparator.new(Bytes.toBytes('20')))
}
ROW
COLUMN+CELL
column=activity:follower, timestamp=1684735114114, value=500
column=activity:lastlogin, timestamp=1684735113973, value=
column=activity:posts, timestamp=1684735114041, value=25
column=details:age, timestamp=1684735113923, value=32
column=details:location, timestamp=1684735113750, value=
column=details:name, timestamp=1684735113026, value=john smith
column=activity:follower, timestamp=1684735114478, value=1000
column=activity:lastlogin, timestamp=1684735114381, value=2023-05-12
column=activity:posts, timestamp=1684735114437, value=50
column=details:age, timestamp=1684735114319, value=28
column=details:location, timestamp=1684735114200, value=new york
column=details:name, timestamp=1684735114257, value=sarah johnson
2 row(s)
Took 0.0312 seconds
hbase(main):019:0> scan 'tpd_ns:UserProfiles', {
  COLUMNS => ["details:name", "activity:lastlogin", "activity:posts"],
  FILTER => SingleColumnValueFilter.new(Bytes.toBytes('activity'), Bytes.toBytes('posts'), CompareFilter::CompareOp.valueOf('GREATER'), BinaryComparator.new(Bytes.toBytes('20')))
}
ROW
COLUMN+CELL
column=activity:lastlogin, timestamp=1684735113973, value=
column=activity:posts, timestamp=1684735114041, value=25
column=details:name, timestamp=1684735113825, value=john smith
column=activity:lastlogin, timestamp=1684735114381, value=2023-05-12
column=activity:posts, timestamp=1684735114437, value=50
column=details:name, timestamp=1684735114257, value=sarah johnson
2 row(s)
Took 0.0549 seconds
hbase(main):022:0>
```