

## HBase

- Table Creation

```
just raised the bar for easy, resilient and secure K8s cluster deployment.
https://ubuntu.com/engage/secure-kubernetes-at-the-edge

Expanded Security Maintenance for Applications is not enabled.

12 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

Last login: Sun Apr 14 03:07:54 2024 from 73.212.143.78
[gracieinman@big-data-week1-instance: ~]$ cd bellevue-bigdata
[bash: cd: bellevue-bigdata: No such file or directory
[gracieinman@big-data-week1-instance: ~]$ cd dsc650-infra-main
[gracieinman@big-data-week1-instance: ~/dsc650-infra-main]$ cd bellevue-bigdata
[gracieinman@big-data-week1-instance: ~/dsc650-infra-main/bellevue-bigdata]$ cd hadoop-hive-spark-hbase
[gracieinman@big-data-week1-instance: ~/dsc650-infra-main/bellevue-bigdata/hadoop-hive-spark-hbase]$ docker-compose up -d
Creating network "hadoop-hive-spark-hbase_spark_net" with the default driver
Creating hadoop-hive-spark-hbase_zoo3_1 ... done
Creating hadoop-hive-spark-hbase_zoo2_1 ... done
Creating hadoop-hive-spark-hbase_zoo1_1 ... done
Creating hadoop-hive-spark-hbase_worker1_1 ... done
Creating hadoop-hive-spark-hbase_worker2_1 ... done
Creating hadoop-hive-spark-hbase_master_1 ... done
[gracieinman@big-data-week1-instance: ~/dsc650-infra-main/bellevue-bigdata/hadoop-hive-spark-hbase]$ docker-compose exec master bash
bash-5.2# hbase shell
2024-04-21 16:01:42,915 WARN [main] util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-Java classes where applicable
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 2.3.6, r7414579f2620fcab6b75146c29ab2726fc4643ac9, Wed Jul 28 22:24:42 UTC 2021
Took 0.0263 seconds
hbase(main):001:0> create 'students', 'details'
ERROR: KeeperErrorCode = NoNode for /hbase/master
For usage try 'help "create"'.

Took 0.1918 seconds
hbase(main):002:0> list
TABLE
ERROR: KeeperErrorCode = NoNode for /hbase/master
For usage try 'help "list"'.

Took 0.0128 seconds
hbase(main):003:0> create 'students', 'details'
Created table students
Took 1.3891 seconds
=> Hbase::Table - students
hbase(main):004:0> █
```

- Tables listed

```
=> Hbase::Table - students
hbase(main):004:0> list
TABLE
students
1 row(s)
Took 0.0383 seconds
=> ["students"]
hbase(main):005:0> █
```



- Add Data

```
=> ["students"]
hbase(main):005:0> put 'students', '1', 'details:firstName', 'John'
Took 0.2289 seconds
hbase(main):006:0> put 'students', '1', 'details:lastName', 'Doe'
Took 0.0081 seconds
hbase(main):007:0> █
```



- ID 1 Query

```
Took 0.0001 seconds
hbase(main):007:0> get 'students', '1'
COLUMN                                     CELL
  details:firstName                         timestamp=2024-04-21T16:07:12.159, value=John
  details:lastName                          timestamp=2024-04-21T16:07:19.543, value=Doe
1 row(s)
Took 0.0730 seconds
hbase(main):008:0> █
```

- Order Table

```
hbase(main):008:0> create 'orders', 'orderDetails'
Created table orders
Took 2.161 seconds
=> Hbase::Table - orders
hbase(main):009:0> put 'orders', '101:20230806', 'orderDetails:item', 'Laptop'
Took 0.0975 seconds
hbase(main):010:0> put 'orders', '102:20230806', 'orderDetails:item', 'Smartphone'
Took 0.0162 seconds
hbase(main):011:0> scan 'orders', {STARTROW => '101:', ENDROW => '101:-'}
ROW
 101:20230806
  column=orderDetails:item, timestamp=2024-04-21T16:09:01.770, value=Laptop
1 row(s)
Took 0.0235 seconds
hbase(main):012:0>
```

- Students table insert data

```
hbase(main):043:0> (2..100).each do |i|
  hbase(main):044:1*   first_name = "Student#{i}"
  hbase(main):044:1*   last_name = "LastName#{i}"
  hbase(main):044:1>   put 'students', "##{i}", 'details:firstName', first_name
  hbase(main):047:1>   put 'students', "##{i}", 'details:lastName', last_name
hbase(main):048:1> end
Took 0.0060 seconds
Took 0.0043 seconds
Took 0.0053 seconds
Took 0.0050 seconds
Took 0.0054 seconds
Took 0.0039 seconds
Took 0.0054 seconds
Took 0.0038 seconds
Took 0.0064 seconds
Took 0.0072 seconds
Took 0.0047 seconds
Took 0.0041 seconds
Took 0.0044 seconds
Took 0.0061 seconds
Took 0.0054 seconds
Took 0.0044 seconds
Took 0.0054 seconds
Took 0.0028 seconds
Took 0.0029 seconds
Took 0.0045 seconds
Took 0.0067 seconds
Took 0.0053 seconds
Took 0.0051 seconds
Took 0.0045 seconds
Took 0.0058 seconds
Took 0.0034 seconds
Took 0.0045 seconds
Took 0.0035 seconds
Took 0.0044 seconds
Took 0.0036 seconds
Took 0.0026 seconds
Took 0.0018 seconds
Took 0.0018 seconds
Took 0.0029 seconds
Took 0.0037 seconds
Took 0.0030 seconds
Took 0.0020 seconds
Took 0.0034 seconds
Took 0.0055 seconds
Took 0.0045 seconds
Took 0.0037 seconds
Took 0.0027 seconds
Took 0.0021 seconds
Took 0.0047 seconds
Took 0.0026 seconds
Took 0.0024 seconds
Took 0.0018 seconds
Took 0.0015 seconds
Took 0.0017 seconds
Took 0.0030 seconds
Took 0.0022 seconds
Took 0.0060 seconds
Took 0.0065 seconds
Took 0.0060 seconds
Took 0.0054 seconds
Took 0.0068 seconds
Took 0.0079 seconds
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Took 0.0079 seconds
Took 0.0052 seconds
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Took 0.0051 seconds
Took 0.0063 seconds
Took 0.0070 seconds
Took 0.0039 seconds
Took 0.0027 seconds
Took 0.0031 seconds
Took 0.0045 seconds
Took 0.0045 seconds
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Took 0.0057 seconds
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Took 0.0043 seconds
Took 0.0054 seconds
Took 0.0108 seconds
Took 0.0053 seconds
Took 0.0035 seconds
Took 0.0029 seconds
Took 0.0030 seconds
Took 0.0033 seconds
Took 0.0029 seconds
Took 0.0056 seconds
Took 0.0051 seconds
Took 0.0055 seconds
Took 0.0038 seconds
Took 0.0038 seconds
Took 0.0039 seconds
Took 0.0036 seconds
Took 0.0042 seconds
Took 0.0038 seconds
Took 0.0035 seconds
Took 0.0035 seconds
Took 0.0048 seconds
Took 0.0049 seconds
Took 0.0029 seconds
Took 0.0026 seconds
Took 0.0044 seconds
Took 0.0031 seconds
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Took 0.0029 seconds
Took 0.0025 seconds
Took 0.0043 seconds
Took 0.0043 seconds
Took 0.0033 seconds
Took 0.0029 seconds
Took 0.0038 seconds
Took 0.0046 seconds
Took 0.0102 seconds
Took 0.0037 seconds
Took 0.0032 seconds
Took 0.0032 seconds
Took 0.0031 seconds
Took 0.0032 seconds
Took 0.0037 seconds
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Took 0.0032 seconds
Took 0.0052 seconds
Took 0.0048 seconds
= 7.100
```

## • Student data scan

```
hbase(main):051:0> scan 'students'
ROW                                     COLUMN+CELL
1                                         column=details:firstName, timestamp=2024-04-21T16:07:12.159, value=John
1                                         column=details:lastName, timestamp=2024-04-21T16:07:19.543, value=Doe
1                                         column=details:firstName, timestamp=2024-04-21T16:13:55.386, value=Student10
1                                         column=details:lastName, timestamp=2024-04-21T16:13:55.394, value=LastName10
1                                         column=details:firstName, timestamp=2024-04-21T16:13:55.285, value=Student100
1                                         column=details:lastName, timestamp=2024-04-21T16:13:55.393, value=Student100
1                                         column=details:lastName, timestamp=2024-04-21T16:13:55.393, value=LastName11
1                                         column=details:firstName, timestamp=2024-04-21T16:13:55.406, value=Student12
1                                         column=details:lastName, timestamp=2024-04-21T16:13:55.413, value=LastName12
1                                         column=details:firstName, timestamp=2024-04-21T16:13:55.419, value=Student13
1                                         column=details:lastName, timestamp=2024-04-21T16:13:55.426, value=LastName13
1                                         column=details:firstName, timestamp=2024-04-21T16:13:55.437, value=Student14
1                                         column=details:lastName, timestamp=2024-04-21T16:13:55.441, value=Student15
1                                         column=details:firstName, timestamp=2024-04-21T16:13:55.444, value=LastName15
1                                         column=details:lastName, timestamp=2024-04-21T16:13:55.451, value=Student16
1                                         column=details:lastName, timestamp=2024-04-21T16:13:55.455, value=LastName16
1                                         column=details:firstName, timestamp=2024-04-21T16:13:55.457, value=Student17
1                                         column=details:lastName, timestamp=2024-04-21T16:13:55.461, value=LastName17
1                                         column=details:firstName, timestamp=2024-04-21T16:13:55.463, value=Student18
1                                         column=details:lastName, timestamp=2024-04-21T16:13:55.465, value=LastName18
1                                         column=details:firstName, timestamp=2024-04-21T16:13:55.478, value=Student19
1                                         column=details:lastName, timestamp=2024-04-21T16:13:55.473, value=LastName19
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.479, value=Student20
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.487, value=LastName2
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.476, value=Student20
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.476, value=LastName20
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.484, value=Student21
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.495, value=Student22
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.503, value=Student23
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.503, value=LastName23
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.509, value=Student24
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.516, value=LastName24
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.518, value=Student25
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.521, value=LastName25
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.523, value=Student26
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.524, value=LastName26
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.527, value=Student27
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.538, value=LastName27
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.534, value=Student28
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.538, value=LastName28
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.541, value=Student29
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.555, value=LastName29
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.393, value=Student3
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.386, value=LastName3
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.561, value=Student30
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.567, value=LastName30
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.574, value=Student31
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.584, value=LastName31
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.591, value=Student32
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.597, value=LastName32
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.603, value=Student33
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.611, value=LastName33
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.627, value=Student34
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.627, value=LastName34
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.625, value=Student35
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.638, value=LastName35
2                                         column=details:firstName, timestamp=2024-04-21T16:13:55.634, value=Student36
2                                         column=details:lastName, timestamp=2024-04-21T16:13:55.639, value=LastName36
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35 column=details:lastName, timestamp=2024-04-21T16:13:55.636, value=LastName35
36 column=details:firstName, timestamp=2024-04-21T16:13:55.634, value=Student36
37 column=details:lastName, timestamp=2024-04-21T16:13:55.635, value=LastName37
38 column=details:firstName, timestamp=2024-04-21T16:13:55.645, value=Student37
39 column=details:lastName, timestamp=2024-04-21T16:13:55.654, value=LastName38
40 column=details:lastName, timestamp=2024-04-21T16:13:55.664, value=Student38
41 column=details:firstName, timestamp=2024-04-21T16:13:55.674, value=LastName39
42 column=details:lastName, timestamp=2024-04-21T16:13:55.675, value=Student39
43 column=details:lastName, timestamp=2024-04-21T16:13:55.679, value=LastName39
44 column=details:lastName, timestamp=2024-04-21T16:13:55.326, value=Student40
45 column=details:firstName, timestamp=2024-04-21T16:13:55.698, value=LastName40
46 column=details:firstName, timestamp=2024-04-21T16:13:55.698, value=Student40
47 column=details:lastName, timestamp=2024-04-21T16:13:55.707, value=LastName41
48 column=details:firstName, timestamp=2024-04-21T16:13:55.707, value=Student41
49 column=details:lastName, timestamp=2024-04-21T16:13:55.721, value=Student43
50 column=details:firstName, timestamp=2024-04-21T16:13:55.724, value=LastName43
51 column=details:firstName, timestamp=2024-04-21T16:13:55.734, value=Student44
52 column=details:lastName, timestamp=2024-04-21T16:13:55.739, value=LastName44
53 column=details:firstName, timestamp=2024-04-21T16:13:55.746, value=Student45
54 column=details:lastName, timestamp=2024-04-21T16:13:55.753, value=LastName45
55 column=details:firstName, timestamp=2024-04-21T16:13:55.765, value=Student46
56 column=details:lastName, timestamp=2024-04-21T16:13:55.768, value=LastName46
57 column=details:lastName, timestamp=2024-04-21T16:13:55.764, value=Student47
58 column=details:firstName, timestamp=2024-04-21T16:13:55.772, value=Student48
59 column=details:lastName, timestamp=2024-04-21T16:13:55.782, value=Student48
60 column=details:firstName, timestamp=2024-04-21T16:13:55.782, value=Student49
61 column=details:lastName, timestamp=2024-04-21T16:13:55.787, value=LastName49
62 column=details:firstName, timestamp=2024-04-21T16:13:55.792, value=Student50
63 column=details:lastName, timestamp=2024-04-21T16:13:55.795, value=Student51
64 column=details:firstName, timestamp=2024-04-21T16:13:55.797, value=Student51
65 column=details:lastName, timestamp=2024-04-21T16:13:55.804, value=LastName51
66 column=details:lastName, timestamp=2024-04-21T16:13:55.809, value=Student52
67 column=details:lastName, timestamp=2024-04-21T16:13:55.812, value=LastName52
68 column=details:firstName, timestamp=2024-04-21T16:13:55.816, value=Student53
69 column=details:lastName, timestamp=2024-04-21T16:13:55.819, value=LastName53
70 column=details:firstName, timestamp=2024-04-21T16:13:55.825, value=Student54
71 column=details:lastName, timestamp=2024-04-21T16:13:55.826, value=LastName54
72 column=details:firstName, timestamp=2024-04-21T16:13:55.838, value=Student55
73 column=details:lastName, timestamp=2024-04-21T16:13:55.834, value=LastName55
74 column=details:firstName, timestamp=2024-04-21T16:13:55.837, value=Student56
75 column=details:lastName, timestamp=2024-04-21T16:13:55.843, value=LastName56
76 column=details:firstName, timestamp=2024-04-21T16:13:55.846, value=Student56
77 column=details:lastName, timestamp=2024-04-21T16:13:55.851, value=LastName57
78 column=details:firstName, timestamp=2024-04-21T16:13:55.871, value=Student58
79 column=details:lastName, timestamp=2024-04-21T16:13:55.873, value=LastName58
80 column=details:firstName, timestamp=2024-04-21T16:13:55.882, value=Student59
81 column=details:lastName, timestamp=2024-04-21T16:13:55.884, value=LastName59
82 column=details:firstName, timestamp=2024-04-21T16:13:55.894, value=Student60
83 column=details:lastName, timestamp=2024-04-21T16:13:55.898, value=LastName60
84 column=details:firstName, timestamp=2024-04-21T16:13:55.903, value=Student61
85 column=details:lastName, timestamp=2024-04-21T16:13:55.907, value=LastName61
86 column=details:firstName, timestamp=2024-04-21T16:13:55.911, value=Student62
87 column=details:lastName, timestamp=2024-04-21T16:13:55.914, value=LastName62
88 column=details:firstName, timestamp=2024-04-21T16:13:55.919, value=Student63
89 column=details:lastName, timestamp=2024-04-21T16:13:55.926, value=LastName63
90 column=details:firstName, timestamp=2024-04-21T16:13:55.929, value=Student64
91 column=details:lastName, timestamp=2024-04-21T16:13:55.933, value=LastName64
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71      column=details:lastName, timestamp=2024-04-21T16:13:56.004, value=LastName71
72      column=details:firstName, timestamp=2024-04-21T16:13:56.012, value=Student72
73      column=details:lastName, timestamp=2024-04-21T16:13:56.019, value=LastName72
74      column=details:lastName, timestamp=2024-04-21T16:13:56.023, value=Student73
75      column=details:firstName, timestamp=2024-04-21T16:13:56.027, value=LastName73
76      column=details:lastName, timestamp=2024-04-21T16:13:56.032, value=Student74
77      column=details:lastName, timestamp=2024-04-21T16:13:56.038, value=LastName74
78      column=details:firstName, timestamp=2024-04-21T16:13:56.044, value=Student75
79
80      column=details:lastName, timestamp=2024-04-21T16:13:56.049, value=LastName75
81      column=details:firstName, timestamp=2024-04-21T16:13:56.056, value=Student76
82      column=details:lastName, timestamp=2024-04-21T16:13:56.064, value=LastName76
83      column=details:firstName, timestamp=2024-04-21T16:13:56.069, value=Student77
84      column=details:lastName, timestamp=2024-04-21T16:13:56.075, value=LastName77
85      column=details:firstName, timestamp=2024-04-21T16:13:56.088, value=Student78
86      column=details:lastName, timestamp=2024-04-21T16:13:56.094, value=LastName78
87      column=details:firstName, timestamp=2024-04-21T16:13:56.099, value=Student79
88      column=details:lastName, timestamp=2024-04-21T16:13:56.099, value=LastName79
89      column=details:firstName, timestamp=2024-04-21T16:13:56.104, value=Student80
90      column=details:lastName, timestamp=2024-04-21T16:13:56.109, value=LastName80
91      column=details:firstName, timestamp=2024-04-21T16:13:56.115, value=Student81
92      column=details:lastName, timestamp=2024-04-21T16:13:56.103, value=LastName81
93      column=details:firstName, timestamp=2024-04-21T16:13:56.106, value=Student82
94      column=details:lastName, timestamp=2024-04-21T16:13:56.109, value=LastName82
95      column=details:firstName, timestamp=2024-04-21T16:13:56.113, value=Student83
96      column=details:lastName, timestamp=2024-04-21T16:13:56.119, value=LastName83
97      column=details:firstName, timestamp=2024-04-21T16:13:56.125, value=Student84
98      column=details:lastName, timestamp=2024-04-21T16:13:56.130, value=LastName84
99      column=details:firstName, timestamp=2024-04-21T16:13:56.134, value=Student85
100     column=details:lastName, timestamp=2024-04-21T16:13:56.139, value=LastName85
101
102     column=details:firstName, timestamp=2024-04-21T16:13:56.146, value=Student86
103     column=details:lastName, timestamp=2024-04-21T16:13:56.152, value=LastName86
104     column=details:firstName, timestamp=2024-04-21T16:13:56.159, value=Student87
105     column=details:lastName, timestamp=2024-04-21T16:13:56.159, value=LastName87
106     column=details:firstName, timestamp=2024-04-21T16:13:56.159, value=Student88
107     column=details:lastName, timestamp=2024-04-21T16:13:56.174, value=LastName88
108     column=details:firstName, timestamp=2024-04-21T16:13:56.179, value=Student89
109     column=details:lastName, timestamp=2024-04-21T16:13:56.184, value=LastName89
110     column=details:firstName, timestamp=2024-04-21T16:13:56.194, value=Student90
111     column=details:lastName, timestamp=2024-04-21T16:13:56.199, value=LastName90
112     column=details:firstName, timestamp=2024-04-21T16:13:56.199, value=Student90
113     column=details:lastName, timestamp=2024-04-21T16:13:56.199, value=LastName90
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199 rows(s)
Took 0.2979 seconds
hbase[main]:052> 
```

- Update first name

```

199 row(s)
Took 0.5873 seconds
hbase[main]:003> (2..50).each do |i|
hbase[main]:004> i* new_first_name = "Scholar#{i}"
hbase[main]:005> puts 'students', "#{i}", 'details:firstName', new_first_name
Hbase[main]:006> end
Took 0.0531 seconds
Took 0.0859 seconds
Took 0.0853 seconds
Took 0.0847 seconds
Took 0.0855 seconds
Took 0.0846 seconds
Took 0.0852 seconds
Took 0.0877 seconds
Took 0.0884 seconds
Took 0.0844 seconds
Took 0.0837 seconds
Took 0.0869 seconds
Took 0.0851 seconds
Took 0.0848 seconds
Took 0.0852 seconds
Took 0.0812 seconds
Took 0.0867 seconds
Took 0.0836 seconds
Took 0.0858 seconds
Took 0.0871 seconds
Took 0.0854 seconds
Took 0.0853 seconds
Took 0.0855 seconds
Took 0.0846 seconds
Took 0.0838 seconds
Took 0.0855 seconds
Took 0.0866 seconds
Took 0.0854 seconds
Took 0.0871 seconds
Took 0.0876 seconds
Took 0.0861 seconds
Took 0.0865 seconds
Took 0.0859 seconds
Took 0.0871 seconds
Took 0.0870 seconds
Took 0.0813 seconds
Took 0.0853 seconds
Took 0.0842 seconds
Took 0.0869 seconds
Took 0.0866 seconds
Took 0.0856 seconds
Took 0.0861 seconds
Took 0.0865 seconds
Took 0.0859 seconds
Took 0.0870 seconds
Took 0.0814 seconds
Took 0.0813 seconds
Took 0.0846 seconds
Took 0.0816 seconds
Took 0.0867 seconds
Took 0.0814 seconds
Took 0.0814 seconds
=> 2..50

```

- Add middle name (issues with loop)

```

hbase(main):058:0> (51..75).each do |i|
hbase(main):059:1>   middle_name = "MidName#{i}"
hbase(main):060:1>   puts "put 'students', '#{i}', 'details:middleName', '#{middle_name}'"
hbase(main):061:1> end
put 'students', '51', 'details:middleName', 'MidName51'
put 'students', '52', 'details:middleName', 'MidName52'
put 'students', '53', 'details:middleName', 'MidName53'
put 'students', '54', 'details:middleName', 'MidName54'
put 'students', '55', 'details:middleName', 'MidName55'
put 'students', '56', 'details:middleName', 'MidName56'
put 'students', '57', 'details:middleName', 'MidName57'
put 'students', '58', 'details:middleName', 'MidName58'
put 'students', '59', 'details:middleName', 'MidName59'
put 'students', '60', 'details:middleName', 'MidName60'
put 'students', '61', 'details:middleName', 'MidName61'
put 'students', '62', 'details:middleName', 'MidName62'
put 'students', '63', 'details:middleName', 'MidName63'
put 'students', '64', 'details:middleName', 'MidName64'
put 'students', '65', 'details:middleName', 'MidName65'
put 'students', '66', 'details:middleName', 'MidName66'
put 'students', '67', 'details:middleName', 'MidName67'
put 'students', '68', 'details:middleName', 'MidName68'
put 'students', '69', 'details:middleName', 'MidName69'
put 'students', '70', 'details:middleName', 'MidName70'
put 'students', '71', 'details:middleName', 'MidName71'
put 'students', '72', 'details:middleName', 'MidName72'
put 'students', '73', 'details:middleName', 'MidName73'
put 'students', '74', 'details:middleName', 'MidName74'
put 'students', '75', 'details:middleName', 'MidName75'
=> 51..75
Hbase(main):062:0> get 'students', '60'
COLUMN
details:firstName          timestamp=2024-04-21T16:13:55.891, value=Student60
details:lastName           timestamp=2024-04-21T16:13:55.898, value=Lastname60
Hbase(main):063:0> put 'students', '51', 'details:middleName', 'MidName51'
Took 0.0059 seconds
hbase(main):064:0> put 'students', '52', 'details:middleName', 'MidName52'
Took 0.0053 seconds
hbase(main):065:0> put 'students', '53', 'details:middleName', 'MidName53'
Took 0.0054 seconds
Hbase(main):066:0> put 'students', '54', 'details:middleName', 'MidName54'
Took 0.0087 seconds
hbase(main):067:0> put 'students', '55', 'details:middleName', 'MidName55'
Took 0.0099 seconds
hbase(main):068:0> put 'students', '56', 'details:middleName', 'MidName56'
Took 0.0063 seconds
Hbase(main):069:0> put 'students', '57', 'details:middleName', 'MidName57'
Took 0.0054 seconds
hbase(main):070:0> put 'students', '58', 'details:middleName', 'MidName58'
Took 0.0051 seconds
hbase(main):071:0> put 'students', '59', 'details:middleName', 'MidName59'
Took 0.0055 seconds
hbase(main):072:0> put 'students', '60', 'details:middleName', 'MidName60'
Took 0.0063 seconds
hbase(main):073:0> put 'students', '61', 'details:middleName', 'MidName61'
Took 0.0068 seconds
hbase(main):074:0> put 'students', '62', 'details:middleName', 'MidName62'
Took 0.0063 seconds
hbase(main):075:0> put 'students', '63', 'details:middleName', 'MidName63'
Took 0.0064 seconds
hbase(main):076:0> put 'students', '64', 'details:middleName', 'MidName64'
Took 0.0058 seconds
hbase(main):077:0> put 'students', '65', 'details:middleName', 'MidName65'
Took 0.0063 seconds
hbase(main):078:0> put 'students', '66', 'details:middleName', 'MidName66'
Took 0.0063 seconds
Hbase(main):079:0> put 'students', '67', 'details:middleName', 'MidName67'
Took 0.0059 seconds
hbase(main):080:0> put 'students', '68', 'details:middleName', 'MidName68'
Took 0.0049 seconds
hbase(main):081:0> put 'students', '69', 'details:middleName', 'MidName69'
Took 0.0055 seconds
Hbase(main):082:0> put 'students', '70', 'details:middleName', 'MidName70'
Took 0.0071 seconds
hbase(main):083:0> put 'students', '71', 'details:middleName', 'MidName71'
Took 0.0049 seconds
hbase(main):084:0> put 'students', '72', 'details:middleName', 'MidName72'
Took 0.0056 seconds
hbase(main):085:0> put 'students', '73', 'details:middleName', 'MidName73'
Took 0.0066 seconds
hbase(main):086:0> put 'students', '74', 'details:middleName', 'MidName74'
Took 0.0059 seconds
hbase(main):087:0> put 'students', '75', 'details:middleName', 'MidName75'
Took 0.0051 seconds

```

- Modify last name (issues with loop)

```

hbase(main):089:0> {76..198}.each do |i|
  hbase(main):090:0>   modified.lastName = "lastName#{i}_Modified"
  hbase(main):091:0>   puts 'put students', "#{i}", 'details:lastName', '#{modified.lastName}'
hbase(main):092:1> end
put 'students', '76', 'details:lastName', 'LastName76_Modified'
put 'students', '77', 'details:lastName', 'LastName77_Modified'
put 'students', '78', 'details:lastName', 'LastName78_Modified'
put 'students', '79', 'details:lastName', 'LastName79_Modified'
put 'students', '80', 'details:lastName', 'LastName80_Modified'
put 'students', '81', 'details:lastName', 'LastName81_Modified'
put 'students', '82', 'details:lastName', 'LastName82_Modified'
put 'students', '83', 'details:lastName', 'LastName83_Modified'
put 'students', '84', 'details:lastName', 'LastName84_Modified'
put 'students', '85', 'details:lastName', 'LastName85_Modified'
put 'students', '86', 'details:lastName', 'LastName86_Modified'
put 'students', '87', 'details:lastName', 'LastName87_Modified'
put 'students', '88', 'details:lastName', 'LastName88_Modified'
put 'students', '89', 'details:lastName', 'LastName89_Modified'
put 'students', '90', 'details:lastName', 'LastName90_Modified'
put 'students', '91', 'details:lastName', 'LastName91_Modified'
put 'students', '92', 'details:lastName', 'LastName92_Modified'
put 'students', '93', 'details:lastName', 'LastName93_Modified'
put 'students', '94', 'details:lastName', 'LastName94_Modified'
put 'students', '95', 'details:lastName', 'LastName95_Modified'
put 'students', '96', 'details:lastName', 'LastName96_Modified'
put 'students', '97', 'details:lastName', 'LastName97_Modified'
put 'students', '98', 'details:lastName', 'LastName98_Modified'
put 'students', '99', 'details:lastName', 'LastName99_Modified'
put 'students', '100', 'details:lastName', 'LastName100_Modified'
=> 76..198
hbase(main):093:0> get 'students', '80'
COLUMN                                CELL
details:firstName                         timestamp=2024-04-21T16:13:56.093, value=Student80
details:lastName                          timestamp=2024-04-21T16:13:56.096, value=LastName80
1 row(s)
Took 0.0133 seconds

1 row(s)
Took 0.0133 seconds
hbase(main):094:0> put 'students', '76', 'details:lastName', 'LastName76_Modified'
Took 0.0084 seconds
hbase(main):095:0> put 'students', '77', 'details:lastName', 'LastName77_Modified'
Took 0.0062 seconds
hbase(main):096:0> put 'students', '78', 'details:lastName', 'LastName78_Modified'
Took 0.0062 seconds
hbase(main):097:0> put 'students', '79', 'details:lastName', 'LastName79_Modified'
Took 0.0059 seconds
'
put 'students', '92', 'details:lastName', 'LastName92_Modified'
put 'students', '93', 'details:lastName', 'LastName93_Modified'
put 'students', '94', 'details:lastName', 'LastName94_Modified'
put 'students', '95', 'details:lastName', 'LastName95_Modified'
put 'students', '96', 'details:lastName', 'LastName96_Modified'
put 'students', '97', 'details:lastName', 'LastName97_Modified'
put 'students', '98', 'details:lastName', 'LastName98_Modified'
put 'students', '99', 'details:lastName', 'LastName99_Modified'
put 'students', '100', 'details:lastName', 'LastName100_Modified'
Hbase(main):099:0> put 'students', '80', 'details:lastName', 'LastName80_Modified'
Took 0.0043 seconds
hbase(main):099:0> put 'students', '81', 'details:lastName', 'LastName81_Modified'
Took 0.0035 seconds
hbase(main):100:0> put 'students', '82', 'details:lastName', 'LastName82_Modified'
Took 0.0063 seconds
hbase(main):101:0> put 'students', '83', 'details:lastName', 'LastName83_Modified'
Took 0.0055 seconds
hbase(main):102:0> put 'students', '84', 'details:lastName', 'LastName84_Modified'
Took 0.0046 seconds
hbase(main):103:0> put 'students', '85', 'details:lastName', 'LastName85_Modified'
Took 0.0062 seconds
hbase(main):104:0> put 'students', '86', 'details:lastName', 'LastName86_Modified'
Took 0.0042 seconds
hbase(main):105:0> put 'students', '87', 'details:lastName', 'LastName87_Modified'
Took 0.0047 seconds
hbase(main):106:0> put 'students', '88', 'details:lastName', 'LastName88_Modified'
Took 0.0047 seconds
hbase(main):107:0> put 'students', '89', 'details:lastName', 'LastName89_Modified'
Took 0.0043 seconds
hbase(main):108:0> put 'students', '90', 'details:lastName', 'LastName90_Modified'
Took 0.0043 seconds
hbase(main):109:0> put 'students', '91', 'details:lastName', 'LastName91_Modified'
Took 0.0057 seconds
hbase(main):110:0> put 'students', '92', 'details:lastName', 'LastName92_Modified'
Took 0.0046 seconds
hbase(main):111:0> put 'students', '93', 'details:lastName', 'LastName93_Modified'
Took 0.0074 seconds
hbase(main):112:0> put 'students', '94', 'details:lastName', 'LastName94_Modified'
Took 0.0068 seconds
hbase(main):113:0> put 'students', '95', 'details:lastName', 'LastName95_Modified'
Took 0.0051 seconds
Hbase(main):114:0> put 'students', '96', 'details:lastName', 'LastName96_Modified'
Took 0.0050 seconds
hbase(main):115:0> put 'students', '97', 'details:lastName', 'LastName97_Modified'
Took 0.0055 seconds
hbase(main):116:0> put 'students', '98', 'details:lastName', 'LastName98_Modified'
Took 0.0054 seconds
Hbase(main):117:0> put 'students', '99', 'details:lastName', 'LastName99_Modified'
Took 0.0054 seconds
hbase(main):118:0> put 'students', '100', 'details:lastName', 'LastName100_Modified'
Took 0.0067 seconds
hbase(main):119:0> get 'students', '80'
COLUMN                                CELL
details:firstName                         timestamp=2024-04-21T16:13:56.093, value=Student80

```

- Bulk Delete (issues with loop)

```

hbase(main):120:0> (90..100).each do |i|
hbase(main):121:i>   puts "deleteall 'students', '#{i}'"
hbase(main):122:i> end
deleteall 'students', '99'
deleteall 'students', '91'
deleteall 'students', '92'
deleteall 'students', '93'
deleteall 'students', '94'
deleteall 'students', '95'
deleteall 'students', '96'
deleteall 'students', '97'
deleteall 'students', '98'
deleteall 'students', '99'
deleteall 'students', '100'
=> 90..100
hbase(main):123:0> get 'students', '98'
COLUMN          CELL
details:firstName      timestamp=2024-04-21T16:13:56.189, value=Student98
details:lastName       timestamp=2024-04-21T16:56:19.305, value=LastName98_Modified
1 row(s)
Took 0.0085 seconds
hbase(main):124:0> deleteall 'students', '98'
Took 0.0106 seconds
hbase(main):125:0> deleteall 'students', '91'
Took 0.0052 seconds
hbase(main):126:0> deleteall 'students', '92'
Took 0.0055 seconds
hbase(main):127:0> deleteall 'students', '93'
Took 0.0045 seconds
hbase(main):128:0> deleteall 'students', '94'
Took 0.0048 seconds
hbase(main):129:0> deleteall 'students', '95'
Took 0.0048 seconds
hbase(main):130:0> deleteall 'students', '96'
Took 0.0048 seconds
hbase(main):131:0> deleteall 'students', '97'
Took 0.0055 seconds
hbase(main):132:0> deleteall 'students', '98'
Took 0.0058 seconds
hbase(main):133:0> deleteall 'students', '99'
Took 0.0042 seconds
hbase(main):134:0> deleteall 'students', '100'
Took 0.0042 seconds
hbase(main):135:0> get 'students', '98'
COLUMN          CELL
0 row(s)
Took 0.0077 seconds
hbase(main):136:0> 

```

- Data Retrieval

```

hbase(main):136:0> get 'students', '40'
COLUMN          CELL
details:firstName      timestamp=2024-04-21T16:42:44.939, value=Scholar40
details:lastName       timestamp=2024-04-21T16:13:05.698, value=LastName40
1 row(s)
Took 0.0183 seconds
hbase(main):137:0> get 'students', '60'
COLUMN          CELL
details:firstName      timestamp=2024-04-21T16:13:55.891, value=Student60
details:lastName       timestamp=2024-04-21T16:13:55.898, value=LastName60
details:middleName     timestamp=2024-04-21T16:54:00.926, value=MidName60
1 row(s)
Took 0.0070 seconds
hbase(main):138:0> get 'students', '80'
COLUMN          CELL
details:firstName      timestamp=2024-04-21T16:13:56.093, value=Student80
details:lastName       timestamp=2024-04-21T16:56:19.068, value=LastName80_Modified
1 row(s)
Took 0.0069 seconds
hbase(main):139:0> get 'students', '90'
COLUMN          CELL
0 row(s)
Took 0.0060 seconds
hbase(main):140:0> 

```

- Scan table.

