

## Monica Santana – Exercise 6

Table creation command / list command / adding data to the table / querying the data using get

Creating another table called “orders” / adding data to that table / querying the data using scan

```
santanamonica@dscbigdata: ~/dsc650-infra/bellevue-bigdata/hadoop-hive-spark-hbase
$ docker-compose exec master bash
bash-5.04 hbase shell
2024-07-14 17:15:13,330 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, r7414579f2620fca6b75146c29ab2726fc4643ac9, Wed Jul 28 22:24:42 UTC
2021
Took 0.0035 seconds
hbase(main):001:0> create 'students', 'details'
Created table students
Took 1.5214 seconds
-> Hbase::Table => students
hbase(main):002:0> list
TABLE
students
1 row(s)
Took 0.0382 seconds
=> ['students']
hbase(main):003:0> put 'students', '1', 'details:firstName', 'John'
Took 0.3241 seconds
hbase(main):004:0> put 'students', '1', 'details:lastName', 'Doe'
Took 0.0089 seconds
hbase(main):005:0> get 'students', '1'
COLUMN CELL
details:firstName timestamp=2024-07-14T17:16:15.529, value=John
details:lastName timestamp=2024-07-14T17:16:24.272, value=Doe
1 row(s)
Took 0.0923 seconds
hbase(main):006:0> create 'orders', 'orderDetails'
Created table orders
Took 1.1649 seconds
-> Hbase::Table => orders
hbase(main):007:0> put 'orders', '101:20230806', 'orderDetails:item', 'Laptop'
Took 0.1108 seconds
hbase(main):008:0> put 'orders', '102:20230806', 'orderDetails:item', 'Smartphone'
Took 0.0364 seconds
hbase(main):009:0> scan 'orders', {STARTROW => '101:', ENDROW => '101:~'}
ROW COLUMN+CELL
101:20230806 column=orderDetails:item, timestamp=2024-07-14T17:18:07.774, value=Laptop
1 row(s)
Took 0.1330 seconds
hbase(main):010:0> (2..100).each do |i|
hbase(main):011:1> first_name = "Student#{i}"
hbase(main):012:1> last_name = "LastName#{i}"
hbase(main):013:1> put 'students', "#{i}", 'details:firstName', first_name
hbase(main):014:1> put 'students', "#{i}", 'details:lastName', last_name
hbase(main):015:1> end
Took 0.9549 seconds
Took 0.0075 seconds
Took 0.0082 seconds
Took 0.0074 seconds
Took 0.0071 seconds
Took 0.0068 seconds
Took 0.0080 seconds
```

Last code above is to generate random data for the “students” table and the output shown below:

### CODE from word doc:

(2..100).each do |i|

first\_name = "Student#{i}"

last\_name = "LastName#{i}"

put 'students', "#{i}", 'details:firstName', first\_name

put 'students', "#{i}", 'details:lastName', last\_name

end

```
santanamonica@dscbigdata: ~/dsc650-infra/bellevue-bigdata/hadoop-hive-spark-hbase

Took 0.0051 seconds
Took 0.0042 seconds
Took 0.0047 seconds
Took 0.0045 seconds
Took 0.0045 seconds
Took 0.0051 seconds
Took 0.0049 seconds
Took 0.0046 seconds
Took 0.0057 seconds
Took 0.0049 seconds
Took 0.0047 seconds
Took 0.0085 seconds
Took 0.0063 seconds
Took 0.0056 seconds
Took 0.0076 seconds
Took 0.0052 seconds
Took 0.0054 seconds
Took 0.0059 seconds
Took 0.0064 seconds
Took 0.0053 seconds
Took 0.0082 seconds
Took 0.0046 seconds
Took 0.0043 seconds
Took 0.0055 seconds
Took 0.0061 seconds
Took 0.0043 seconds
Took 0.0043 seconds
Took 0.0061 seconds
> 2.100
hbase (main):016:0> scan 'students'

COLUMN=CELL
ROW
1 column=details:firstName, timestamp=2024-07-14T17:16:15.529, value=John
1 column=details:lastName, timestamp=2024-07-14T17:16:24.272, value=Doc
10 column=details:firstName, timestamp=2024-07-14T17:20:00.901, value=Student10
10 column=details:lastName, timestamp=2024-07-14T17:20:00.989, value=LastName10
100 column=details:firstName, timestamp=2024-07-14T17:20:02.399, value=Student100
100 column=details:lastName, timestamp=2024-07-14T17:20:02.405, value=LastName100
110 column=details:firstName, timestamp=2024-07-14T17:20:00.998, value=Student111
11 column=details:lastName, timestamp=2024-07-14T17:20:01.007, value=LastName11
12 column=details:firstName, timestamp=2024-07-14T17:20:01.016, value=Student112
12 column=details:lastName, timestamp=2024-07-14T17:20:01.025, value=LastName12
13 column=details:firstName, timestamp=2024-07-14T17:20:01.035, value=Student113
13 column=details:lastName, timestamp=2024-07-14T17:20:01.045, value=LastName13
14 column=details:firstName, timestamp=2024-07-14T17:20:01.060, value=Student114
14 column=details:lastName, timestamp=2024-07-14T17:20:01.070, value=LastName14
15 column=details:firstName, timestamp=2024-07-14T17:20:01.080, value=Student115
15 column=details:lastName, timestamp=2024-07-14T17:20:01.089, value=LastName15
16 column=details:firstName, timestamp=2024-07-14T17:20:01.098, value=Student116
16 column=details:lastName, timestamp=2024-07-14T17:20:01.115, value=LastName16
17 column=details:firstName, timestamp=2024-07-14T17:20:01.126, value=Student117
17 column=details:lastName, timestamp=2024-07-14T17:20:01.138, value=LastName17
18 column=details:firstName, timestamp=2024-07-14T17:20:01.145, value=Student118
18 column=details:lastName, timestamp=2024-07-14T17:20:01.160, value=LastName18
19 column=details:firstName, timestamp=2024-07-14T17:20:01.170, value=Student119
19 column=details:lastName, timestamp=2024-07-14T17:20:01.180, value=LastName19
2 column=details:firstName, timestamp=2024-07-14T17:20:00.800, value=Student2
20 column=details:lastName, timestamp=2024-07-14T17:20:00.817, value=LastName2
20 column=details:firstName, timestamp=2024-07-14T17:20:01.189, value=Student20
20 column=details:lastName, timestamp=2024-07-14T17:20:01.199, value=LastName20
```

```
santanamonica@dscbigdata: ~/dsc650-infra/bellevue-bigdata/hadoop-hive-spark-hbase

21 column=details:firstName, timestamp=2024-07-14T17:20:01.208, value=Student21
21 column=details:lastName, timestamp=2024-07-14T17:20:01.218, value=LastName21
22 column=details:firstName, timestamp=2024-07-14T17:20:01.231, value=Student22
22 column=details:lastName, timestamp=2024-07-14T17:20:01.240, value=LastName22
23 column=details:firstName, timestamp=2024-07-14T17:20:01.261, value=Student23
23 column=details:lastName, timestamp=2024-07-14T17:20:01.276, value=LastName23
24 column=details:firstName, timestamp=2024-07-14T17:20:01.288, value=Student24
24 column=details:lastName, timestamp=2024-07-14T17:20:01.307, value=LastName24
25 column=details:firstName, timestamp=2024-07-14T17:20:01.317, value=Student25
25 column=details:lastName, timestamp=2024-07-14T17:20:01.325, value=LastName25
26 column=details:firstName, timestamp=2024-07-14T17:20:01.333, value=Student26
26 column=details:lastName, timestamp=2024-07-14T17:20:01.343, value=LastName26
27 column=details:firstName, timestamp=2024-07-14T17:20:01.351, value=Student27
27 column=details:lastName, timestamp=2024-07-14T17:20:01.359, value=LastName27
28 column=details:firstName, timestamp=2024-07-14T17:20:01.368, value=Student28
28 column=details:lastName, timestamp=2024-07-14T17:20:01.383, value=LastName28
29 column=details:firstName, timestamp=2024-07-14T17:20:01.397, value=Student29
29 column=details:lastName, timestamp=2024-07-14T17:20:01.409, value=LastName29
3 column=details:firstName, timestamp=2024-07-14T17:20:00.826, value=Student3
3 column=details:lastName, timestamp=2024-07-14T17:20:00.836, value=LastName3
30 column=details:firstName, timestamp=2024-07-14T17:20:01.419, value=Student30
30 column=details:lastName, timestamp=2024-07-14T17:20:01.428, value=LastName30
31 column=details:firstName, timestamp=2024-07-14T17:20:01.439, value=Student31
31 column=details:lastName, timestamp=2024-07-14T17:20:01.451, value=LastName31
32 column=details:firstName, timestamp=2024-07-14T17:20:01.463, value=Student32
32 column=details:lastName, timestamp=2024-07-14T17:20:01.472, value=LastName32
33 column=details:firstName, timestamp=2024-07-14T17:20:01.497, value=Student33
33 column=details:lastName, timestamp=2024-07-14T17:20:01.512, value=LastName33
34 column=details:firstName, timestamp=2024-07-14T17:20:01.520, value=Student34
34 column=details:lastName, timestamp=2024-07-14T17:20:01.527, value=LastName34
35 column=details:firstName, timestamp=2024-07-14T17:20:01.534, value=Student35
35 column=details:lastName, timestamp=2024-07-14T17:20:01.541, value=LastName35
36 column=details:firstName, timestamp=2024-07-14T17:20:01.549, value=Student36
36 column=details:lastName, timestamp=2024-07-14T17:20:01.566, value=LastName36
37 column=details:firstName, timestamp=2024-07-14T17:20:01.562, value=Student37
37 column=details:lastName, timestamp=2024-07-14T17:20:01.569, value=LastName37
38 column=details:firstName, timestamp=2024-07-14T17:20:01.575, value=Student38
38 column=details:lastName, timestamp=2024-07-14T17:20:01.582, value=LastName38
39 column=details:firstName, timestamp=2024-07-14T17:20:01.588, value=Student39
39 column=details:lastName, timestamp=2024-07-14T17:20:01.595, value=LastName39
4 column=details:firstName, timestamp=2024-07-14T17:20:00.845, value=Student4
4 column=details:lastName, timestamp=2024-07-14T17:20:00.854, value=LastName4
40 column=details:firstName, timestamp=2024-07-14T17:20:01.602, value=Student40
40 column=details:lastName, timestamp=2024-07-14T17:20:01.608, value=LastName40
41 column=details:firstName, timestamp=2024-07-14T17:20:01.614, value=Student41
41 column=details:lastName, timestamp=2024-07-14T17:20:01.621, value=LastName41
42 column=details:firstName, timestamp=2024-07-14T17:20:01.629, value=Student42
42 column=details:lastName, timestamp=2024-07-14T17:20:01.635, value=LastName42
43 column=details:firstName, timestamp=2024-07-14T17:20:01.643, value=Student43
43 column=details:lastName, timestamp=2024-07-14T17:20:01.649, value=LastName43
44 column=details:firstName, timestamp=2024-07-14T17:20:01.656, value=Student44
44 column=details:lastName, timestamp=2024-07-14T17:20:01.662, value=LastName44
45 column=details:firstName, timestamp=2024-07-14T17:20:01.669, value=Student45
45 column=details:lastName, timestamp=2024-07-14T17:20:01.675, value=LastName45
46 column=details:firstName, timestamp=2024-07-14T17:20:01.682, value=Student46
46 column=details:lastName, timestamp=2024-07-14T17:20:01.689, value=LastName46
47 column=details:firstName, timestamp=2024-07-14T17:20:01.696, value=Student47
47 column=details:lastName, timestamp=2024-07-14T17:20:01.703, value=LastName47
48 column=details:firstName, timestamp=2024-07-14T17:20:01.710, value=Student48
```



## HBase Data Manipulation

### 1. Update First Names:

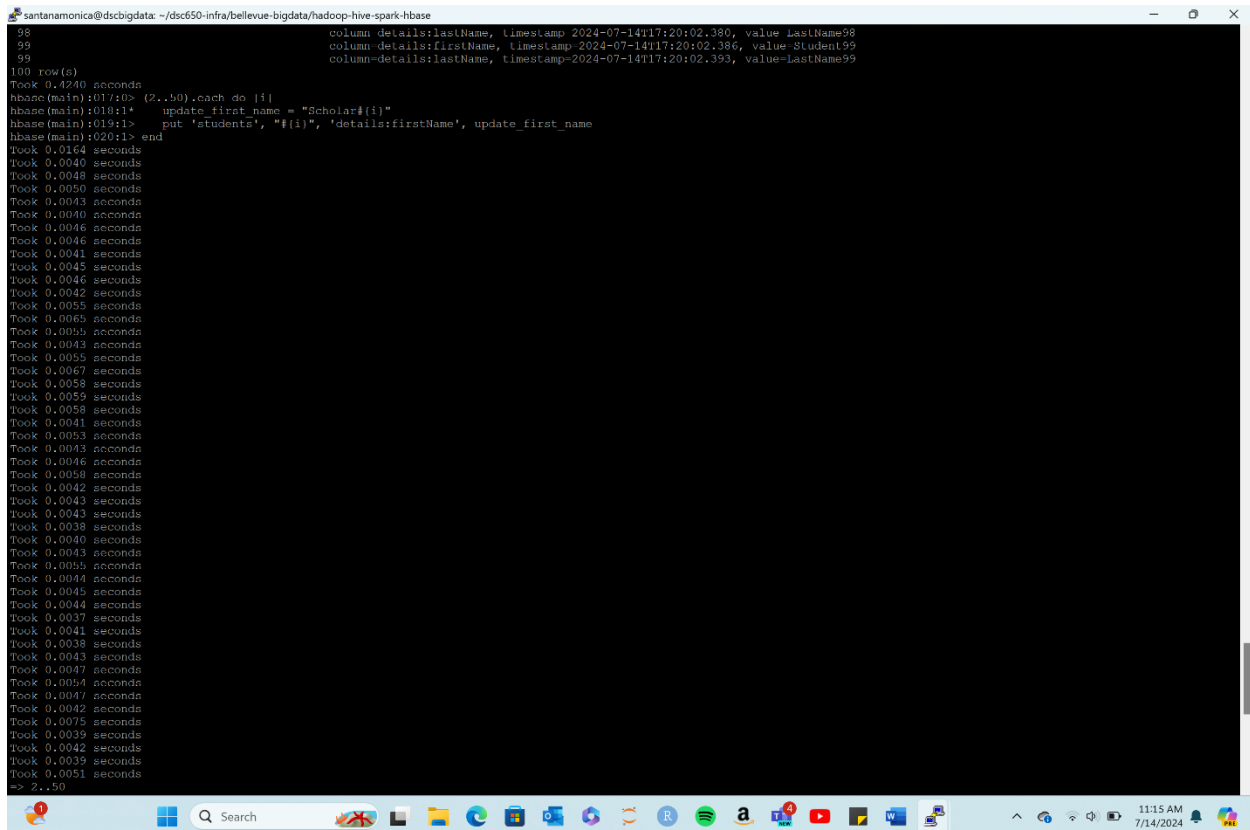
- For students with IDs from 2 to 50, change the first name prefix from Student to Scholar. For instance, Student3 should become Scholar3.

#### CODE:

```
(2..50).each do |i|
  update_first_name = "Scholar#{i}"
  put 'students', "#{i}", 'details:firstName', update_first_name
end
```

#### CODE OUTPUT:

```
scan 'students', {STARTROW => '2:', ENDROW => '51:~'}
```



The screenshot shows a terminal window with the following content:

```
santanemonica@dscbigdata: ~/dsc650-infra/bellevue-bigdata/hadoop-hive-spark-hbase
98      column details:lastName, timestamp=2024-07-14T17:20:02.386, value=LastName98
99      column details:firstName, timestamp=2024-07-14T17:20:02.386, value=Student99
100 row(s)
Took 0.4240 seconds
hbase(main):017:0> (2..50).each do |i|
hbase(main):018:1>   update_first_name = "Scholar#{i}"
hbase(main):019:1>   put 'students', "#{i}", 'details:firstName', update_first_name
hbase(main):020:1> end
Took 0.0164 seconds
Took 0.0040 seconds
Took 0.0048 seconds
Took 0.0050 seconds
Took 0.0043 seconds
Took 0.0040 seconds
Took 0.0046 seconds
Took 0.0046 seconds
Took 0.0041 seconds
Took 0.0045 seconds
Took 0.0046 seconds
Took 0.0042 seconds
Took 0.0055 seconds
Took 0.0065 seconds
Took 0.0055 seconds
Took 0.0043 seconds
Took 0.0055 seconds
Took 0.0067 seconds
Took 0.0058 seconds
Took 0.0059 seconds
Took 0.0058 seconds
Took 0.0041 seconds
Took 0.0053 seconds
Took 0.0043 seconds
Took 0.0046 seconds
Took 0.0050 seconds
Took 0.0042 seconds
Took 0.0043 seconds
Took 0.0043 seconds
Took 0.0038 seconds
Took 0.0040 seconds
Took 0.0043 seconds
Took 0.0055 seconds
Took 0.0044 seconds
Took 0.0045 seconds
Took 0.0044 seconds
Took 0.0037 seconds
Took 0.0041 seconds
Took 0.0038 seconds
Took 0.0043 seconds
Took 0.0047 seconds
Took 0.0054 seconds
Took 0.0047 seconds
Took 0.0042 seconds
Took 0.0075 seconds
Took 0.0039 seconds
Took 0.0042 seconds
Took 0.0039 seconds
Took 0.0051 seconds
=> 2..50
```



```
santanamonica@dscbigdata: ~/dsc650-infra/bellevue-bigdata/hadoop-hive-spark-hbase
Took 0.0042 seconds
Took 0.0039 seconds
Took 0.0051 seconds
> 2..50
hbase(main):02110> scan 'students', {STARTROW => '2:', ENDROW => '51:~'}
COLUMN=CFID
ROW
3 column=details:firstName, timestamp=2024-07-14T18:11:28.134, value=Scholar3
3 column=details:lastName, timestamp=2024-07-14T17:20:00.836, value=LastName3
30 column=details:firstName, timestamp=2024-07-14T18:11:28.296, value=Scholar30
30 column=details:lastName, timestamp=2024-07-14T17:20:01.428, value=LastName30
31 column=details:firstName, timestamp=2024-07-14T18:11:28.301, value=Scholar31
31 column=details:lastName, timestamp=2024-07-14T17:20:01.451, value=LastName31
32 column=details:firstName, timestamp=2024-07-14T18:11:28.306, value=Scholar32
32 column=details:lastName, timestamp=2024-07-14T17:20:01.472, value=LastName32
33 column=details:firstName, timestamp=2024-07-14T18:11:28.311, value=Scholar33
33 column=details:lastName, timestamp=2024-07-14T17:20:01.512, value=LastName33
34 column=details:firstName, timestamp=2024-07-14T18:11:28.317, value=Scholar34
34 column=details:lastName, timestamp=2024-07-14T17:20:01.527, value=LastName34
35 column=details:firstName, timestamp=2024-07-14T18:11:28.323, value=Scholar35
35 column=details:lastName, timestamp=2024-07-14T17:20:01.541, value=LastName35
36 column=details:firstName, timestamp=2024-07-14T18:11:28.328, value=Scholar36
36 column=details:lastName, timestamp=2024-07-14T17:20:01.556, value=LastName36
37 column=details:firstName, timestamp=2024-07-14T18:11:28.334, value=Scholar37
37 column=details:lastName, timestamp=2024-07-14T17:20:01.569, value=LastName37
38 column=details:firstName, timestamp=2024-07-14T18:11:28.339, value=Scholar38
38 column=details:lastName, timestamp=2024-07-14T17:20:01.582, value=LastName38
39 column=details:firstName, timestamp=2024-07-14T18:11:28.344, value=Scholar39
39 column=details:lastName, timestamp=2024-07-14T17:20:01.595, value=LastName39
4 column=details:firstName, timestamp=2024-07-14T18:11:28.139, value=Scholar4
4 column=details:lastName, timestamp=2024-07-14T17:20:00.854, value=LastName4
40 column=details:firstName, timestamp=2024-07-14T18:11:28.348, value=Scholar40
40 column=details:lastName, timestamp=2024-07-14T17:20:01.608, value=LastName40
41 column=details:firstName, timestamp=2024-07-14T18:11:28.353, value=Scholar41
41 column=details:lastName, timestamp=2024-07-14T17:20:01.621, value=LastName41
42 column=details:firstName, timestamp=2024-07-14T18:11:28.359, value=Scholar42
42 column=details:lastName, timestamp=2024-07-14T17:20:01.635, value=LastName42
43 column=details:firstName, timestamp=2024-07-14T18:11:28.364, value=Scholar43
43 column=details:lastName, timestamp=2024-07-14T17:20:01.645, value=LastName43
44 column=details:firstName, timestamp=2024-07-14T18:11:28.371, value=Scholar44
44 column=details:lastName, timestamp=2024-07-14T17:20:01.662, value=LastName44
45 column=details:firstName, timestamp=2024-07-14T18:11:28.377, value=Scholar45
45 column=details:lastName, timestamp=2024-07-14T17:20:01.676, value=LastName45
46 column=details:firstName, timestamp=2024-07-14T18:11:28.384, value=Scholar46
46 column=details:lastName, timestamp=2024-07-14T17:20:01.689, value=LastName46
47 column=details:firstName, timestamp=2024-07-14T18:11:28.390, value=Scholar47
47 column=details:lastName, timestamp=2024-07-14T17:20:01.703, value=LastName47
48 column=details:firstName, timestamp=2024-07-14T18:11:28.395, value=Scholar48
48 column=details:lastName, timestamp=2024-07-14T17:20:01.717, value=LastName48
49 column=details:firstName, timestamp=2024-07-14T18:11:28.400, value=Scholar49
49 column=details:lastName, timestamp=2024-07-14T17:20:01.729, value=LastName49
5 column=details:firstName, timestamp=2024-07-14T18:11:28.145, value=Scholar5
5 column=details:lastName, timestamp=2024-07-14T17:20:00.877, value=LastName5
50 column=details:firstName, timestamp=2024-07-14T18:11:28.406, value=Scholar50
50 column=details:lastName, timestamp=2024-07-14T17:20:01.741, value=LastName50
51 column=details:firstName, timestamp=2024-07-14T17:20:01.747, value=Student51
51 column=details:lastName, timestamp=2024-07-14T17:20:01.753, value=LastName51
25 row(s)
Took 0.0638 seconds
hbase(main):02210>
```

## 2. Add a Middle Name:

- For students with IDs from 51 to 75, add a middle name column under the details column family. The middle name should follow the pattern MidName#{i}.

### CODE:

```
(51..75).each do |i|
  middle_name = "MidName#{i}"
  put 'students', "#{i}", 'details:middleName', middle_name
end
```

### CODE OUTPUT:

```
scan 'students', {STARTROW => '50:', ENDROW => '75:~'}
```

```
santanamonica@dscbigdata: ~/dsc650-infra/bellevue-bigdata/hadoop-hive-spark-hbase
hbase(main):022:0> (51..75).each do |i|
hbase(main):023:1+ middle_name = "MidName#{i}"
hbase(main):024:1> put 'students', "#{i}", 'details:middleName', middle_name
hbase(main):025:1> end
Took 0.0180 seconds
Took 0.0050 seconds
Took 0.0053 seconds
Took 0.0070 seconds
Took 0.0049 seconds
Took 0.0044 seconds
Took 0.0060 seconds
Took 0.0043 seconds
Took 0.0044 seconds
Took 0.0041 seconds
Took 0.0042 seconds
Took 0.0055 seconds
Took 0.0051 seconds
Took 0.0046 seconds
Took 0.0051 seconds
Took 0.0047 seconds
Took 0.0042 seconds
Took 0.0042 seconds
Took 0.0072 seconds
Took 0.0044 seconds
Took 0.0038 seconds
Took 0.0038 seconds
Took 0.0036 seconds
Took 0.0033 seconds
Took 0.0033 seconds
=> 51.75
hbase(main):026:0> scan 'students', {STARTROW => '50:', ENDROW => '75:~'}
ROW
COLUMN+CELL
51 column=details:firstName, timestamp=2024-07-14T17:20:01.74
7, value=Student51
column=details:lastName, timestamp=2024-07-14T17:20:01.753
, value=LastName51
column=details:middleName, timestamp=2024-07-14T18:22:03.0
85, value=MidName51
52 column=details:firstName, timestamp=2024-07-14T17:20:01.75
9, value=Student52
column=details:lastName, timestamp=2024-07-14T17:20:01.766
, value=LastName52
column=details:middleName, timestamp=2024-07-14T18:22:03.0
95, value=MidName52
53 column=details:firstName, timestamp=2024-07-14T17:20:01.77
3, value=Student53
column=details:lastName, timestamp=2024-07-14T17:20:01.780
, value=LastName53
column=details:middleName, timestamp=2024-07-14T18:22:03.1
01, value=MidName53
54 column=details:firstName, timestamp=2024-07-14T17:20:01.78
5, value=Student54
column=details:lastName, timestamp=2024-07-14T17:20:01.791
, value=LastName54
column=details:middleName, timestamp=2024-07-14T18:22:03.1
09, value=MidName54
55 column=details:firstName, timestamp=2024-07-14T17:20:01.79
7, value=Student55
column=details:lastName, timestamp=2024-07-14T17:20:01.804
```

```
santanamonica@dscbigdata: ~/dsc650-infra/bellevue-bigdata/hadoop-hive-spark-hbase
55 column=details:middleName, timestamp=2024-07-14T18:22:03.1
16, value=MidName55
column=details:firstName, timestamp=2024-07-14T17:20:01.81
0, value=Student56
column=details:lastName, timestamp=2024-07-14T17:20:01.822
, value=LastName56
column=details:middleName, timestamp=2024-07-14T18:22:03.1
21, value=MidName56
57 column=details:firstName, timestamp=2024-07-14T17:20:01.82
9, value=Student57
column=details:lastName, timestamp=2024-07-14T17:20:01.836
, value=LastName57
column=details:middleName, timestamp=2024-07-14T18:22:03.1
27, value=MidName57
58 column=details:firstName, timestamp=2024-07-14T17:20:01.84
1, value=Student58
column=details:lastName, timestamp=2024-07-14T17:20:01.848
, value=LastName58
column=details:middleName, timestamp=2024-07-14T18:22:03.1
35, value=MidName58
59 column=details:firstName, timestamp=2024-07-14T17:20:01.85
4, value=Student59
column=details:lastName, timestamp=2024-07-14T17:20:01.861
, value=LastName59
column=details:middleName, timestamp=2024-07-14T18:22:03.1
41, value=MidName59
6 column=details:firstName, timestamp=2024-07-14T18:11:28.15
3, value=Student6
column=details:lastName, timestamp=2024-07-14T17:20:00.896
, value=LastName6
60 column=details:firstName, timestamp=2024-07-14T17:20:01.86
7, value=Student60
column=details:lastName, timestamp=2024-07-14T17:20:01.874
, value=LastName60
column=details:middleName, timestamp=2024-07-14T18:22:03.1
48, value=MidName60
61 column=details:firstName, timestamp=2024-07-14T17:20:01.88
1, value=Student61
column=details:lastName, timestamp=2024-07-14T17:20:01.892
, value=LastName61
column=details:middleName, timestamp=2024-07-14T18:22:03.1
54, value=MidName61
62 column=details:firstName, timestamp=2024-07-14T17:20:01.89
9, value=Student62
column=details:lastName, timestamp=2024-07-14T17:20:01.906
, value=LastName62
column=details:middleName, timestamp=2024-07-14T18:22:03.1
60, value=MidName62
63 column=details:firstName, timestamp=2024-07-14T17:20:01.91
4, value=Student63
column=details:lastName, timestamp=2024-07-14T17:20:01.921
, value=LastName63
column=details:middleName, timestamp=2024-07-14T18:22:03.1
68, value=MidName63
64 column=details:firstName, timestamp=2024-07-14T17:20:01.92
9, value=Student64
column=details:lastName, timestamp=2024-07-14T17:20:01.936
, value=LastName64
64 column=details:middleName, timestamp=2024-07-14T18:22:03.1
```

```
santanamonica@dscbigdata: ~/dsc650-infra/bellevue-bigdata/hadoop-hive-spark-hbase
67      , value=LastName67
67      column=details:middleName, timestamp=2024-07-14T18:22:03.1
67      95, value=MidName67
68      column=details:firstName, timestamp=2024-07-14T17:20:01.98
68      1, value=Student68
68      column=details:lastName, timestamp=2024-07-14T17:20:01.988
68      , value=LastName68
68      column=details:middleName, timestamp=2024-07-14T18:22:03.2
68      00, value=MidName68
69      column=details:firstName, timestamp=2024-07-14T17:20:01.99
69      5, value=Student69
69      column=details:lastName, timestamp=2024-07-14T17:20:02.001
69      , value=LastName69
69      column=details:middleName, timestamp=2024-07-14T18:22:03.2
69      06, value=MidName69
7      column=details:firstName, timestamp=2024-07-14T18:11:28.15
7      7, value=Scholar7
7      column=details:lastName, timestamp=2024-07-14T17:20:00.932
7      , value=LastName7
70      column=details:firstName, timestamp=2024-07-14T17:20:02.00
70      8, value=Student70
70      column=details:lastName, timestamp=2024-07-14T17:20:02.015
70      , value=LastName70
70      column=details:middleName, timestamp=2024-07-14T18:22:03.2
70      13, value=MidName70
71      column=details:firstName, timestamp=2024-07-14T17:20:02.02
71      2, value=Student71
71      column=details:lastName, timestamp=2024-07-14T17:20:02.028
71      , value=LastName71
71      column=details:middleName, timestamp=2024-07-14T18:22:03.2
71      19, value=MidName71
72      column=details:firstName, timestamp=2024-07-14T17:20:02.03
72      4, value=Student72
72      column=details:lastName, timestamp=2024-07-14T17:20:02.041
72      , value=LastName72
72      column=details:middleName, timestamp=2024-07-14T18:22:03.2
72      23, value=MidName72
73      column=details:firstName, timestamp=2024-07-14T17:20:02.04
73      7, value=Student73
73      column=details:lastName, timestamp=2024-07-14T17:20:02.054
73      , value=LastName73
73      column=details:middleName, timestamp=2024-07-14T18:22:03.2
73      28, value=MidName73
74      column=details:firstName, timestamp=2024-07-14T17:20:02.06
74      0, value=Student74
74      column=details:lastName, timestamp=2024-07-14T17:20:02.067
74      , value=LastName74
74      column=details:middleName, timestamp=2024-07-14T18:22:03.2
74      32, value=MidName74
75      column=details:firstName, timestamp=2024-07-14T17:20:02.07
75      3, value=Student75
75      column=details:lastName, timestamp=2024-07-14T17:20:02.080
75      , value=LastName75
75      column=details:middleName, timestamp=2024-07-14T18:22:03.2
75      36, value=MidName75
27 row(s)
Took 0.1824 seconds
hbase(main):027:0>
hbase(main):028:0>
```

### 3. Modify Last Names:

- For students with IDs from 76 to 100, append `_Modified` to the last name. So, `LastName76` should be updated to `LastName76_Modified`.

#### CODE:

```
(76..100).each do |i|
  modified_last_names = "LastName#{i}_Modified"
  put 'students', "#{i}", 'details:lastName', modified_last_names
end
```

#### CODE OUTPUT:

```
get 'students', '80'
get 'students', '77'
get 'students', '90'
get 'students', '100'
get 'students', '75'
```

```
santanamonica@dscbigdata: ~/dsc650-infra/bellevue-bigdata/hadoop-hive-spark-hbase
hbase(main):052:0> (76..100).each do |i|
hbase(main):053:1+   modified_last_names = "LastName#{i} Modified"
hbase(main):054:1>   put 'students', "#{i}", 'details:lastName', modified_last_names
hbase(main):055:1> end
Took 0.0041 seconds
Took 0.0045 seconds
Took 0.0038 seconds
Took 0.0037 seconds
Took 0.0035 seconds
Took 0.0034 seconds
Took 0.0039 seconds
Took 0.0036 seconds
Took 0.0036 seconds
Took 0.0032 seconds
Took 0.0034 seconds
Took 0.0033 seconds
Took 0.0037 seconds
Took 0.0035 seconds
Took 0.0035 seconds
Took 0.0035 seconds
Took 0.0034 seconds
Took 0.0038 seconds
Took 0.0036 seconds
Took 0.0034 seconds
Took 0.0035 seconds
Took 0.0036 seconds
Took 0.0042 seconds
Took 0.0036 seconds
Took 0.0034 seconds
=> 76..100
hbase(main):056:0> get 'students', '80'
COLUMN                                CELL
details:firstName                     timestamp=2024-07-14T19:17:50.102, value=Student80
details:lastName                       timestamp=2024-07-14T19:31:20.701, value=LastName80_Modified
1 row(s)
Took 0.0106 seconds
hbase(main):057:0> get 'students', '77'
COLUMN                                CELL
details:firstName                     timestamp=2024-07-14T19:17:50.062, value=Student77
details:lastName                       timestamp=2024-07-14T19:31:20.687, value=LastName77_Modified
1 row(s)
Took 0.0095 seconds
hbase(main):058:0> get 'students', '90'
COLUMN                                CELL
details:firstName                     timestamp=2024-07-14T19:17:50.231, value=Student90
details:lastName                       timestamp=2024-07-14T19:31:20.743, value=LastName90_Modified
1 row(s)
Took 0.0105 seconds
hbase(main):059:0> get 'students', '100'
COLUMN                                CELL
details:firstName                     timestamp=2024-07-14T19:17:50.359, value=Student100
details:lastName                       timestamp=2024-07-14T19:31:20.788, value=LastName100_Modified
1 row(s)
Took 0.0074 seconds
hbase(main):060:0> get 'students', '75'
COLUMN                                CELL
details:firstName                     timestamp=2024-07-14T19:17:50.039, value=Student75
details:lastName                       timestamp=2024-07-14T19:31:16.751, value=LastName75
details:middleName
```

#### 4. Bulk Delete:

- Delete all the details for students with IDs from 90 to 100.

#### CODE:

```
(90..100).each do |i|
  deleteall 'students', "#{i}"
end
```

#### CODE OUTPUT:

```
scan 'students', {STARTROW => '89:', ENDROW => '100:~'}
get 'students', '90'
get 'students', '95'
get 'students', '100'
```



## 5. Data Retrieval:

- After all modifications, retrieve and display the details for students with IDs 40, 60, 80, and 90 to verify changes.

### CODE OUTPUT:

```
get 'students', '40'  
get 'students', '60'  
get 'students', '80'  
get 'students', '90'
```

```
santanamonica@dscbigdata: ~/dsc650-infra/bellevue-bigdata/hadoop-hive-spark-hbase  
details:lastName timestamp=2024-07-14T19:17:50.044, value=LastName75  
details:middleName timestamp=2024-07-14T19:19:16.751, value=MidName75  
1 row(s)  
Took 0.0114 seconds  
hbase(main):061:10> (90,100).each do |i|  
hbase(main):062:11* deleteall 'students', "#{i}"  
hbase(main):063:11> end  
Took 0.0091 seconds  
Took 0.0036 seconds  
Took 0.0034 seconds  
Took 0.0078 seconds  
Took 0.0037 seconds  
Took 0.0097 seconds  
Took 0.0042 seconds  
Took 0.0041 seconds  
Took 0.0034 seconds  
Took 0.0036 seconds  
Took 0.0036 seconds  
> 90..100  
hbase(main):064:10> scan 'students', {STARTROW => '89;', ENDROW => '100:~'}  
ROW COLUMN+CELL  
0 row(s)  
Took 0.0107 seconds  
hbase(main):065:10> get 'students', '90'  
COLUMN CELL  
0 row(s)  
Took 0.0116 seconds  
hbase(main):066:10> get 'students', '95'  
COLUMN CELL  
0 row(s)  
Took 0.0080 seconds  
hbase(main):067:10> get 'students', '100'  
COLUMN CELL  
0 row(s)  
Took 0.0082 seconds  
hbase(main):068:10> get 'students', '40'  
COLUMN CELL  
details:firstName timestamp=2024-07-14T19:18:41.306, value=Scholar40  
details:lastName timestamp=2024-07-14T19:17:49.556, value=LastName40  
1 row(s)  
Took 0.0099 seconds  
hbase(main):069:10> get 'students', '60'  
COLUMN CELL  
timestamp=2024-07-14T19:17:49.819, value=Student60  
timestamp=2024-07-14T19:17:49.825, value=LastName60  
timestamp=2024-07-14T19:16.683, value=MidName60  
1 row(s)  
Took 0.0092 seconds  
hbase(main):070:10> get 'students', '80'  
COLUMN CELL  
timestamp=2024-07-14T19:17:50.102, value=Student80  
timestamp=2024-07-14T19:31:20.701, value=LastName80_Modified  
1 row(s)  
Took 0.0097 seconds  
hbase(main):071:10> get 'students', '90'  
COLUMN CELL  
0 row(s)  
Took 0.0086 seconds  
hbase(main):072:10>
```