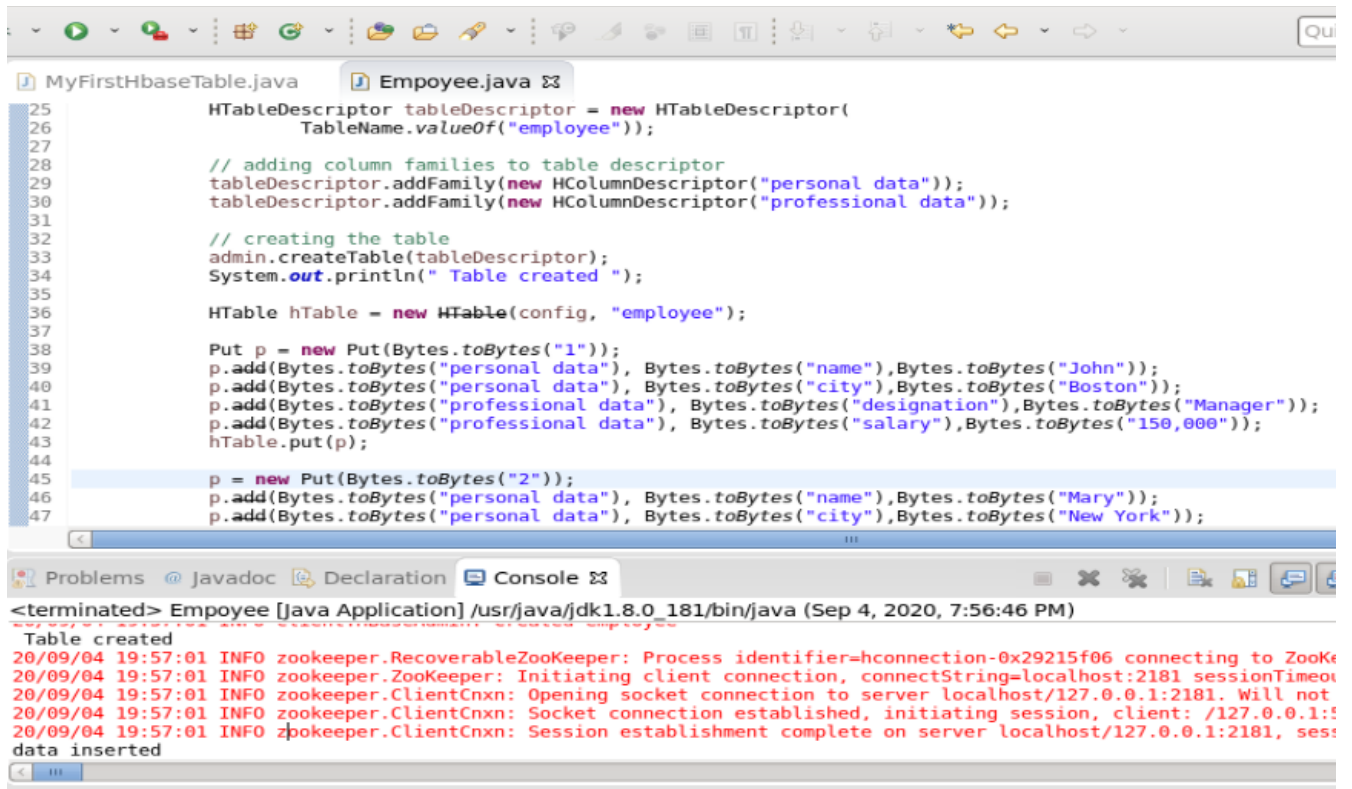


## Lab8 HBase

### -- 1. created table and inserted data



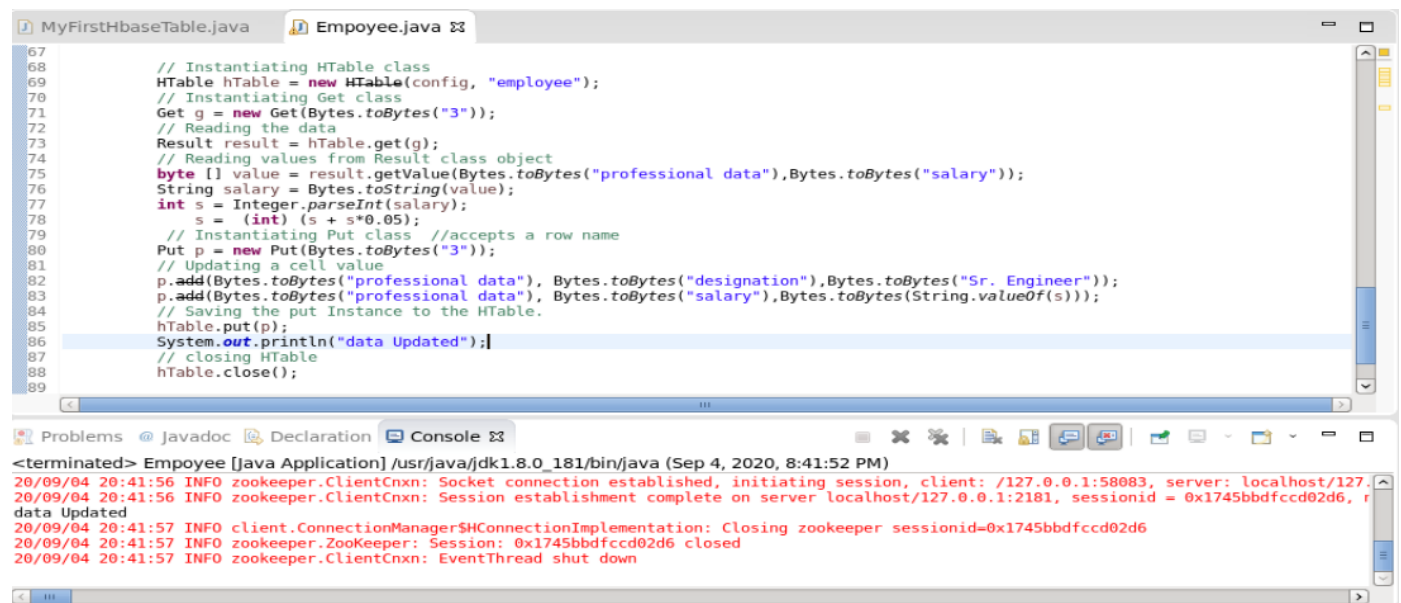
```
MyFirstHbaseTable.java Employee.java
25 HTableDescriptor tableDescriptor = new HTableDescriptor(
26     TableName.valueOf("employee"));
27
28 // adding column families to table descriptor
29 tableDescriptor.addFamily(new HColumnDescriptor("personal data"));
30 tableDescriptor.addFamily(new HColumnDescriptor("professional data"));
31
32 // creating the table
33 admin.createTable(tableDescriptor);
34 System.out.println(" Table created ");
35
36 HTable hTable = new HTable(config, "employee");
37
38 Put p = new Put(Bytes.toBytes("1"));
39 p.add(Bytes.toBytes("personal data"), Bytes.toBytes("name"), Bytes.toBytes("John"));
40 p.add(Bytes.toBytes("personal data"), Bytes.toBytes("city"), Bytes.toBytes("Boston"));
41 p.add(Bytes.toBytes("professional data"), Bytes.toBytes("designation"), Bytes.toBytes("Manager"));
42 p.add(Bytes.toBytes("professional data"), Bytes.toBytes("salary"), Bytes.toBytes("150,000"));
43 hTable.put(p);
44
45 p = new Put(Bytes.toBytes("2"));
46 p.add(Bytes.toBytes("personal data"), Bytes.toBytes("name"), Bytes.toBytes("Mary"));
47 p.add(Bytes.toBytes("personal data"), Bytes.toBytes("city"), Bytes.toBytes("New York"));

Problems Javadoc Declaration Console
<terminated> Employee [Java Application] /usr/java/jdk1.8.0_181/bin/java (Sep 4, 2020, 7:56:46 PM)
Table created
20/09/04 19:57:01 INFO zookeeper.RecoverableZooKeeper: Process identifier=hconnection-0x29215f06 connecting to ZooK
20/09/04 19:57:01 INFO zookeeper.ZooKeeper: Initiating client connection, connectString=localhost:2181 sessionTimeo
20/09/04 19:57:01 INFO zookeeper.ClientCnxn: Opening socket connection to server localhost/127.0.0.1:2181. Will not
20/09/04 19:57:01 INFO zookeeper.ClientCnxn: Socket connection established, initiating session, client: /127.0.0.1:
20/09/04 19:57:01 INFO zookeeper.ClientCnxn: Session establishment complete on server localhost/127.0.0.1:2181, ses
data inserted
```

### -- HBase shell

```
hbase(main):010:0> scan 'employee'
ROW COLUMN+CELL
1 column=personal data:city, timestamp=1599274622692, value=Boston
1 column=personal data:name, timestamp=1599274622692, value=John
1 column=professional data:designation, timestamp=1599274622692, value=Manager
1 column=professional data:salary, timestamp=1599274622692, value=150,000
2 column=personal data:city, timestamp=1599274622802, value=New York
2 column=personal data:name, timestamp=1599274622802, value=Mary
2 column=professional data:designation, timestamp=1599274622802, value=Sr.Engineer
2 column=professional data:salary, timestamp=1599274622802, value=130,000
3 column=personal data:city, timestamp=1599274622811, value=Fremont
3 column=personal data:name, timestamp=1599274622811, value=Bob
3 column=professional data:designation, timestamp=1599274622811, value=Jr. Engineer
3 column=professional data:salary, timestamp=1599274622811, value=90,000
3 row(s) in 0.0490 seconds
```

## -- 2. modify data



The screenshot shows an IDE with two tabs: `MyFirstHbaseTable.java` and `Empoyee.java`. The `Empoyee.java` tab is active, displaying Java code for interacting with HBase. The code includes comments and operations for instantiating HTable, reading data, and updating a cell. The console output at the bottom shows the execution of the program, including ZooKeeper connection logs and a confirmation message "data Updated".

```
67
68 // Instantiating HTable class
69 HTable hTable = new HTable(config, "employee");
70 // Instantiating Get class
71 Get g = new Get(Bytes.toBytes("3"));
72 // Reading the data
73 Result result = hTable.get(g);
74 // Reading values from Result class object
75 byte [] value = result.getValue(Bytes.toBytes("professional data"), Bytes.toBytes("salary"));
76 String salary = Bytes.toString(value);
77 int s = Integer.parseInt(salary);
78 s = (int) (s + s*0.05);
79 // Instantiating Put class //accepts a row name
80 Put p = new Put(Bytes.toBytes("3"));
81 // Updating a cell value
82 p.add(Bytes.toBytes("professional data"), Bytes.toBytes("designation"), Bytes.toBytes("Sr. Engineer"));
83 p.add(Bytes.toBytes("professional data"), Bytes.toBytes("salary"), Bytes.toBytes(String.valueOf(s)));
84 // Saving the put Instance to the HTable.
85 hTable.put(p);
86 System.out.println("data Updated");
87 // closing HTable
88 hTable.close();
89
```

Problems @ Javadoc Declaration Console

```
<terminated> Empoyee [Java Application] /usr/java/jdk1.8.0_181/bin/java (Sep 4, 2020, 8:41:52 PM)
20/09/04 20:41:56 INFO zookeeper.ClientCnxn: Socket connection established, initiating session, client: /127.0.0.1:58083, server: localhost/127.
20/09/04 20:41:56 INFO zookeeper.ClientCnxn: Session establishment complete on server localhost/127.0.0.1:2181, sessionId = 0x1745bbdfccd02d6, r
data Updated
20/09/04 20:41:57 INFO client.ConnectionManager$HConnectionImplementation: Closing zookeeper sessionId=0x1745bbdfccd02d6
20/09/04 20:41:57 INFO zookeeper.ZooKeeper: Session: 0x1745bbdfccd02d6 closed
20/09/04 20:41:57 INFO zookeeper.ClientCnxn: EventThread shut down
```

## -- HBase shell

```
hbase(main):029:0> scan 'employee'
ROW
1
1
1
1
2
2
2
2
3
3
3
3
3 row(s) in 0.0310 seconds
```

ROW	column=personal data:city	column=personal data:name	column=professional data:designation	column=professional data:salary
1	Boston	John	Manager	150000
2	New York	Mary	Sr.Engineer	130000
3	Fremont	Bob	Sr. Engineer	94500

### -- 3. Count rows



The screenshot shows an IDE with three tabs: `MyFirstHbaseTable.java`, `Employee.java`, and `rowCount.java`. The `rowCount.java` tab is active, displaying the following Java code:

```
1 import org.apache.hadoop.hbase.client.ResultScanner;
2 import org.apache.hadoop.hbase.client.Scan;
3 import org.apache.hadoop.hbase.filter.FirstKeyOnlyFilter;
4
5 public class rowCount {
6     public static void main(String[] args) throws Exception {
7         long rowCount = 0;
8         try {
9             Configuration conf = HBaseConfiguration.create();
10            conf.set("hbase.rootdir", "hdfs://quickstart.cloudera:8020/hbase");
11            conf.set("hbase.zookeeper.quorum", "quickstart.cloudera:2181");
12            HTable table = new HTable(conf, "employee");
13            Scan scan = new Scan();
14            scan.setFilter(new FirstKeyOnlyFilter());
15            ResultScanner resultScanner = table.getScanner(scan);
16            for (Result result : resultScanner) {
17                rowCount += result.size();
18            }
19            System.out.println("rowCount-->" + rowCount);
20        } catch (IOException e) {}
21    }
22 }
```

Below the code editor, the `Console` tab is active, showing the following output:

```
<terminated> rowCount [Java Application] /usr/java/jdk1.8.0_181/bin/java (Sep 6, 2020, 10:48:16 AM)
20/09/06 10:48:24 INFO zookeeper.ClientCnxn: Session establishment complete on server quickstart.cloudera/192.168.75.129:2181, sessionId = 0x174
rowCount-->3
```

### -- HBase shell

```
hbase(main):030:0> count 'employee'
3 row(s) in 0.1190 seconds
```