

Assignment 22.1 – Kafka Introduction.

To solve all the tasks we need to start the zookeeper and the Kafka broker as show below in the screen shots.

First, we will go to KAFKA directory by changing the directory path and run the command to start zookeeper server by using following commands

```
cd $KAFKA_HOME
```

```
./bin/zookeeper-server-start.sh ./config/zookeeper.properties
```

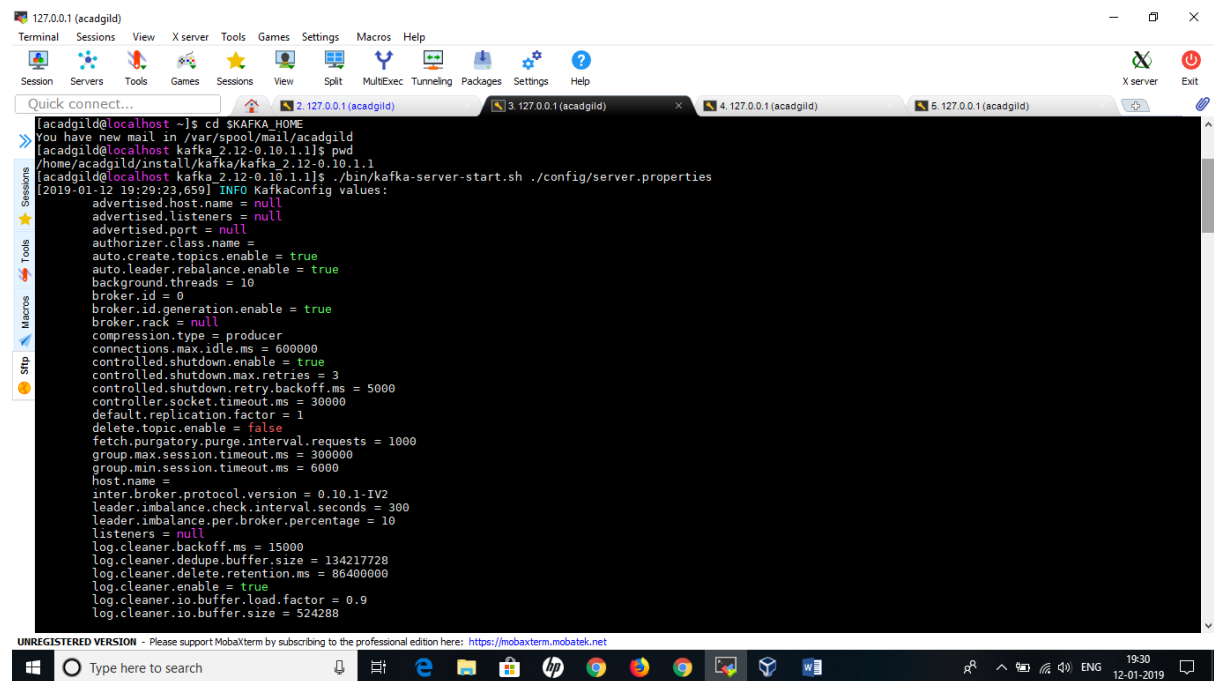
```
127.0.0.1 [acagild]
Terminal Sessions View X server Tools Stars Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultExec Tunneling Packages Settings Help
Quick connect... x 3 127.0.0.1 [acagild] x 3 127.0.0.1 [acagild] x 4 127.0.0.1 [acagild] x 5 127.0.0.1 [acagild]
[acagild@localhost ~]$
[acagild@localhost ~]$ cd $KAFKA_HOME
[acagild@localhost kafka-2.12-0.10.1.l1$ pwd
/home/acagild/install/kafka/kafka-2.12-0.10.1.l1
[acagild@localhost kafka-2.12-0.10.1.l1$ ./bin/zookeeper-server-start.sh /config/zookeeper.properties
(2019-01-12 19:26:52,908) INFO Reading configuration from: /config/zookeeper.properties (org.apache.zookeeper.server.QuorumPeerConfig)
(2019-01-12 19:26:52,936) INFO autopurge.snapshotInterval set to 3 (org.apache.zookeeper.server.DataDirCleanupManager)
(2019-01-12 19:26:52,936) INFO autopurge.snapRetainCount set to 0 (org.apache.zookeeper.server.DataDirCleanupManager)
(2019-01-12 19:26:52,936) INFO Purge task is not scheduled. (org.apache.zookeeper.server.DataDirCleanupManager)
(2019-01-12 19:26:53,238) INFO Reading configuration from: /config/zookeeper.properties (org.apache.zookeeper.server.QuorumPeerMain)
(2019-01-12 19:26:53,242) INFO Starting server (org.apache.zookeeper.server.ZooKeeperServerMain)
(2019-01-12 19:26:53,316) INFO Server environment:zookeeper.version=3.4.8-1, built on 02/06/2016 03:18 GMT (org.apache.zookeeper.server.ZooKeeperServer)
(2019-01-12 19:26:53,316) INFO Server environment:host.name=localhost (org.apache.zookeeper.server.ZooKeeperServer)
(2019-01-12 19:26:53,316) INFO Server environment:java.version=1.8_0_151 (org.apache.zookeeper.server.ZooKeeperServer)
(2019-01-12 19:26:53,316) INFO Server environment:java.vendor=Oracle Corporation (org.apache.zookeeper.server.ZooKeeperServer)
(2019-01-12 19:26:53,316) INFO Server environment:java.home=/usr/java/jdk1.8.0_151/jre (org.apache.zookeeper.server.ZooKeeperServer)
(2019-01-12 19:26:53,316) INFO Server environment:java.class.path=/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/aopalliance-repackaged-2.4.0-b34.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/argparse4j-0.5.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/connect-api-0.10.1.l1.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/connect-file-0.10.1.l1.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/connect-json-0.10.1.l1.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/guava-22.2.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/hk2-api-2.4.0-b34.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/hk2-locator-2.4.0-b34.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/hk2-utils-2.4.0-b34.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jackson-annotations-2.6.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jackson-core-2.6.3.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jackson-databind-2.6.3.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jackson-jaxrs-base-2.6.3.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jackson-jaxrs-json-provider-2.6.3.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jackson-module-jaxb-annotations-2.6.3.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/javax-annotation-api-1.2.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/javassist-3.18.2-GA.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/javax-inject-1.2.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/javax-servlet-api-3.1.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/javax-ws-rs-api-2.0.1.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jersey-client-2.22.2.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jersey-common-2.22.2.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jersey-container-servlet-2.22.2.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jersey-guava-2.22.2.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jersey-media-jaxb-2.22.2.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jersey-server-2.22.2.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jetty-continuation-9.2.15.v20160210.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jetty-http-9.2.15.v20160210.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jetty-security-9.2.15.v20160210.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jetty-server-9.2.15.v20160210.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jetty-servlet-9.2.15.v20160210.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jetty-servlets-9.2.15.v20160210.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jetty-util-9.2.15.v20160210.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/jopt-simple-5.0.4.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/logback-classic-1.2.3.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/logback-core-1.2.3.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/maven-artifact-3.0.9.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/minimal-logger-0.3.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/netty-3.10.4.Final.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/netty-all-4.1.9.Final.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/osgi-compendium-4.2.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/osgi.core-4.2.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/osgi.enterprise-4.2.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/osgi.framework-4.2.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/osgi.service.bundle-4.2.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/osgi.service.component-4.2.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/osgi.system-4.2.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/osgi.util.promise-4.2.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/osgi.validator-4.2.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/packaging-0.1.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/peterson-3.0.2.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/rxjava-1.2.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/rxjava-core-1.2.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/rxjava-io-1.2.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/rxnetty-1.0.10.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/scalacheck-1.14.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/scalatest-2.2.9.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/scalatest-core-2.2.9.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/scalatest-lifecycle-2.2.9.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/scalatest-mustcheck-2.2.9.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/scalatest-scalacheck-2.2.9.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/scalatest-test-2.2.9.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/shaded-netty-3.10.4.Final.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/shaded-netty-all-4.1.9.Final.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/slf4j-api-1.7.25.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/slf4j-log4j12-1.7.25.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/stax-ex-1.7.2.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/stax2-api-2.3.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/trove4j-3.0.3.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/xercesImpl-2.12.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/xmlenc-1.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/xmlschema-core-1.0.4.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/xmlschema-dom4-1.0.4.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/xmlschema-java-1.0.4.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/xmlschema-org-1.0.4.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/xmlschema-saxon-HE-9.6.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/xmlschema-saxon-9.6.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/xmlschema-saxon-dom4-9.6.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/xmlschema-saxon-org-9.6.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/xmlschema-saxon-he-9.6.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/xmlschema-saxon-he-dom4-9.6.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin/../libs/xmlschema-saxon-he-org-9.6.0.jar:/home/acagild/install/kafka/kafka-2.12-0.10.1.l1/bin
```

[illegible]

To start kafka server we use the below command in KAFKA home directory

cd \$KAFKA_HOME

./bin/kafka-server-start.sh ./config/server.properties



```
[acadgild@localhost ~]$ cd $KAFKA_HOME
You have new mail in /var/spool/mail/acadgild
[acadgild@localhost kafka 2.12-0.10.1.1]$ pwd
/home/acadgild/install/kafka/kafka-2.12-0.10.1.1
[acadgild@localhost kafka 2.12-0.10.1.1]$ ./bin/kafka-server-start.sh ./config/server.properties
[2019-01-12 19:29:23,659] INFO KafkaConfig values:
  advertised.host.name = null
  advertised.listeners = null
  advertised.port = null
  authorizer.class.name =
  auto.create.topics.enable = true
  auto.leader.rebalance.enable = true
  background.threads = 10
  broker.id = 0
  broker.id.generation.enable = true
  broker.rack = null
  compression.type = producer
  connections.max.idle.ms = 600000
  controlled.shutdown.enable = true
  controlled.shutdown.max.retries = 3
  controlled.shutdown.retry.backoff.ms = 5000
  controller.socket.timeout.ms = 30000
  default.replication.factor = 1
  delete.topic.enable = false
  fetch.purgatory.purge.interval.requests = 1000
  group.max.session.timeout.ms = 300000
  group.min.session.timeout.ms = 6000
  host.name =
  inter.broker.protocol.version = 0.10.1-IV2
  leader.imbalance.check.interval.seconds = 300
  leader.imbalance.per.broker.percentage = 10
  listeners = null
  log.cleaner.backoff.ms = 15000
  log.cleaner.dedupe.buffer.size = 134217728
  log.cleaner.delete.retention.ms = 86400000
  log.cleaner.enable = true
  log.cleaner.io.buffer.load.factor = 0.9
  log.cleaner.io.buffer.size = 524288
```

Task 1: Create a kafka topic named KeyLessTopic.

Inside KeyLessTopic insert following data:

`{"name":"John", "exp":16}`

`{"name":"Finn", "exp":20}`

`{"name":"Cylin", "exp":18}`

`{"name":"Mark", "exp":2}`

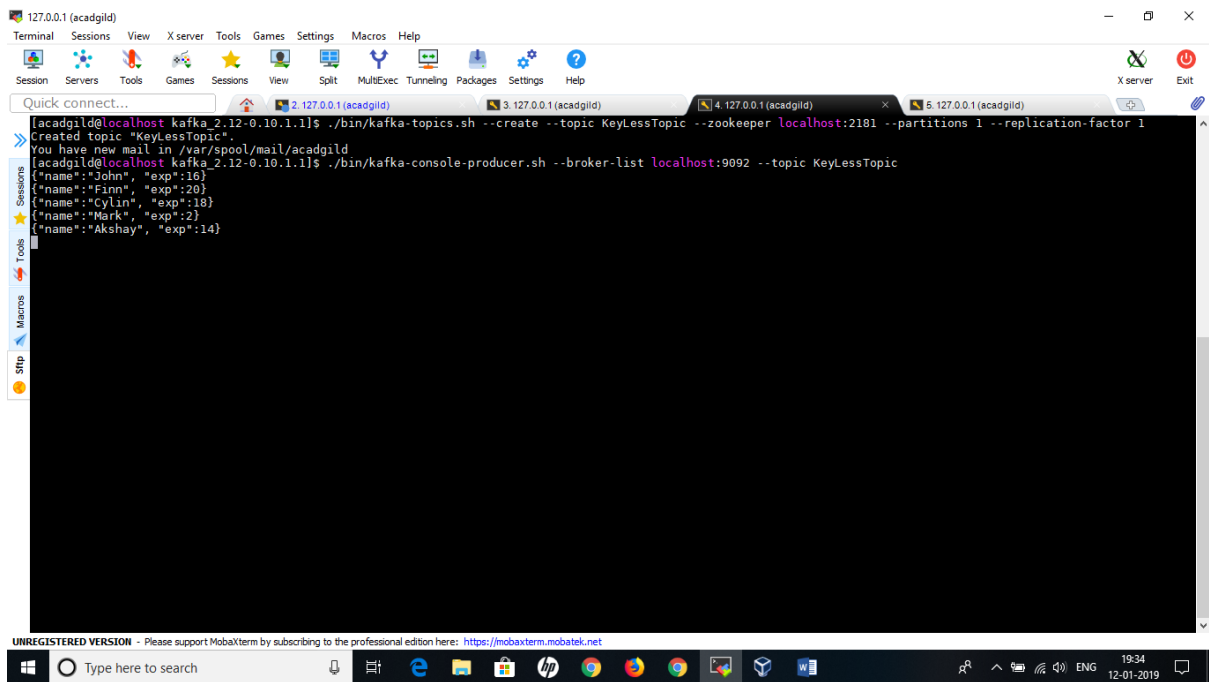
`{"name":"Akshay", "exp":14}`

We use the below command to create topic as shown in the screen shot.

./bin/kafka-topics.sh --create --topic KeyLessTopic --zookeeper localhost:2181 --partitions 1 --replication-factor 1

To insert the above data we will create kafka producer by using below command

./bin/kafka-console-producer.sh --broker-list localhost:9092 --topic KeyLessTopic

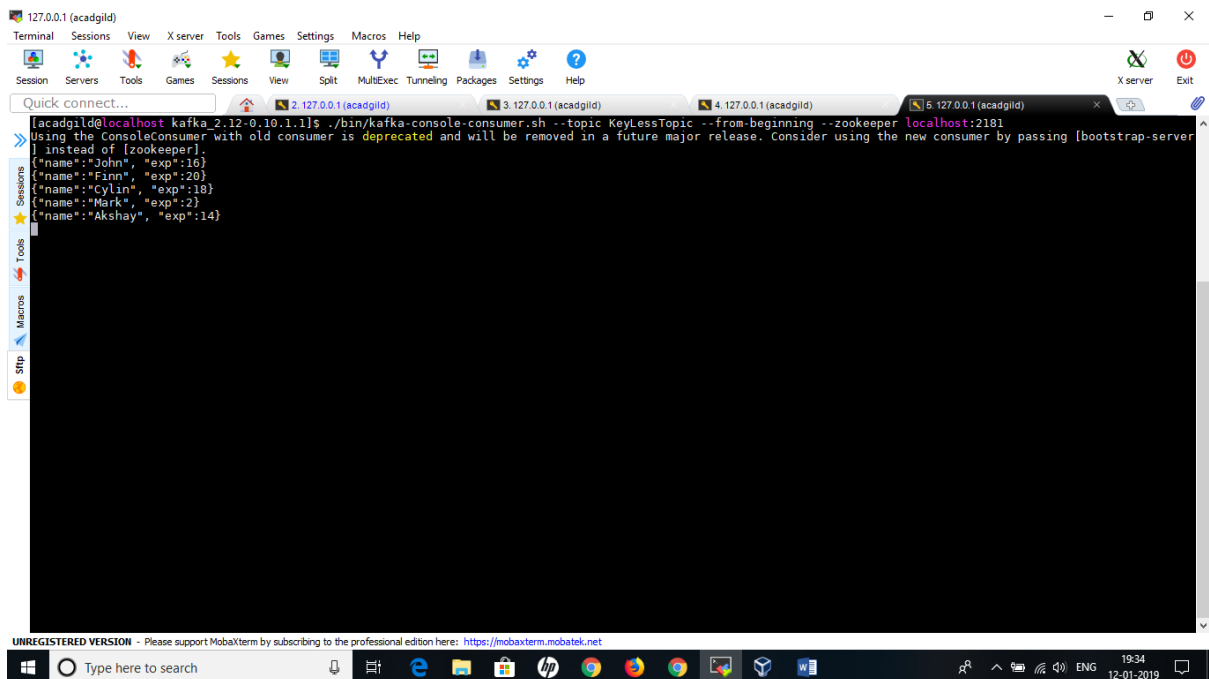


The screenshot shows a MobaXterm terminal window with the following commands and output:

```
[acadgild@localhost kafka_2.12-0.10.1.1]$ ./bin/kafka-topics.sh --create --topic KeyLessTopic --zookeeper localhost:2181 --partitions 1 --replication-factor 1
Created topic "KeyLessTopic".
[acadgild@localhost kafka_2.12-0.10.1.1]$ ./bin/kafka-console-producer.sh --broker-list localhost:9092 --topic KeyLessTopic
{"name":"John", "exp":16}
{"name":"Finn", "exp":20}
{"name":"Cylin", "exp":18}
{"name":"Mark", "exp":2}
{"name":"Akshay", "exp":14}
```

Task 2: Create a console consumer that reads KeyLessTopic from beginning

`./bin/kafka-console-consumer.sh --topic KeyLessTopic --from-beginning --zookeeper localhost:2181`



The screenshot shows a MobaXterm terminal window with the following command and output:

```
[acadgild@localhost kafka_2.12-0.10.1.1]$ ./bin/kafka-console-consumer.sh --topic KeyLessTopic --from-beginning --zookeeper localhost:2181
Using the console consumer with old consumer is deprecated and will be removed in a future major release. Consider using the new consumer by passing [bootstrap-server] instead of [zookeeper].
{"name":"John", "exp":16}
{"name":"Finn", "exp":20}
{"name":"Cylin", "exp":18}
{"name":"Mark", "exp":2}
{"name":"Akshay", "exp":14}
```

Task 3: Create a kafka topic named KeyedTopic. Inside KeyedTopic insert following data:

The part before comma(,) should be treated as key and after comma(,) should be treated as value

`{"name":"John"}, {"exp":16}`

`{"name":"Finn"}, {"exp":20}`

```
{"name":"Cylin"},"exp":18}
```

```
{"name":"Mark"},"exp":2}
```

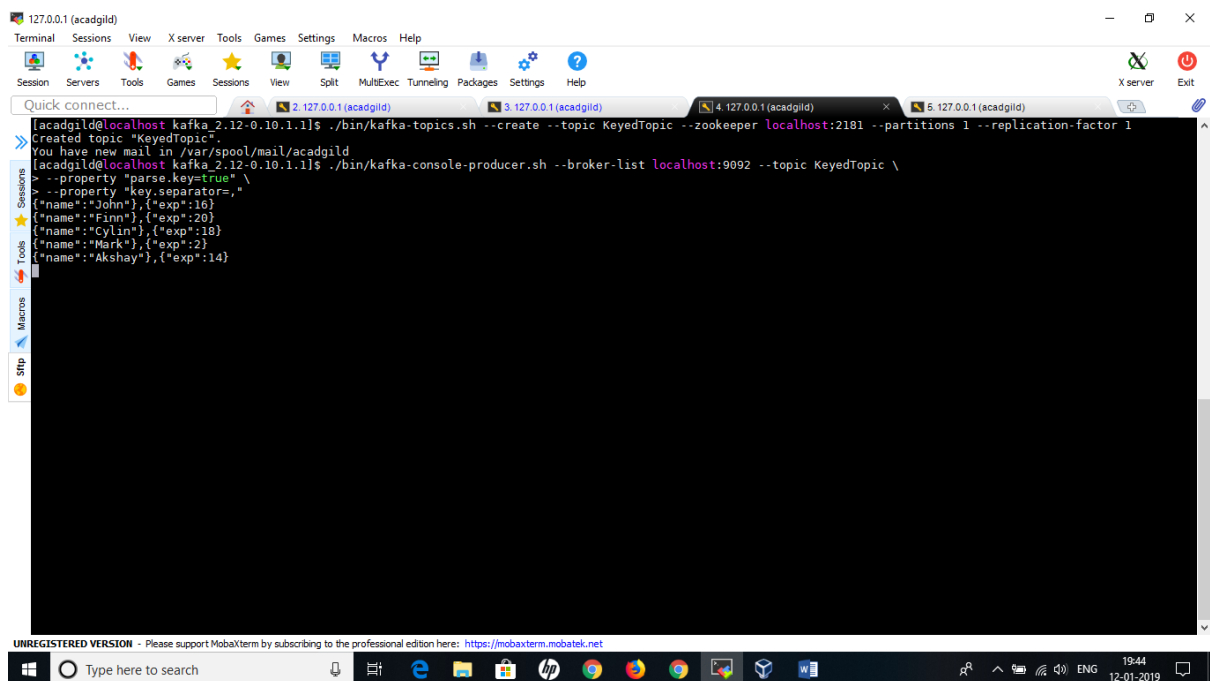
```
{"name":"Akshay"},"exp":14}
```

To Create the KeyedTopic

```
./bin/kafka-topics.sh --create --topic KeyedTopic --zookeeper localhost:2181 --partitions 1 --replication-factor 1
```

To insert the data use the below command:

```
./bin/kafka-console-producer.sh --broker-list localhost:9092 --topic KeyedTopic \  
--property "parse.key=true" \  
--property "key.separator=,"
```

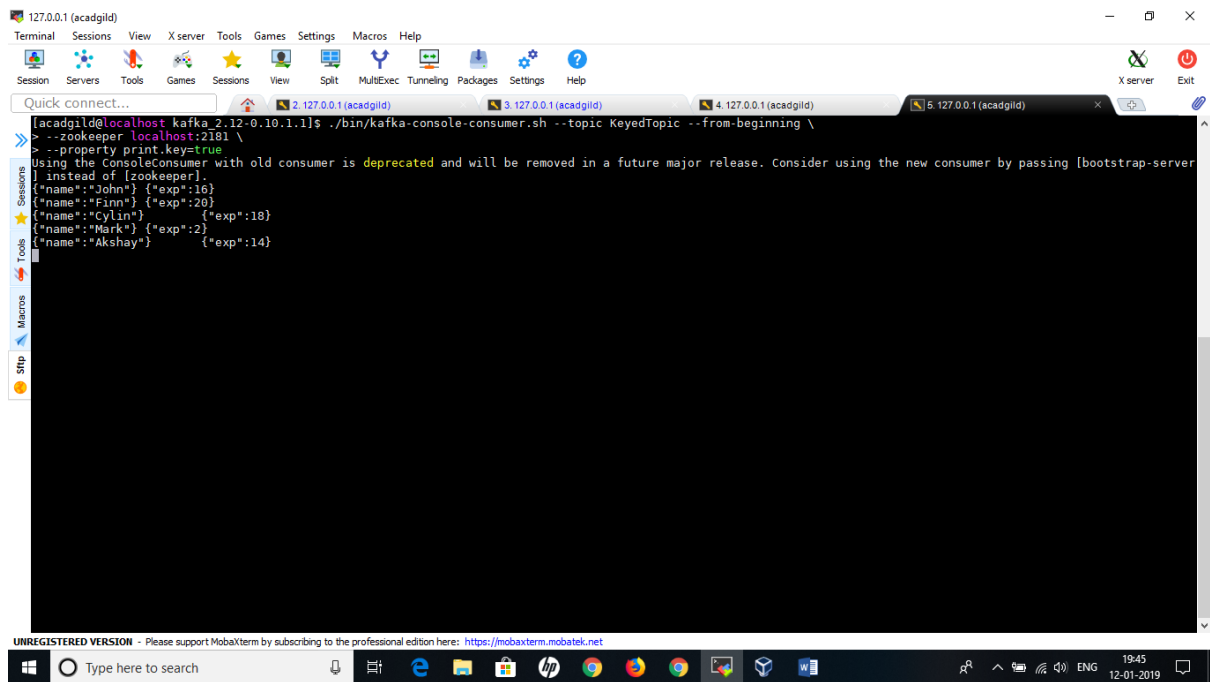


The screenshot shows a terminal window with the following commands and output:

```
[acadgild@localhost kafka_2.12-0.10.1.1]$ ./bin/kafka-topics.sh --create --topic KeyedTopic --zookeeper localhost:2181 --partitions 1 --replication-factor 1
Created topic "KeyedTopic".
You have new mail in /var/spool/mail/acadgild
[acadgild@localhost kafka_2.12-0.10.1.1]$ ./bin/kafka-console-producer.sh --broker-list localhost:9092 --topic KeyedTopic \
--property "parse.key=true" \
--property "key.separator=,"
{"name":"John"},"exp":18}
{"name":"Finn"},"exp":20}
{"name":"Cylin"},"exp":18}
{"name":"Mark"},"exp":2}
{"name":"Akshay"},"exp":14}
```

To read the data on consumer side with key value separator we use the below commad

```
./bin/kafka-console-consumer.sh --topic KeyedTopic --from-beginning \  
--zookeeper localhost:2181 \  
--property print.key=true
```



The screenshot shows a MobaXterm terminal window with the title bar '127.0.0.1 (acadgild)'. The terminal displays the following commands and output:

```
[acadgild@localhost kafka_2.12-0.10.1.1]$ ./bin/kafka-console-consumer.sh --topic KeyedTopic --from-beginning \
> --zookeeper localhost:2181 \
> --property print.key=true \
Using the ConsoleConsumer with old consumer is deprecated and will be removed in a future major release. Consider using the new consumer by passing [bootstrap.servers] instead of [zookeeper].
{"name":"John"} {"exp":16}
{"name":"Finn"} {"exp":20}
{"name":"Oylin"} {"exp":18}
{"name":"Mark"} {"exp":2}
{"name":"Akshay"} {"exp":14}
```

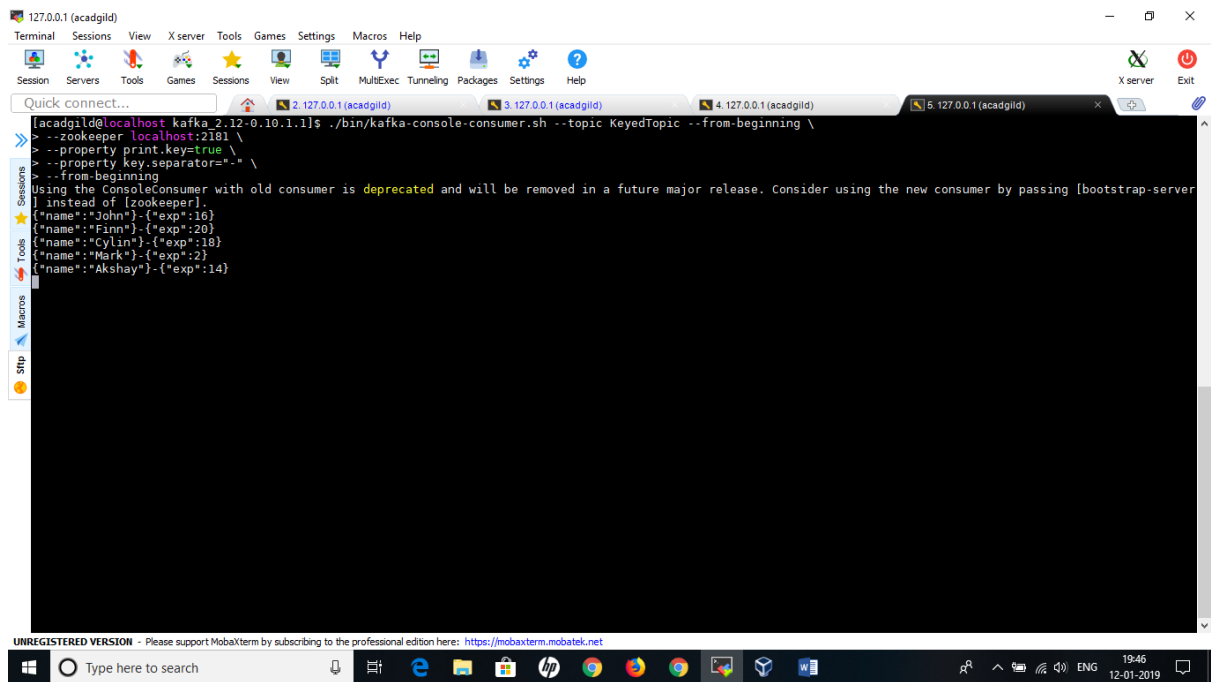
The terminal window has a sidebar on the left with icons for Session, Servers, Tools, Games, Sessions, View, Split, MultiExec, Tunneling, Packages, Settings, and Help. The bottom status bar shows 'UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>' and the system clock '19:45 12-01-2019'.

Task 4: Create a console consumer that reads KeyedTopic from beginning

The key and value should be separated by '-'

To read the data on consumer side with key value separator "-" we use the below command

```
./bin/kafka-console-consumer.sh --topic KeyedTopic --from-beginning \  
--zookeeper localhost:2181 \  
--property print.key=true \  
--property key.separator="-" \  
--from-beginning
```



The screenshot shows a MobaXterm window titled "127.0.0.1 (acadgild)". The terminal displays the following command and output:

```
[acadgild@localhost kafka_2.12-0.10.1.1]$ ./bin/kafka-console-consumer.sh --topic KeyedTopic --from-beginning \
> --zookeeper localhost:2181 \
> --property print.key=true \
> --property key.separator="-" \
> --from-beginning
Using the ConsoleConsumer with old consumer is deprecated and will be removed in a future major release. Consider using the new consumer by passing [bootstrap.servers] instead of [zookeeper].
{"name":"John"}-{"exp":16}
{"name":"Finn"}-{"exp":20}
{"name":"Cylin"}-{"exp":18}
{"name":"Mark"}-{"exp":2}
{"name":"Akshay"}-{"exp":14}
```

The output shows five JSON objects, each with a "name" and an "exp" field, separated by a hyphen. The names are John, Finn, Cylin, Mark, and Akshay, with corresponding expiration values of 16, 20, 18, 2, and 14 respectively.

At the bottom of the terminal window, there is a message: "UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>".