

Assignment - 24

For this task we need to start zookeeper and kafka broker

➤ Starting Zookeeper

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

```
[2018-12-02 14:22:04] Hbase$ SKAFKA HOME=/bin/zookeeper-server-start.sh SKAFKA HOME=/config/zookeeper.properties  
[2018-12-02 14:22:04,776] INFO Reading configuration from : /home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/config/zookeeper.properties (org.apache.zookeeper.  
server.QuorumPeerConfig)  
[2018-12-02 14:22:04,789] INFO outpurge.snapRetainCount set to 3 (org.apache.zookeeper.server.DataDirCleanupManager)  
[2018-12-02 14:22:04,789] INFO autopurge.snapshotInterval set to 0 (org.apache.zookeeper.server.DataDirCleanupManager)  
[2018-12-02 14:22:04,789] INFO Purge task is not scheduled. (org.apache.zookeeper.server.DataDirCleanupManager)  
[2018-12-02 14:22:04,789] WARN Either no config or no quorum defined in config, running in standalone mode (org.apache.zookeeper.server.QuorumPeerMain)  
[2018-12-02 14:22:04,838] INFO Reading configuration from : /home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/config/zookeeper.properties (org.apache.zookeeper.  
server.QuorumPeerConfig)  
[2018-12-02 14:22:04,839] INFO Starting server (org.apache.zookeeper.server.ZooKeeperServerMain)  
[2018-12-02 14:22:04,851] INFO Server environment:zookeeper.version=3.4.6-1, built on 02/06/2016 03:10 GMT (org.apache.zookeeper.server.ZooKeeperServer)  
[2018-12-02 14:22:04,854] INFO Server environment:host.name=cacdiadlhost (org.apache.zookeeper.server.ZooKeeperServer)  
[2018-12-02 14:22:04,854] INFO Server environment:java.version=1.8_0_151 (org.apache.zookeeper.server.ZooKeeperServer)  
[2018-12-02 14:22:04,854] INFO Server environment:java.vendor=Oracle Corporation (org.apache.zookeeper.server.ZooKeeperServer)  
[2018-12-02 14:22:04,854] INFO Server environment:java.home=/usr/java/jdk1.8_0_151/jre (org.apache.zookeeper.server.ZooKeeperServer)  
[2018-12-02 14:22:04,855] INFO Server environment:java.class.path=/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin:/lib/aospalliance-repack-2.4.8-  
0.10.1.1.jar:/lib/aospalliance-repack-2.4.8-0.10.1.1.jar:/lib/acidqldb-jdbc-driver-2.12.0-10.1.1.jar:/lib/acidqldb-jdbc-driver-2.12.0-10.1.1.jar:/lib/connect-  
j-0.10.1.1.jar:/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin:/lib/connect-file-0.10.1.1.jar:/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin/  
/lib/connect-json-0.10.1.1.jar:/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin:/lib/connect-runtime-0.10.1.1.jar:/home/cacdiadl/install/kafka/kafka-2.  
12.0-10.1.1/bin:/lib/gcp-hadoop-authentication-2.4.0-0.10.1.1.jar:/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin:/lib/hk2-api-2.4.0-0.10.1.1.jar:/home/cacdiadl/install/kafka/kafka-2.  
12.0-10.1.1/bin:/lib/hk2-locator-2.4.0-0.10.1.1.jar:/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin:/lib/hk2-utils-2.4.0-0.10.1.1.jar:/home/cacdiadl/install/kafk  
a/kafka-2.12.0-10.1.1/bin:/lib/jackson-annotations-2.6.3.jar:/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin:/lib/jackson-core-2.6.3.jar:/home/cacdiadl/in  
stall/kafka/kafka-2.12.0-10.1.1/bin:/lib/jackson-databind-2.6.3.jar:/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin:/lib/jackson-jaxrs-base-2.6.3.jar:  
/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin:/lib/jackson-jaxrs-providers-2.6.3.jar:/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin:/lib/jackso  
n-module-jaxb-annotations-2.6.3.jar:/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin:/lib/javassist-3.18.2-GA.jar:/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin:/lib/javax.annotation-api-1.2.jar:/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin:/lib/javax.inject-1.jar:/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin:/lib/javax.jmx-1.1.1.jar:/lib/javax.servlet-api-3.0.0.jar:/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin:/lib/javax.ws.rs-api-2.0.1.jar:/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin:/lib/jersey-container-servlet-2.22.2.jar:/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin:/lib/jersey-container-servlet-core-2.22.2.jar:/home/cacdiadl/install/kafka/kafka-2.12.0-10.1.1/bin:/lib/jersey-media-jaxb-2.22.2.jar
```

➤ **Starting broker**

```
$KAFKA_HOME/bin/kafka-server-start.sh $KAFKA_HOME/config/server.properties
```

```
[acadgild@localhost ~]$ $KAFKA_HOME/bin/kafka-server-start.sh $KAFKA_HOME/config/server.properties
[2018-12-02 14:18:02,011] 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
```

```
[acadgild@localhost ~]$ jps
8392 QuorumPeerMain
6696 Kafka
8922 Jps
You have new mail in /var/spool/
[acadgild@localhost ~]$
```

Task 1:

Create a java program MyKafkaProducer.java that takes a file name and delimiter as input arguments. It should read the content of file line by line. Fields in the file are in following order

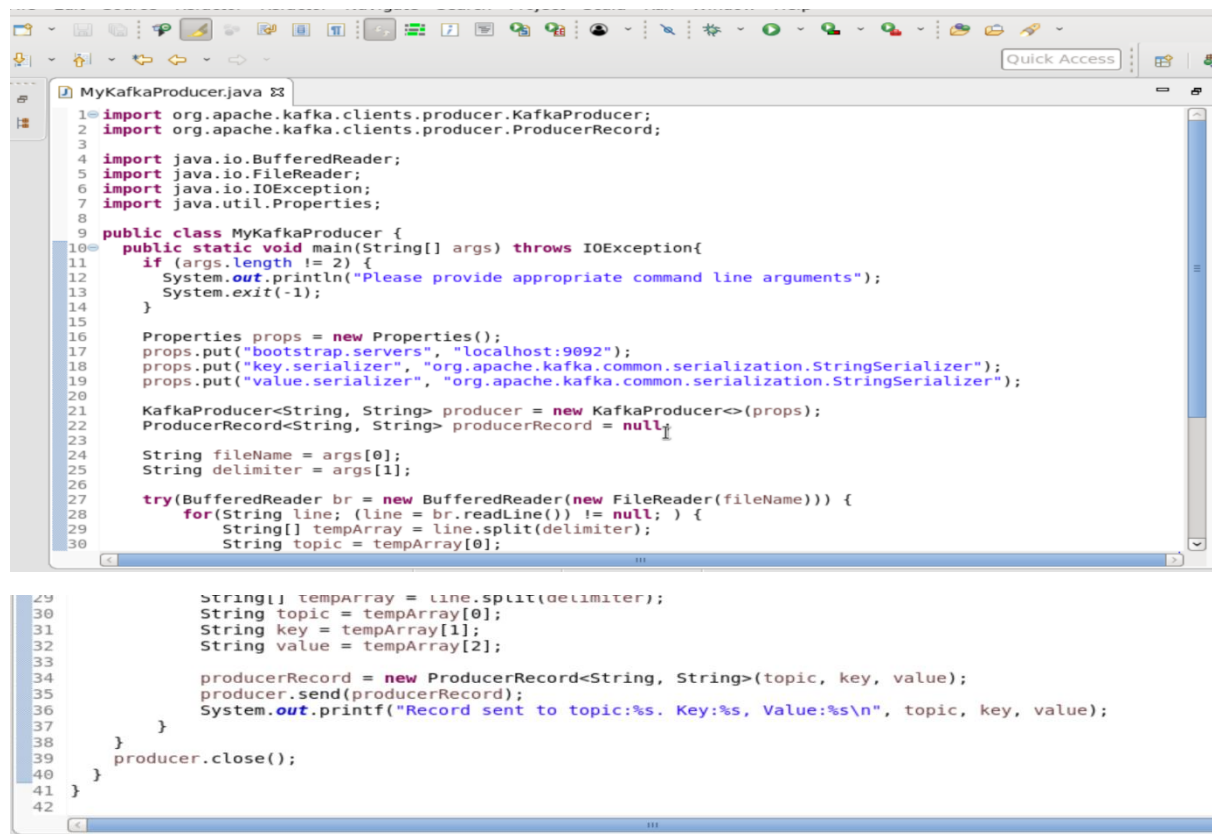
1. Kafka Topic Name
2. Key
3. value

For every line, insert the key and value to the respective Kafka broker in a fire and forget mode. After record is sent, it should print appropriate message on screen. Pass dataset_producer.txt as the input file and - as delimiter

Below is the data file

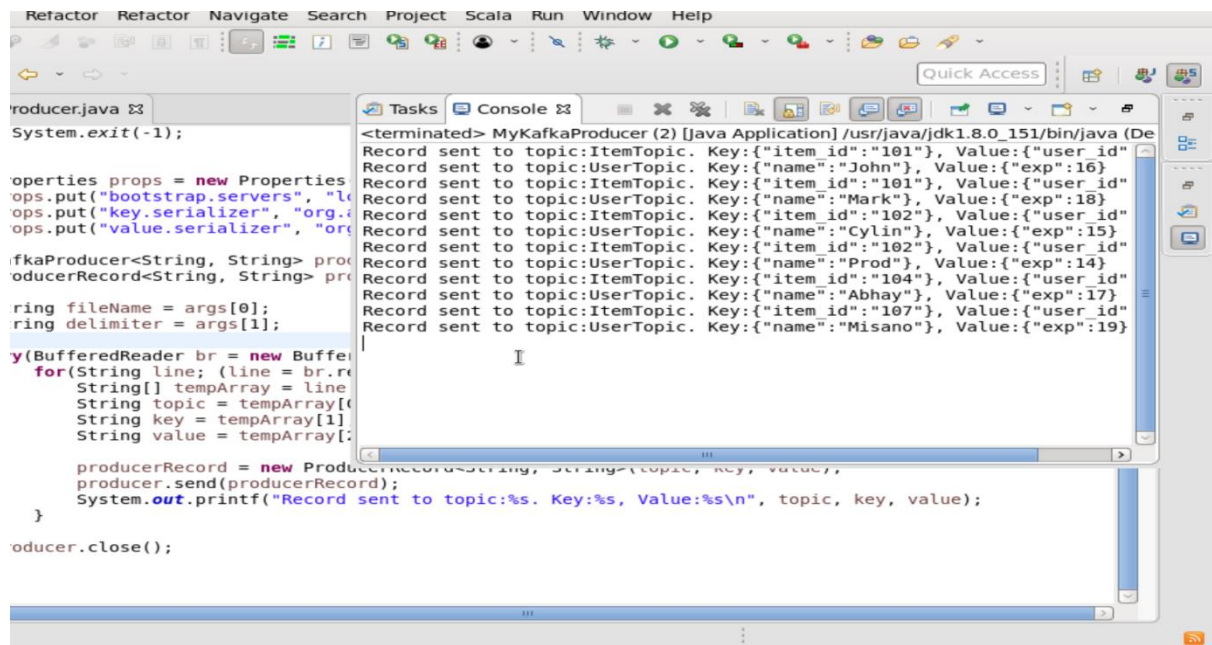
```
[acadgild@localhost ~]$ ls dat*
dataset_producer.txt
You have new mail in /var/spool/mail/acadgild
[acadgild@localhost ~]$ cat dataset_producer.txt
ItemTopic-{"item_id":"101"}-{"user_id":"U101"}
UserTopic-{"name":"John"}-{"exp":16}
ItemTopic-{"item_id":"101"}-{"user_id":"U106"}
UserTopic-{"name":"Mark"}-{"exp":18}
ItemTopic-{"item_id":"102"}-{"user_id":"U110"}
UserTopic-{"name":"Cylin"}-{"exp":15}
ItemTopic-{"item_id":"102"}-{"user_id":"U101"}
UserTopic-{"name":"Prod"}-{"exp":14}
ItemTopic-{"item_id":"104"}-{"user_id":"U102"}
UserTopic-{"name":"Abhay"}-{"exp":17}
ItemTopic-{"item_id":"107"}-{"user_id":"U104"}
UserTopic-{"name":"Misano"}-{"exp":19}
[acadgild@localhost ~]$
```

Below screenshot is the Java program MyKafkaProducer.java (original code attached)



```
1 import org.apache.kafka.clients.producer.KafkaProducer;
2 import org.apache.kafka.clients.producer.ProducerRecord;
3
4 import java.io.BufferedReader;
5 import java.io.FileReader;
6 import java.io.IOException;
7 import java.util.Properties;
8
9 public class MyKafkaProducer {
10     public static void main(String[] args) throws IOException{
11         if (args.length != 2) {
12             System.out.println("Please provide appropriate command line arguments");
13             System.exit(-1);
14         }
15
16         Properties props = new Properties();
17         props.put("bootstrap.servers", "localhost:9092");
18         props.put("key.serializer", "org.apache.kafka.common.serialization.StringSerializer");
19         props.put("value.serializer", "org.apache.kafka.common.serialization.StringSerializer");
20
21         KafkaProducer<String, String> producer = new KafkaProducer<>(props);
22         ProducerRecord<String, String> producerRecord = null;
23
24         String fileName = args[0];
25         String delimiter = args[1];
26
27         try(BufferedReader br = new BufferedReader(new FileReader(fileName))) {
28             for(String line; (line = br.readLine()) != null; ) {
29                 String[] tempArray = line.split(delimiter);
30                 String topic = tempArray[0];
31
32                 String[] temparray = line.split(delimiter);
33                 String topic = tempArray[0];
34                 String key = tempArray[1];
35                 String value = tempArray[2];
36
37                 producerRecord = new ProducerRecord<String, String>(topic, key, value);
38                 producer.send(producerRecord);
39                 System.out.printf("Record sent to topic:%s. Key:%s, Value:%s\n", topic, key, value);
40             }
41         }
42         producer.close();
43     }
44 }
```

Output



```
<terminated> MyKafkaProducer (2) [Java Application] /usr/java/jdk1.8.0_151/bin/java (De
Record sent to topic:ItemTopic. Key:{"item_id":"101"}, Value:{"user_id"
Record sent to topic:UserTopic. Key:{"name":"John"}, Value:{"exp":16}
Record sent to topic:ItemTopic. Key:{"item_id":"101"}, Value:{"user_id"
Record sent to topic:UserTopic. Key:{"name":"Mark"}, Value:{"exp":18}
Record sent to topic:ItemTopic. Key:{"item_id":"102"}, Value:{"user_id"
Record sent to topic:UserTopic. Key:{"name":"Cylin"}, Value:{"exp":15}
Record sent to topic:ItemTopic. Key:{"item_id":"102"}, Value:{"user_id"
Record sent to topic:UserTopic. Key:{"name":"Prod"}, Value:{"exp":14}
Record sent to topic:ItemTopic. Key:{"item_id":"104"}, Value:{"user_id"
Record sent to topic:UserTopic. Key:{"name":"Abhay"}, Value:{"exp":17}
Record sent to topic:ItemTopic. Key:{"item_id":"107"}, Value:{"user_id"
Record sent to topic:UserTopic. Key:{"name":"Misano"}, Value:{"exp":19}
```

List the topics you can find ItemTopic and UserTopic

\$KAFKA_HOME/bin/kafka-topics.sh --list --zookeeper localhost:2181

```
[acadgild@localhost ~]$ $KAFKA_HOME/bin/kafka-topics.sh --list --zookeeper localhost:2181
ItemTopic
KeyLessTopic
KeyedTopic
TestTopic
UserTopic
__consumer_offsets
my-replicated-topic
You have new mail in /var/spool/mail/acadgild
[acadgild@localhost ~]$
```

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Running the jar file

java -cp \$KAFKA_HOME/share/java/kafka/*:/home/acadgild/Desktop/my.jar
producer.MyKafkaProducer /home/acadgild/dataset_producer.txt -

```
[acadgild@localhost Desktop]$ java -cp $KAFKA_HOME/share/java/kafka/*:/home/acadgild/Desktop/my.jar MyKafkaProducer /home/acadgild/dataset_producer.txt -
Record sent to topic:ItemTopic. Key:{"item_id":"101"}, Value:{"user_id":"U101"}
Record sent to topic:UserTopic. Key:{"name":"John"}, Value:{"exp":16}
Record sent to topic:ItemTopic. Key:{"item_id":"101"}, Value:{"user_id":"U106"}
Record sent to topic:UserTopic. Key:{"name":"Mark"}, Value:{"exp":18}
Record sent to topic:ItemTopic. Key:{"item_id":"102"}, Value:{"user_id":"U110"}
Record sent to topic:UserTopic. Key:{"name":"Cylin"}, Value:{"exp":15}
Record sent to topic:ItemTopic. Key:{"item_id":"102"}, Value:{"user_id":"U101"}
Record sent to topic:UserTopic. Key:{"name":"Prod"}, Value:{"exp":14}
Record sent to topic:ItemTopic. Key:{"item_id":"104"}, Value:{"user_id":"U102"}
Record sent to topic:UserTopic. Key:{"name":"Abhay"}, Value:{"exp":17}
Record sent to topic:ItemTopic. Key:{"item_id":"107"}, Value:{"user_id":"U104"}
Record sent to topic:UserTopic. Key:{"name":"Misano"}, Value:{"exp":19}
[acadgild@localhost Desktop]$
```

Item topic consumer

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

```
^[[You have new mail in /var/spool/mail/acadgild
[acadgild@localhost ~]$ $KAFKA_HOME/bin/kafka-console-consumer.sh --topic ItemTopic --from-beginning --zookeeper localhost:2181 --property print.key=true
Using the ConsoleConsumer with old consumer is deprecated and will be removed in a future major release. Consider using the new consumer by passing [bootstrap-
server] instead of [zookeeper].
{"item_id":"101"} {"user_id":"U101"}
{"item_id":"101"} {"user_id":"U106"}
{"item_id":"102"} {"user_id":"U110"}
{"item_id":"102"} {"user_id":"U101"}
{"item_id":"104"} {"user_id":"U102"}
{"item_id":"107"} {"user_id":"U104"}
{"item_id":"101"} {"user_id":"U101"}
{"item_id":"101"} {"user_id":"U106"}
{"item_id":"102"} {"user_id":"U110"}
{"item_id":"102"} {"user_id":"U101"}
{"item_id":"104"} {"user_id":"U102"}
{"item_id":"107"} {"user_id":"U104"}
{"item_id":"107"} {"user_id":"U104"}
[acadgild@localhost ~]$
```

User topic consumer

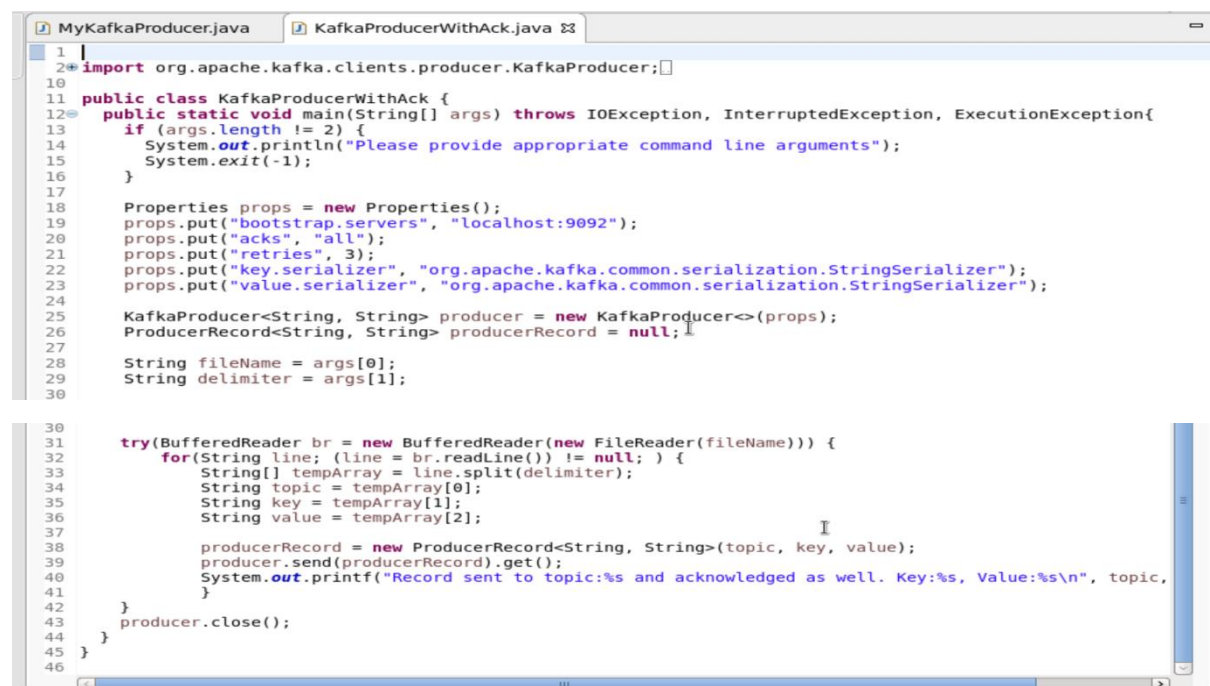
`$KAFKA_HOME/bin/kafka-console-consumer.sh --topic UserTopic --from-beginning --zookeeper localhost:2181 --property print.key=true`

```
[acadgild@localhost ~]$ $KAFKA_HOME/bin/kafka-console-consumer.sh --topic UserTopic --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":"Mark"} {"exp":18}
{"name":"Cylin"} {"exp":15}
{"name":"Prod"} {"exp":14}
{"name":"Abhay"} {"exp":17}
{"name":"Misano"} {"exp":19}
{"name":"John"} {"exp":16}
{"name":"Mark"} {"exp":18}
{"name":"Cylin"} {"exp":15}
{"name":"Prod"} {"exp":14}
{"name":"Abhay"} {"exp":17}
{"name":"Misano"} {"exp":19}
```


Task 2:

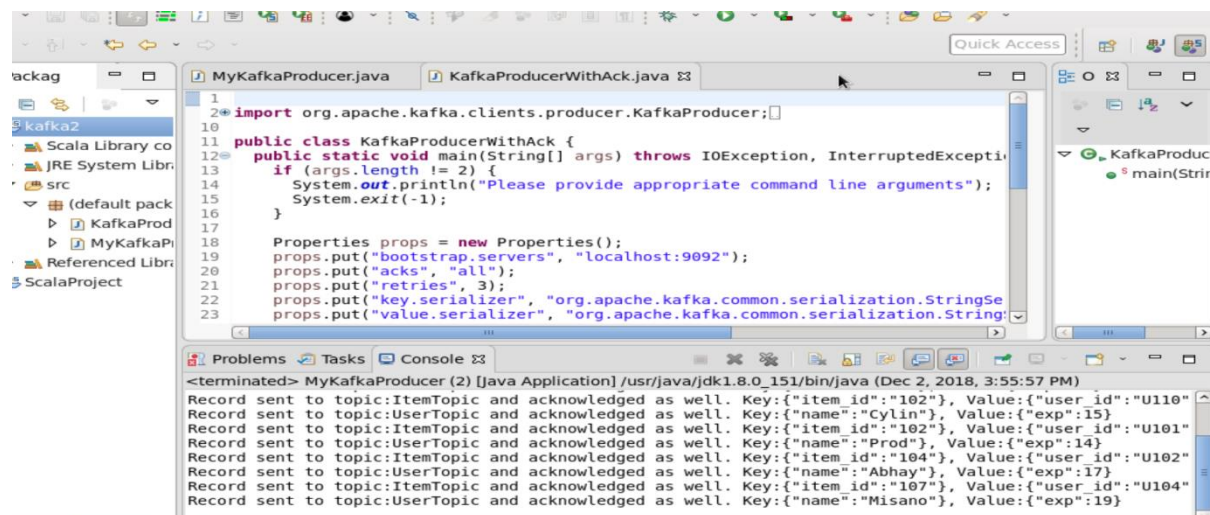
Modify the previous program `MyKafkaProducer.java` and create a new Java program `KafkaProducerWithAck.java`. This should perform the same task as of `KafkaProducer.java` with some modification. When passing any data to a topic, it should wait for acknowledgement. After acknowledgement is received from the broker, it should print the key and value, which has been written to a specified topic. The application should attempt for three retries before giving any exception. Pass `dataset_producer.txt` as the input file and `-` as delimiter.

Below screenshot is the `MyKafkaProducer.java` Code (original code attached)



```
1  import org.apache.kafka.clients.producer.KafkaProducer;
2
10
11 public class KafkaProducerWithAck {
12     public static void main(String[] args) throws IOException, InterruptedException, ExecutionException{
13         if (args.length != 2) {
14             System.out.println("Please provide appropriate command line arguments");
15             System.exit(-1);
16         }
17
18         Properties props = new Properties();
19         props.put("bootstrap.servers", "localhost:9092");
20         props.put("acks", "all");
21         props.put("retries", 3);
22         props.put("key.serializer", "org.apache.kafka.common.serialization.StringSerializer");
23         props.put("value.serializer", "org.apache.kafka.common.serialization.StringSerializer");
24
25         KafkaProducer<String, String> producer = new KafkaProducer<>(props);
26         ProducerRecord<String, String> producerRecord = null;
27
28         String fileName = args[0];
29         String delimiter = args[1];
30
31
32         try(BufferedReader br = new BufferedReader(new FileReader(fileName))) {
33             for(String line; (line = br.readLine()) != null; ) {
34                 String[] tempArray = line.split(delimiter);
35                 String topic = tempArray[0];
36                 String key = tempArray[1];
37                 String value = tempArray[2];
38
39                 producerRecord = new ProducerRecord<String, String>(topic, key, value);
40                 producer.send(producerRecord).get();
41                 System.out.printf("Record sent to topic:%s and acknowledged as well. Key:%s, Value:%s\n", topic,
42                                 key, value);
43             }
44         }
45         producer.close();
46     }
47 }
```

Output



```
<terminated> MyKafkaProducer (2) [Java Application] /usr/java/jdk1.8.0_151/bin/java (Dec 2, 2018, 3:55:57 PM)
Record sent to topic:ItemTopic and acknowledged as well. Key:{"item id":"102"}, Value:{"user id":"U110"}
Record sent to topic:UserTopic and acknowledged as well. Key:{"name":"Cylin"}, Value:{"exp":15}
Record sent to topic:ItemTopic and acknowledged as well. Key:{"item id":"102"}, Value:{"user id":"U101"}
Record sent to topic:UserTopic and acknowledged as well. Key:{"name":"Prod"}, Value:{"exp":14}
Record sent to topic:ItemTopic and acknowledged as well. Key:{"item id":"104"}, Value:{"user id":"U102"}
Record sent to topic:UserTopic and acknowledged as well. Key:{"name":"Abhay"}, Value:{"exp":17}
Record sent to topic:ItemTopic and acknowledged as well. Key:{"item id":"107"}, Value:{"user id":"U104"}
Record sent to topic:UserTopic and acknowledged as well. Key:{"name":"Misano"}, Value:{"exp":19}
```

Running the Jar

```
java -cp $KAFKA_HOME/share/java/kafka/*:/home/acadgild/Desktop/my.jar  
KafkaProducerWithAck /home/acadgild/dataset_producer.txt -
```

```
[acadgild@localhost Desktop]$ java -cp $KAFKA_HOME/share/java/kafka/*:/home/acadgild/Desktop/my.jar KafkaProducerWithAck /home/acadgild/dataset_producer.txt -  
Record sent to topic:ItemTopic and acknowledged as well. Key:{"item_id":"101"}, Value:{"user_id":"U101"}  
Record sent to topic:UserTopic and acknowledged as well. Key:{"name":"John"}, Value:{"exp":16}  
Record sent to topic:ItemTopic and acknowledged as well. Key:{"item_id":"101"}, Value:{"user_id":"U106"}  
Record sent to topic:UserTopic and acknowledged as well. Key:{"name":"Mark"}, Value:{"exp":18}  
Record sent to topic:ItemTopic and acknowledged as well. Key:{"item_id":"102"}, Value:{"user_id":"U110"}  
Record sent to topic:UserTopic and acknowledged as well. Key:{"name":"Cylin"}, Value:{"exp":15}  
Record sent to topic:ItemTopic and acknowledged as well. Key:{"item_id":"102"}, Value:{"user_id":"U101"}  
Record sent to topic:UserTopic and acknowledged as well. Key:{"name":"Prod"}, Value:{"exp":14}  
Record sent to topic:ItemTopic and acknowledged as well. Key:{"item_id":"104"}, Value:{"user_id":"U102"}  
Record sent to topic:UserTopic and acknowledged as well. Key:{"name":"Abhay"}, Value:{"exp":17}  
Record sent to topic:ItemTopic and acknowledged as well. Key:{"item_id":"107"}, Value:{"user_id":"U104"}  
Record sent to topic:UserTopic and acknowledged as well. Key:{"name":"Misano"}, Value:{"exp":19}  
You have new mail in /var/spool/mail/acadgild  
[acadgild@localhost Desktop]$
```

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User Topic output

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

```
[acadgild@localhost ~]$ $KAFKA_HOME/bin/kafka-console-consumer.sh --topic UserTopic --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-  
server] instead of [zookeeper].  
{ "name": "John" } { "exp": 16 }  
{ "name": "Mark" } { "exp": 18 }  
{ "name": "Cylin" } { "exp": 15 }  
{ "name": "Prod" } { "exp": 14 }  
{ "name": "Abhay" } { "exp": 17 }  
{ "name": "Misano" } { "exp": 19 }  
{ "name": "John" } { "exp": 16 }  
{ "name": "Mark" } { "exp": 18 }  
{ "name": "Cylin" } { "exp": 15 }  
{ "name": "Prod" } { "exp": 14 }  
{ "name": "Abhay" } { "exp": 17 }  
{ "name": "Misano" } { "exp": 19 }  
{ "name": "John" } { "exp": 16 }  
{ "name": "Mark" } { "exp": 18 }  
{ "name": "Cylin" } { "exp": 15 }  
{ "name": "Prod" } { "exp": 14 }  
{ "name": "Abhay" } { "exp": 17 }  
{ "name": "Misano" } { "exp": 19 }
```

Item Topic output

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

```
[acadgild@localhost ~]$ $KAFKA_HOME/bin/kafka-console-consumer.sh --topic ItemTopic --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-  
server] instead of [zookeeper].  
{ "item_id": "101" } { "user_id": "U101" }  
{ "item_id": "101" } { "user_id": "U106" }  
{ "item_id": "102" } { "user_id": "U110" }  
{ "item_id": "102" } { "user_id": "U101" }  
{ "item_id": "104" } { "user_id": "U102" }  
{ "item_id": "107" } { "user_id": "U104" }  
{ "item_id": "101" } { "user_id": "U101" }  
{ "item_id": "101" } { "user_id": "U106" }  
{ "item_id": "102" } { "user_id": "U110" }  
{ "item_id": "102" } { "user_id": "U101" }  
{ "item_id": "104" } { "user_id": "U102" }  
{ "item_id": "107" } { "user_id": "U104" }  
{ "item_id": "101" } { "user_id": "U101" }  
{ "item_id": "101" } { "user_id": "U106" }  
{ "item_id": "102" } { "user_id": "U110" }  
{ "item_id": "102" } { "user_id": "U101" }  
{ "item_id": "104" } { "user_id": "U102" }  
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