Screenshots and Supporting Materials for DSND Project 2

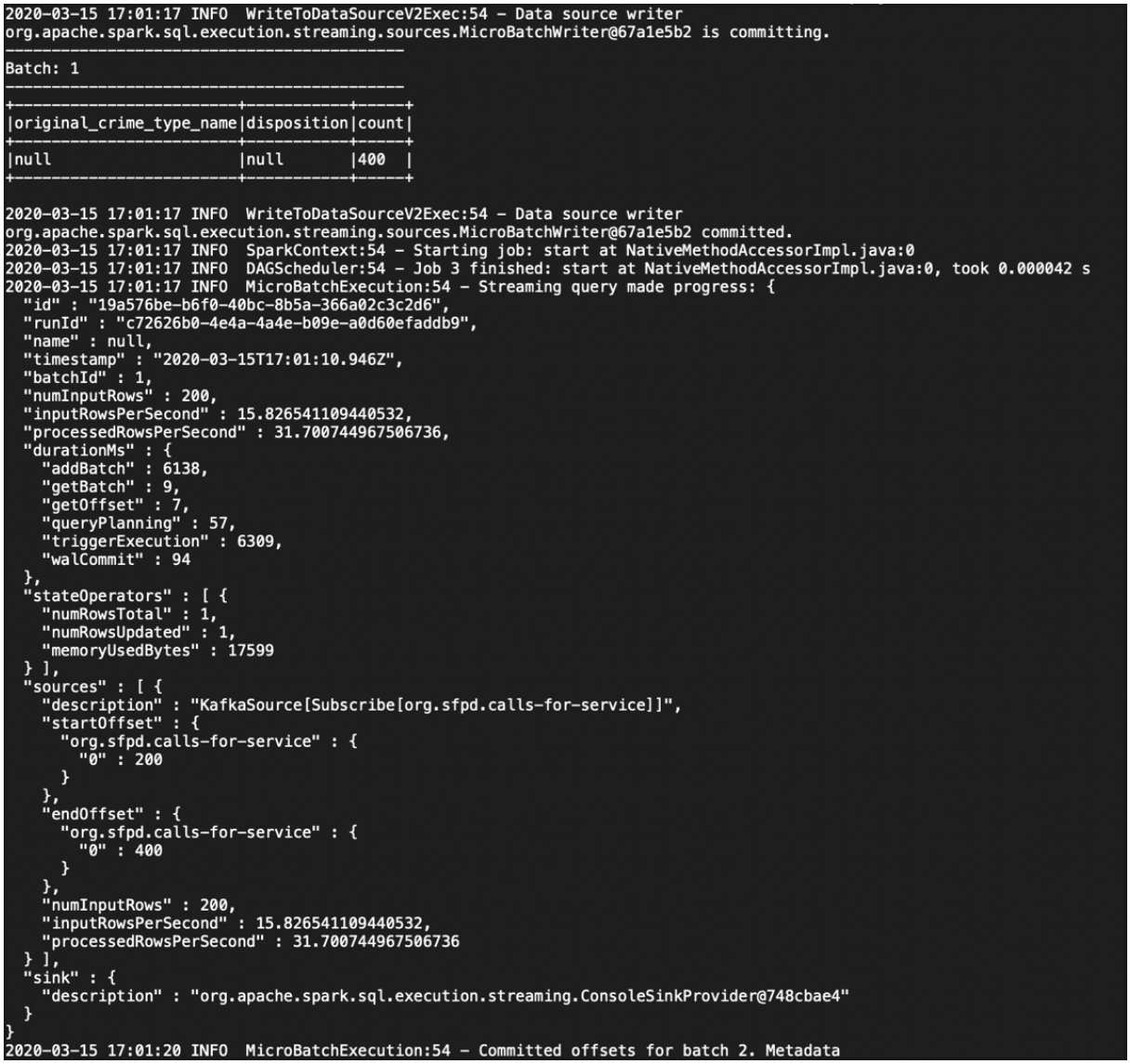
Step 1:

```
root@54512c05aa06:/home/workspace# kafka-console-consumer --bootstrap-server localh
ost:9092 --topic "org.sfpd.calls-for-service" --from-beginning
"        \"offense_date\": \"2018-12-31T00:00:00.000\",\n"
"        \"call_time\": \"22:17\",\n"
"[\n"
"    {\n"
"        \"crime_id\": \"183653763\",\n"
"        \"original_crime_type_name\": \"Traffic Stop\",\n"
"        \"report_date\": \"2018-12-31T00:00:00.000\",\n"
"        \"call_date\": \"2018-12-31T00:00:00.000\",\n"
"        \"offense_date\": \"2018-12-31T00:00:00.000\",\n"
"        \"call_time\": \"23:57\",\n"
"        \"call_date_time\": \"2018-12-31T23:57:00.000\",\n"
"        \"disposition\": \"ADM\",\n"
"        \"address\": \"Geary Bl/divisadero St\",\n"
"        \"city\": \"San Francisco\",\n"
"        \"state\": \"CA\",\n"
"        \"agency_id\": \"1\",\n"
"        \"address_type\": \"Intersection\",\n"
"        \"common_location\": \"\"\n"
"    },\n"
"    {\n"
"        \"crime_id\": \"183653756\",\n"
"        \"original_crime_type_name\": \"Traf Violation Cite\",\n"
"        \"report_date\": \"2018-12-31T00:00:00.000\",\n"
```

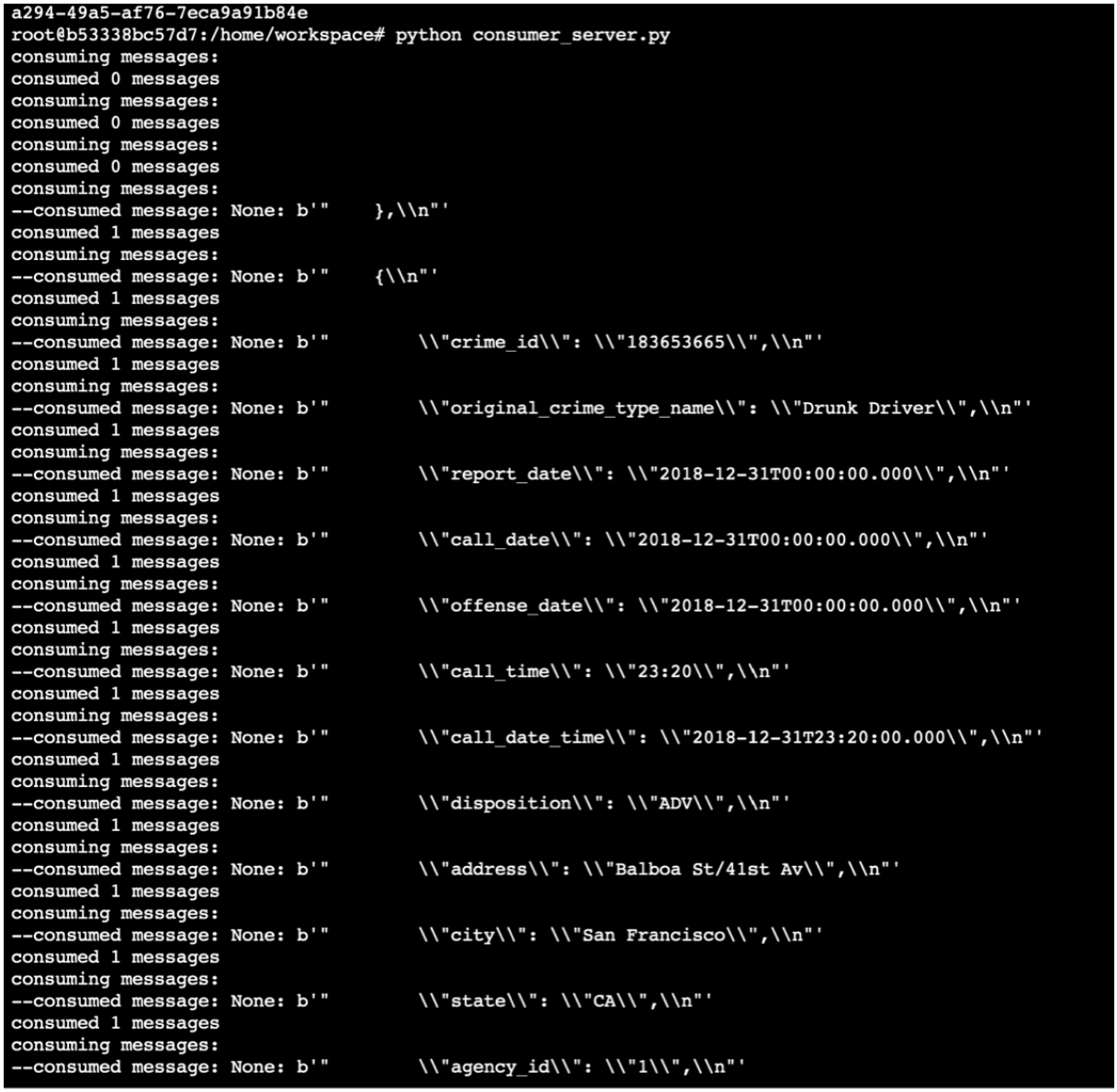
Step 2:

```
-------------------------------------------
Batch: 0
-------------------------------------------
2020-03-15 17:01:10 INFO  CodeGenerator:54 - Code generated in 18.342308 ms
2020-03-15 17:01:10 INFO  CodeGenerator:54 - Code generated in 9.179744 ms
+----------------------+-----------+-----+
|original_crime_type_name|disposition|count|
+----------------------+-----------+-----+
|null                  |null       |200  |
+----------------------+-----------+-----+

2020-03-15 17:01:10 INFO  WriteToDataSourceV2Exec:54 - Data source writer
org.apache.spark.sql.execution.streaming.sources.MicroBatchWriter@2b3d9dc6 committed.
2020-03-15 17:01:10 INFO  SparkContext:54 - Starting job: start at NativeMethodAccessorImpl.java:0
2020-03-15 17:01:10 INFO  DAGScheduler:54 - Job 1 finished: start at NativeMethodAccessorImpl.java:0, took 0.000072 s
2020-03-15 17:01:10 INFO  MicroBatchExecution:54 - Streaming query made progress: {
  "id" : "19a576be-b6f0-40bc-8b5a-366a02c3c2d6",
  "runId" : "c72626b0-4e4a-4a4e-b09e-a0d60efaddb9",
  "name" : null,
  "timestamp" : "2020-03-15T17:00:58.309Z",
  "batchId" : 0,
  "numInputRows" : 200,
  "processedRowsPerSecond" : 15.973165082661128,
  "durationMs" : {
    "addBatch" : 11541,
    "getBatch" : 247,
    "getOffset" : 347,
    "queryPlanning" : 319,
    "triggerExecution" : 12519,
    "walCommit" : 46
  },
  "stateOperators" : [ {
    "numRowsTotal" : 1,
    "numRowsUpdated" : 1,
    "memoryUsedBytes" : 12879
  } ],
  "sources" : [ {
    "description" : "KafkaSource[Subscribe[org.sfpd.calls-for-service]]",
    "startOffset" : null,
    "endOffset" : {
      "org.sfpd.calls-for-service" : {
        "0" : 200
      }
    },
    "numInputRows" : 200,
    "processedRowsPerSecond" : 15.973165082661128
  } ],
  "sink" : {
    "description" : "org.apache.spark.sql.execution.streaming.ConsoleSinkProvider@748cbae4"
  }
}
2020-03-15 17:01:11 INFO  MicroBatchExecution:54 - Committed offsets for batch 1. Metadata
```



consumer_server.py



Performance tuning settings:

`log_output_v0.txt` :

```
# readStream
.option("maxOffsetsPerTrigger", 200)
#.option("maxRatePerPartition", "")

# writeStream
.trigger(processingTime = '20 seconds')

# baseline around 32 processed rows per sec (prps) - Batch 1
```

`log_output_v1.txt`:

```
# readStream
.option("maxOffsetsPerTrigger", 200)
#.option("maxRatePerPartition", "")

# writeStream
.trigger(processingTime = '2 seconds')

# prps ~28
```

`log_output_v2.txt`:

```
# readStream
.option("maxOffsetsPerTrigger", 200)
#.option("maxRatePerPartition", "")

# writeStream
.trigger(processingTime = '200 seconds')

# prps ~15 (Batch 0 - not representative?)
```

`log_output_v3.txt`:

```
# readStream
.option("maxOffsetsPerTrigger", 2000)
#.option("maxRatePerPartition", "")

# writeStream
.trigger(processingTime = '20 seconds')

# large difference in prps: 28 before, 287 after (Batch 1)
```

`log_output_v4.txt`:

```
# readStream
.option("maxOffsetsPerTrigger", 2000)
#.option("maxRatePerPartition", "")

# writeStream
.trigger(processingTime = '2 seconds')

# large negative impact difference in prps: 287 down to 1
```

`log_output_v5.txt`:

```
# readStream
.option("maxOffsetsPerTrigger", 2000)
#.option("maxRatePerPartition", "")

# writeStream
.trigger(processingTime = '200 seconds')

# prps ~155 (Batch 0 - only batch)
```

`log_output_v6.txt`:

```
# readStream
.option("maxOffsetsPerTrigger", 2000)
.option("maxRatePerPartition", 100)

# writeStream
.trigger(processingTime = '20 seconds')

# prps ~323
```

`log_output_v7.txt`:

```
# readStream
.option("maxOffsetsPerTrigger", 2000)
.option("maxRatePerPartition", 1000)

# writeStream
.trigger(processingTime = '20 seconds')

# prps ~294
```

`log_output_v8.txt`:

```
# readStream
.option("maxOffsetsPerTrigger", 2000)
.option("maxRatePerPartition", 10)

# writeStream
.trigger(processingTime = '20 seconds')

# prps ~320
```

`log_output_v9.txt`:

```
# 3 minute run

# readStream
.option("maxOffsetsPerTrigger", 2000)
.option("maxRatePerPartition", 100)

# writeStream
.trigger(processingTime = '40 seconds')

# prps ~306
```

`log_output_v10.txt`:

```
# 3 minute run


# readStream
.option("maxOffsetsPerTrigger", 2000)
.option("maxRatePerPartition", 10)


# writeStream
.trigger(processingTime = '40 seconds')


# prps ~334
```

#U/Udacity/Data Streaming Nanodegree#