Team 3

Deliverable 1

GCPS Bus Monitoring System

Michael Rizig, Sam Bostian, Charlie McLarty, Brian Pruitt, Allen Roman

**Initial Development of Kafka Consumer, Producer, and Data Processing.**

In this deliverable, we have 3 elements: The Kafka Server (not in this file), **Kafka Producer (Producer.py)**, and **Kafka Consumer (Consumer.py)**. This guide will go through each file line step by step, and expand on what each script is doing.

Producer.py:  
The Producer.py file "produces" and feeds data into the Kafka server for real-time distribution.

Step 1: Import Kafka native API for python

from kafka import KafkaProducer

Step 2: Define server address and desired topic on said server:

TOPICNAME = 'GCPS\_Bus\_Monitoring'

SERVERIP = 'localhost:9092' #insert server ip here

Step 3: Connect to the server via Kafka producer object and pass ip

producer = KafkaProducer(bootstrap\_servers=SERVERIP)

Step 4: Publish data to the topic

producer.send(TOPICNAME,b'data')

producer.flush()

Thats it! This is the basic concept of the producer file. **In application, this producer would resemble the buses sending their location and id data to the Kafka server,** which would in turn pass that data to every 'consumer' subscribed to that topic. This style of 'producer' and 'consumer' design follows the [Publish-Subcribe Paradigm](https://en.wikipedia.org/wiki/Publish%E2%80%93subscribe_pattern).

Consumer.py:  
The Consumer.py file "consumes" the real-time data. In this demo, it simply prints the data to the console, but in application, this file would determine which bus a given event belongs to and insert the data received from that event into the relational database with the correct primary/foreign key (depending on the database scheme).

Step 1: Import Kafka native API for python

from kafka import KafkaConsumer

Step 2: Define server address and desired topic on said server:

TOPICNAME = 'GCPS\_Bus\_Monitoring'

SERVERIP = 'localhost:9092' #insert server ip here

Step 3: Connect to he server via Kafka consumer object and pass desired topic

consumer = KafkaConsumer(TOPICNAME, bootstrap\_servers=SERVERIP)

Step 4: Parse data: (**In application, this loop would parse the JSON, find the bus id, and insert the data into the relational database, but for demo purposes, the loop simply prints the data to the console.**)

for messages in consumer:

print(messages)