In [1]:
```
# import statements
from kafka import KafkaConsumer
import datetime as dt
from json import loads
import statistics
import matplotlib.pyplot as plt
import statistics

# this line is needed for the inline display of graphs in Jupyter Notebook
%matplotlib notebook

topic = 'Week9-Topic2'

def connect_kafka_consumer():
    _consumer = None
    try:
         _consumer = KafkaConsumer(topic,
                                   # consumer_timeout_ms=10000, # stop iteration if
no message after 10 sec
                                   auto_offset_reset='earliest', # comment this if
you don't want to consume earliest available message
                                   bootstrap_servers=['localhost:9092'],
                                   value_deserializer=lambda x:
loads(x.decode('ascii')),
                                   api_version=(0, 10))

    except Exception as ex:
        print('Exception while connecting Kafka')
        print(str(ex))
    finally:
        return _consumer

def init_plots():
    try:
        width = 9.5
        height = 6
        fig = plt.figure(figsize=(width,height)) # create new figure
        fig.subplots_adjust(hspace=0.6)
        ax1 = fig.add_subplot(221)
        ax1.set_xlabel('Time')
        ax1.set_ylabel('Value')

        ax2 = fig.add_subplot(222)
        ax2.set_xlabel('Time')
        ax2.set_ylabel('Value')

        ax3 = fig.add_subplot(223)
        ax3.set_xlabel('Time')
        ax3.set_ylabel('Value')

        ax4 = fig.add_subplot(224)
        ax4.set_xlabel('Time')
        ax4.set_ylabel('Value')

        fig.suptitle('Real-time uniform stream data visualization') # giving figure a
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title
        fig.show() # displaying the figure
        fig.canvas.draw() # drawing on the canvas
        return fig, ax1, ax2, ax3, ax4
    except Exception as ex:
        print(str(ex))

def consume_messages(consumer, fig, ax1, ax2, ax3, ax4):
    try:
        # container for x and y values
        # x4 and y4 holds the average values
        x1, y1, x2, y2, x3, y3, ave_x, ave_y, temp = [], [], [], [], [], [], [], [],
[]
        firstIteration = True
        # print('Waiting for messages')
        for message in consumer:
            message = message.value
            # print(message)
            if 'producer05-1' in message:
                x1.append(message['datetime'])
                y1.append(message['producer05-1'])
            if 'producer05-2' in message:
                x2.append(message['datetime'])
                y2.append(message['producer05-2'])
            if 'producer05-3' in message:
                x3.append(message['datetime'])
                y3.append(message['producer05-3'])


            # we start plotting only when we have 10 data points
            if len(y1) > 10 and len(y2) > 10 and len(y3) > 10:
                if (firstIteration):
                    firstIteration = False
                    for i, datetime in enumerate(x1):
                        ave_x.append(datetime)
                        ave_y.append(statistics.mean([y1[i], y2[i], y3[i]]))
                else:
                    ave_x.append(message['datetime'])
                    ave_y.append(statistics.mean([y1[-1], y2[-1], y3[-1]]))

                ax1.clear()
                ax2.clear()
                ax3.clear()
                ax4.clear()

                ax1.plot(x1, y1, color='r')
                ax2.plot(x2, y2, color='b')
                ax3.plot(x3, y3, color='g')
                ax4.plot(ave_x, ave_y)

#                 ax1.set_xlim(left=max(0, i[0] - 50), right=i[0])
                ax1.set_title("Producer 1")
                ax1.set_xlabel("Time(sec)")
                ax1.set_ylabel("Data")
```
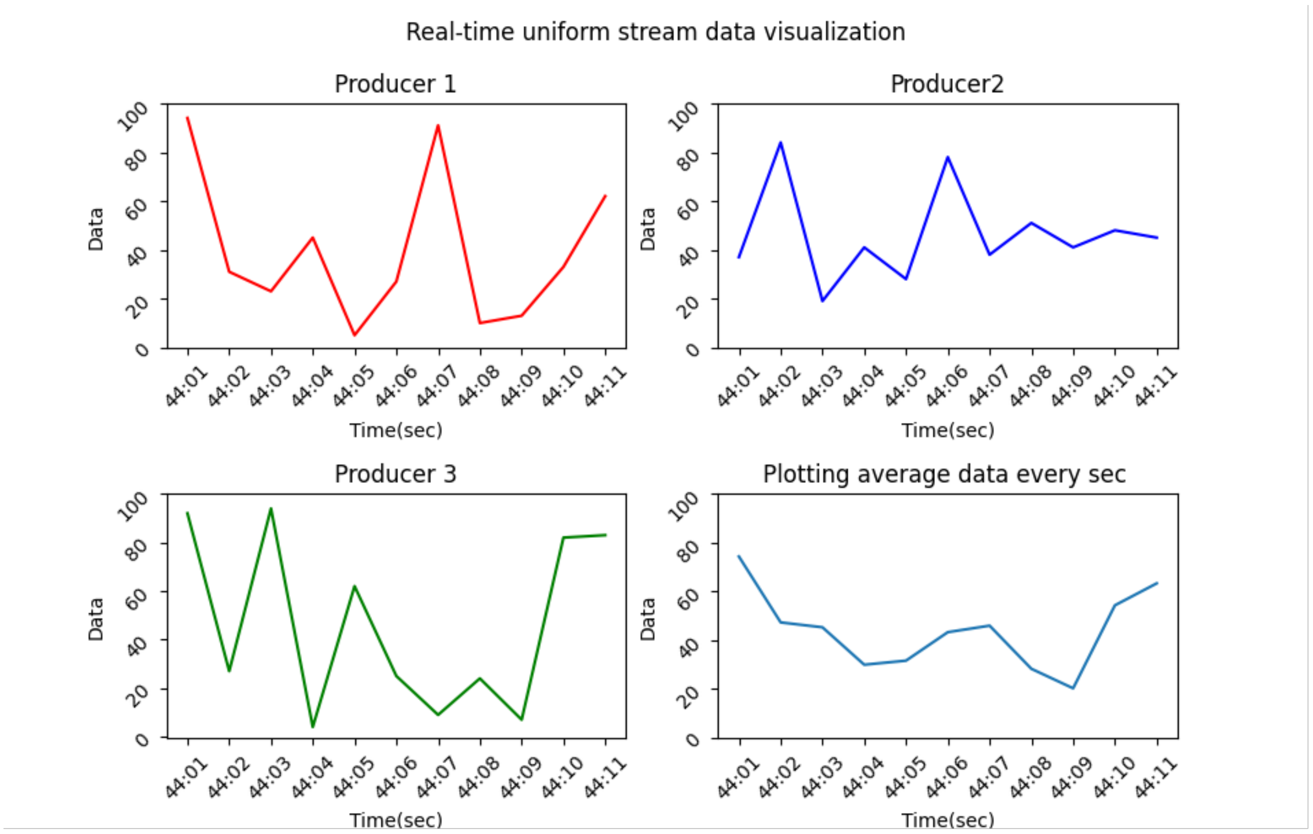

```
#                 ax2.set_xlim(left=max(0, i[1] - 50), right=i[1])
                ax2.set_title("Producer2")
                ax2.set_xlabel("Time(sec)")
                ax2.set_ylabel("Data")

#                 ax3.set_xlim(left=max(0, i[2] - 50), right=i[2])
                ax3.set_title("Producer 3")
                ax3.set_xlabel("Time(sec)")
                ax3.set_ylabel("Data")

#                 ax4.set_xlim(left=max(0, i[3] - 50), right=i[3])
                ax4.set_title("Plotting average data every sec ")
                ax4.set_xlabel("Time(sec)")
                ax4.set_ylabel("Data")

                ax1.set_yticks([0,20,40,60,80,100])
                ax1.tick_params(labelrotation=45)
                ax2.set_yticks([0,20,40,60,80,100])
                ax2.tick_params(labelrotation=45)
                ax3.set_yticks([0,20,40,60,80,100])
                ax3.tick_params(labelrotation=45)
                ax4.set_yticks([0,20,40,60,80,100])
                ax4.tick_params(labelrotation=45)

                fig.canvas.draw()
                x1.pop(0)
                y1.pop(0)
                x2.pop(0)
                y2.pop(0)
                x3.pop(0)
                y3.pop(0)
                ave_x.pop(0)
                ave_y.pop(0)
        plt.close('all')
    except Exception as ex:
        print(str(ex))

if __name__ == '__main__':

    consumer = connect_kafka_consumer()
    fig, ax1, ax2, ax3, ax4 = init_plots()
    consume_messages(consumer, fig, ax1, ax2, ax3, ax4)
```



```
---------------------------------------------------------------------------
KeyboardInterrupt                         Traceback (most recent call last)
<ipython-input-1-7a3c17e6df10> in <module>
    144     consumer = connect_kafka_consumer()
    145     fig, ax1, ax2, ax3, ax4 = init_plots()
--> 146     consume_messages(consumer, fig, ax1, ax2, ax3, ax4)
    147
    148

<ipython-input-1-7a3c17e6df10> in consume_messages(consumer, fig, ax1, ax2, ax3, ax4)
     63         firstIteration = True
     64         # print('Waiting for messages')
---> 65         for message in consumer:
     66             message = message.value
     67             # print(message)

~/.local/lib/python3.8/site-packages/kafka/consumer/group.py in __next__(self)
   1190             return self.next_v1()
   1191         else:
-> 1192             return self.next_v2()
   1193
   1194     def next_v2(self):

~/.local/lib/python3.8/site-packages/kafka/consumer/group.py in next_v2(self)
   1198                 self._iterator = self._message_generator_v2()
   1199             try:
-> 1200                 return next(self._iterator)
   1201             except StopIteration:
   1202                 self._iterator = None

~/.local/lib/python3.8/site-packages/kafka/consumer/group.py in
```

```
_message_generator_v2(self)
   1113     def _message_generator_v2(self):
   1114         timeout_ms = 1000 * (self._consumer_timeout - time.time())
-> 1115         record_map = self.poll(timeout_ms=timeout_ms, update_offsets=False)
   1116         for tp, records in six.iteritems(record_map):
   1117             # Generators are stateful, and it is possible that the tp /
records

~/.local/lib/python3.8/site-packages/kafka/consumer/group.py in poll(self,
timeout_ms, max_records, update_offsets)
    652         remaining = timeout_ms
    653         while True:
--> 654             records = self._poll_once(remaining, max_records,
update_offsets=update_offsets)
    655             if records:
    656                 return records

~/.local/lib/python3.8/site-packages/kafka/consumer/group.py in _poll_once(self,
timeout_ms, max_records, update_offsets)
    699
    700         timeout_ms = min(timeout_ms, self._coordinator.time_to_next_poll() *
1000)
--> 701         self._client.poll(timeout_ms=timeout_ms)
    702         # after the long poll, we should check whether the group needs to
rebalance
    703         # prior to returning data so that the group can stabilize faster

~/.local/lib/python3.8/site-packages/kafka/client_async.py in poll(self, timeout_ms,
future)
    598                     timeout = max(0, timeout)  # avoid negative timeouts
    599
--> 600                 self._poll(timeout / 1000)
    601
    602             # called without the lock to avoid deadlock potential

~/.local/lib/python3.8/site-packages/kafka/client_async.py in _poll(self, timeout)
    630
    631         start_select = time.time()
--> 632         ready = self._selector.select(timeout)
    633         end_select = time.time()
    634         if self._sensors:

/usr/lib/python3.8/selectors.py in select(self, timeout)
    466             ready = []
    467             try:
--> 468                 fd_event_list = self._selector.poll(timeout, max_ev)
    469             except InterruptedError:
    470                 return ready

KeyboardInterrupt:
```

In [ ]:

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