**Tutorial 3c – GroupBy, GroupByKey, CoGroupByKey and GroupIntoBatches Transform in Apache Beam**

**GroupBy:**

* Takes a collection of elements and produces a collection grouped, by properties of those elements.
* Unlike GroupByKey, the key is dynamically created from the elements themselves.

**GroupByKey:**

* GroupByKey is a Beam transform for processing collections of key/value pairs.
* It’s a parallel reduction operation, analogous to the Shuffle phase of a Map/Shuffle/Reduce-style algorithm.
* For example, if you have a collection that stores records of customer orders, you might want to group together all the orders from the same postal code (wherein the “key” of the key/value pair is the postal code field, and the “value” is the remainder of the record).
* Takes a keyed collection of elements and produces a collection where each element consists of a key and all values associated with that key.

**CoGroupByKey:**

* Aggregates all input elements by their key and allows downstream processing to consume all values associated with the key.
* While GroupByKey performs this operation over a single input collection and thus a single type of input values, CoGroupByKey operates over multiple input collections. As a result, the result for each key is a tuple of the values associated with that key in each input collection.

**GroupIntoBatches:**

* Batches the input into desired batch size.

**Resources:**

* <https://beam.apache.org/documentation/transforms/python/aggregation/groupby/>
* <https://beam.apache.org/documentation/programming-guide/#groupbykey>
  + <https://beam.apache.org/documentation/transforms/python/aggregation/groupbykey/>
* <https://beam.apache.org/documentation/programming-guide/#cogroupbykey>
  + <https://beam.apache.org/documentation/transforms/python/aggregation/cogroupbykey/>
* <https://beam.apache.org/documentation/transforms/python/aggregation/groupintobatches/>