Coding Pattern

1 Benchmark Function (main function)

```
run_benchmark()
      save the current time as the start of the 'benchmark' action
      READ the configuration parameters into the memory (config params `file.configuration.name ...`)
      READ the bulk file data into the partitioned collection bulk_data_partitions (config param 'file.bulk.name')
      partition key = modulo (ASCII value of 1st byte of key * 256 + ASCII value of 2nd byte of key,
                              number partitions (config param 'benchmark.number.partitions'))
      Create a separate database connection (without auto commit behaviour) for each partition

      trial_no = 0

      WHILE trial_no < config_param 'benchmark.trials'
            DO run_trial(database connections, trial_no, bulk_data_partitions)
      ENDWHILE

      partition_no = 0

      WHILE partition_no < config_param 'benchmark.number.partitions'
            close the database connection
      ENDWHILE

      WRITE an entry for the action 'benchmark' in the result file (config param 'file.result.name')
```

Coding Pattern

2 Trial Function

```
run_trial(database connections, trial_no, bulk_data_partitions)
INPUT: the database connections
       the current trial number
       the partitioned bulk data

      save the current time as the start of the 'trial' action

      create the database table (config param 'sql.create')

      IF error
            drop the database table (config param 'sql.drop')
            create the database table (config param 'sql.create')
      ENDIF

      DO run_insert(database connections, trial_no, bulk_data_partitions)
      DO run_select(database connections, trial_no, bulk_data_partitions)

      drop the database table (config param 'sql.drop')

      WRITE an entry for the action 'trial' in the result file (config param 'file.result.name')
```

Coding Pattern

3 Insert Control Function

```
run_insert(database connections, trial_no, bulk_data_partitions)
INPUT: the database connections
       the current trial number
       the partitioned bulk data

      save the current time as the start of the 'query' action

      partition_no = 0

      WHILE partition_no < config_param 'benchmark.number.partitions'
            IF config_param 'benchmark.core.multiplier' = 0
                  DO run_insert_helper(database connections(partition_no), bulk_data_partitions(partition_no))
            ELSE
                  DO run_insert_helper (database connections(partition_no), bulk_data_partitions(partition_no)) as a
            thread
            ENDIF
      ENDWHILE

      WRITE an entry for the action 'query' in the result file (config param 'file.result.name')
```

Coding Pattern

4 Insert Helper Function

```
run_insert_helper (database connection, bulk_data_partition)
INPUT: the database connection
       the bulk data partition

     count = 0
     collection batch_collection = empty

     WHILE iterating through the collection bulk_data_partition
           count + 1

           add the SQL statement in config param 'sql.insert' with the current bulk_data entry to the collection
           batch_collection

           IF config_param 'benchmark.batch.size' > 0
                 IF count modulo config param 'benchmark.batch.size' = 0
                       execute the SQL statements in the collection batch_collection
                       batch_collection = empty
                 ENDIF
           ENDIF

           IF config param 'benchmark.transaction.size' > 0 AND count modulo config param 'benchmark.transaction.size'
           = 0
```

Coding Pattern

```
            commit
      ENDIF
ENDWHILE

IF collection batch_collection is not empty
      execute the SQL statements in the collection batch_collection
ENDIF

commit
```

Coding Pattern

5 Select Control Function

```
run_select(database connections, trial_no, bulk_data_partitions)
INPUT: the database connections
       the current trial number
       the partitioned bulk data

      save the current time as the start of the 'query' action

      partition_no = 0

      WHILE partition_no < config_param 'benchmark.number.partitions'
            IF config_param 'benchmark.core.multiplier' = 0
                  DO run_select_helper(database connections(partition_no), bulk_data_partitions(partition_no,
            partition_no)
            ELSE
                  DO run_select_helper (database connections(partition_no), bulk_data_partitions(partition_no,
            partition_no) as a thread
            ENDIF
      ENDWHILE

      WRITE an entry for the action 'query' in the result file (config param 'file.result.name')
```

Coding Pattern

6 Select Helper Function

```
run_select_helper (database connection, bulk_data_partition, partition_no)
INPUT: the database connection
       the bulk data partition
       the current partition number

      save the current time as the start of the 'query' action

      count = 0

      execute the SQL statement in config param 'sql.select'

      WHILE iterating through the result set
            count + 1
      ENDWHILE

      IF NOT count = size(bulk_data_partition)
            display an error message
      ENDIF
```