

Coding Pattern

1 Benchmark Function (main function)

run_benchmark()

- **READ** the configuration parameters into the memory (config params `file.configuration.name ...`)
- save the current time as the start time of the 'benchmark' action
- **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
 * 251
 + 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_max = 0
 trial_min = 0
 trial_no = 0
 trial_sum = 0
 WHILE trial_no < config_param 'benchmark.trials'
 duration_trial = **DO** **run_trial**(database connections,
 trial_no,
 bulk_data_partitions)
 IF trial_max == 0 OR duration_trial > trial_max
 trial_max = duration_trial
 END IF
 IF trial_min == 0 OR duration_trial < trial_min
 trial_min = duration_trial
 END IF
 trial_sum + duration_trial
 ENDWHILE
- partition_key = 0
 WHILE partition_key < config_param 'benchmark.number.partitions'
 close the database connection
 ENDWHILE

Coding Pattern

- **WRITE** an entry for the action 'benchmark' in the result file (config param 'file.result.name')
- INFO Duration (ms) trial min. : trial_min
INFO Duration (ms) trial max. : trial_max
INFO Duration (ms) trial average : trial_sum / config_param 'benchmark.trials'
- INFO Duration (ms) benchmark run : duration_benchmark

Coding Pattern

2 Trial Function

```
run_trial(database connections,
          trial_no,
          bulk_data_partitions)

- save the current time as the start time 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')

- RETURN duration = end time - start time
```

Coding Pattern

3 Insert Control Function

```
run_insert(database connections,
           trial_no,
           bulk_data_partitions)

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

- partition_key = 0
  WHILE partition_key < config_param 'benchmark.number.partitions'
    IF config_param 'benchmark.core.multiplier' = 0
      DO run_insert_helper(database connections(partition_key),
                          bulk_data_partitions(partition_key),
                          partition_key)

    ELSE
      DO run_insert_helper (database connections(partition_key),
                          bulk_data_partitions(partition_key,
                          partition_key)) as a thread

    ENDIF
  ENDWHILE

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

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4 Insert Helper Function

```
run_insert_helper (database connection,
                  bulk_data_partition,
                  partition_key)

- INFO Start insert partition_key=partition_key

- 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
        commit
    ENDIF
  ENDWHILE

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

- commit

- INFO End    insert partition_key=partition_key
```

Coding Pattern

5 Select Control Function

```
run_select(database connections,
           trial_no,
           bulk_data_partitions)

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

- partition_key = 0
  WHILE partition_key < config_param 'benchmark.number.partitions'
    IF config_param 'benchmark.core.multiplier' = 0
      DO run_select_helper(database connections(partition_key),
                          bulk_data_partitions(partition_key,
                          partition_key)

    ELSE
      DO run_select_helper (database connections(partition_key),
                          bulk_data_partitions(partition_key,
                          partition_key) 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_key)  
  
- INFO Start select partition_key=partition_key  
  
- execute the SQL statement in config param 'sql.select'  
  
- count = 0  
  WHILE iterating through the result set  
    count + 1  
  ENDWHILE  
  
- IF NOT count = size(bulk_data_partition)  
  display an error message  
ENDIF  
  
- INFO End    select partition_key=partition_key
```