Kmeans CPU-GPU Class (K) + Multi-Dimensional Performance Analysis

2019

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Analysis Report Bases

- The USCensus1990raw data set was collected as part of the 1990 census from the (U.S. Department of Commerce) Census Bureau website at http://www.census.gov/.

- The data set was extracted using the Data Extraction System found at http://dataferrett.census.gov/.

- The data set is a 1% sample of the Public Use Microdata Samples (PUMS) person records drawn from the full 1990 census sample.

- The sample contains 68 categorical attributes with a sequence of operations via Randomization and Selection of Attributes.

- The sample also contains 2,458,285 number of instances reduced by 40.68% (1million) for advanced analytics insight and final results readability via .CSV to Microsoft Excel.

CLASS K - PERFORMANCE TABLE PER TIME(s)

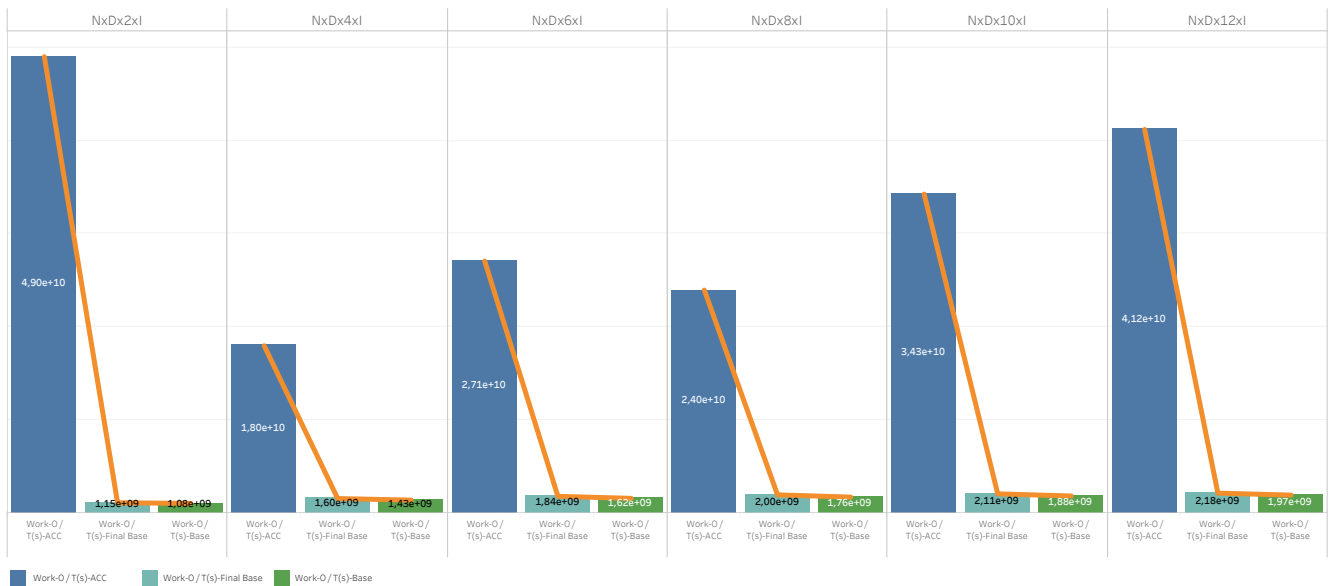| Class (K) Performance Analysis	N(Rows)	Dimensions	Class (K)	I (Iterations)	Work-O (NxKxDxI)	T(s)-ACC	T(s)-Final Base	T(s)-Base
NxDx2xl	1.000.000	68	2	200	27,20B	0,56 s	23,66 s	25,12 s
NxDx4xl	1.000.000	68	4	200	54,40B	3,02 s	33,94 s	37,97 s
NxDx6xl	1.000.000	68	6	200	81,60B	3,01 s	44,37 s	50,25 s
NxDx8xl	1.000.000	68	8	200	108,80B	4,54 s	54,44 s	61,87 s
NxDx10xl	1.000.000	68	10	200	136,00B	3,97 s	64,57 s	72,49 s
NxDx12xl	1.000.000	68	12	200	163,20B	3,96 s	74,75 s	82,76 s

CLASS K - PERFORMANCE FLOW PER TIME (s)
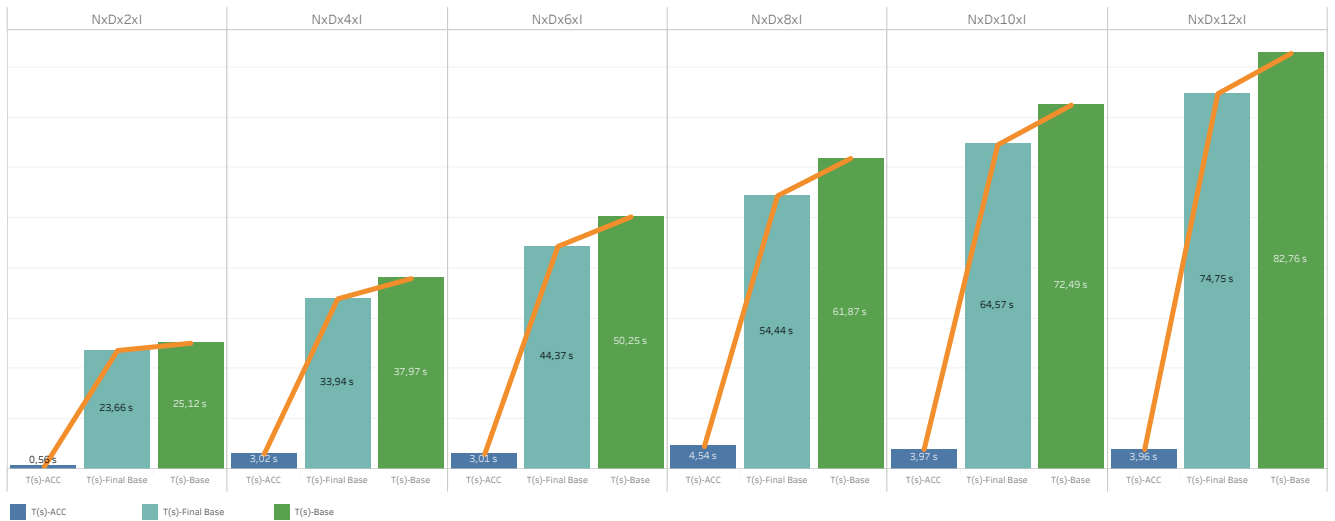
CLASS K - PERFORMANCE TABLES PER WORK O(NxDxKxl)/TIME(s)

Class (K) Performance Analysis	N(Rows)	Dimensions	Class (K)	I (Iterations)	Work-O (NxKxDxI)	Work-O / T(s)-ACC	Work-O / T(s)-Final Base	Work-O / T(s)-Base
NxDx2xl	1.000.000	68	2	200	27,20B	4,90e+10	1,15e+09	1,08e+09
NxDx4xl	1.000.000	68	4	200	54,40B	1,80e+10	1,60e+09	1,43e+09
NxDx6xl	1.000.000	68	6	200	81,60B	2,71e+10	1,84e+09	1,62e+09
NxDx8xl	1.000.000	68	8	200	108,80B	2,40e+10	2,00e+09	1,76e+09
NxDx10xl	1.000.000	68	10	200	136,00B	3,43e+10	2,11e+09	1,88e+09
NxDx12xl	1.000.000	68	12	200	163,20B	4,12e+10	2,18e+09	1,97e+09

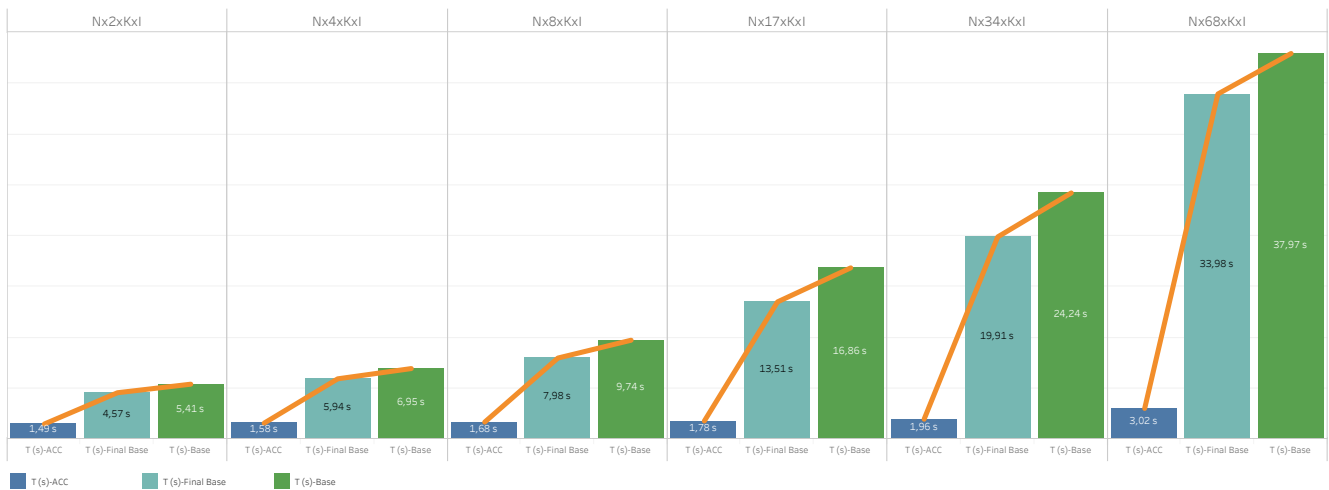## CLASS K - PERFORMANCE FLOW PER WORK O(NxDxKxl)/TIME(s)

DIMENSION - PERFORMANCE TABLE PER TIME(s)

Dimension Performance Analysis	N(Rows)	Dimensions	Class (K)	I (Iterations)	Work-O (NxKxDxI)	T (s)-ACC	T (s)-Final Base	T (s)-Base
Nx2xKxI	1.000.000	2	4	200	1,60B	1,49 s	4,57 s	5,41 s
Nx4xKxI	1.000.000	4	4	200	3,20B	1,58 s	5,94 s	6,95 s
Nx8xKxI	1.000.000	8	4	200	6,40B	1,68 s	7,98 s	9,74 s
Nx17xKxI	1.000.000	17	4	200	13,60B	1,78 s	13,51 s	16,86 s
Nx34xKxI	1.000.000	34	4	200	27,20B	1,96 s	19,91 s	24,24 s
Nx68xKxI	1.000.000	68	4	200	54,40B	3,02 s	33,98 s	37,97 s

DIMENSION PERFORMANCE PER TIME (s)

DIMENSION - PERFORMANCE TABLES PER WORK O(NxDxKxI)/TIME(s)

Dimension Performance Analysis	N(Rows)	Dimensions	Class (K)	I (Iterations)	Work-O (NxKxDxI)	Work-O / T(s)-ACC	Work-O / T(s)-Final Base	Work-O / T(s)-Base
Nx2xKxI	1.000.000	2	4	200	1,60B	1,07e+09	3,50e+08	2,96e+08
Nx4xKxI	1.000.000	4	4	200	3,20B	2,03e+09	5,39e+08	4,61e+08
Nx8xKxI	1.000.000	8	4	200	6,40B	3,82e+09	8,02e+08	6,57e+08
Nx17xKxI	1.000.000	17	4	200	13,60B	7,64e+09	1,01e+09	8,07e+08
Nx34xKxI	1.000.000	34	4	200	27,20B	1,38e+10	1,37e+09	1,12e+09
Nx68xKxI	1.000.000	68	4	200	54,40B	1,80e+10	1,60e+09	1,43e+09

DIMENSION PERFORMANCE PER WORK O(NxDxKxI)/TIME(s)