A Computational Analysis of a Novel Chromatic k-Nearest Neighbours Algorithm - Appendix

Thomas van der Plas

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Scenario	gen (ms)	build tree (ms)	tree range (ms)	naive range (ms)	fast mode (ms)	naive mode (ms)
Uniform color scenarios						
A1, k=10	3.7	1.5	19.8	3.1	2	2.2
A1, k=25	3.8	1.3	19.7	10.1	1.6	2.3
A1, k=50	3.9	1.4	22.8	24.9	1.2	2.8
A1, k=75	4.5	1.6	22.2	39.8	1.3	3.3
A1, k=100	3.8	1.3	20.5	52.4	1	3.3
A1, k=250	4.3	1.5	21.5	133.2	0.9	5.3
A1, k=500	3.9	1.4	21.1	242.2	0.8	7.7
A1, k=750	4.9	1.5	23.1	324	0.8	12.8
A2, k=10	220.1	127.3	27.3	3.6	2.2	2.3
A2, k=25	192.6	81.4	23.4	10.2	2.2	2.4
A2, k=50	189.6	83	22.4	23.6	2.3	2.5
A2, k=75	190.9	85.1	24.3	38.5	2.5	2.8
A2, k=100	190.6	86.7	23.8	54.4	2.7	3
A2, k=250	191.6	91.7	23.8	156.4	2.8	5.3
A2, k=500	192.6	97.2	25.3	343.5	2.3	7.3
A2, k=750	192.1	104.1	22.5	530	2.3	10
A2, k=1000	190.2	107.9	25	725	2.2	12.9
A2, k=1500	218.3	123.6	27.8	1224.4	2.4	19
A2, k=2000	232.2	102.4	30.9	1725.3	2.7	29.2
A3, k=10	26105.5	52324.5	43	5.4	3.9	3.9
A3, k=25	23041.6	54227.4	34.5	12.4	3	2.9
A3, k=50	20897.5	48096	31	28.4	3.1	3
A3, k=75	20664.4	45760.4	30.1	45.3	3.3	3.2
A3, k=100	22019.2	53695.5	36.2	66.6	3.9	3.7
A3, k=250	24700.2	52039.6	37.7	206.2	7.8	6.5
A3, k=500	23187.9	48065.6	40.2	454.2	9.2	11.5
A3, k=750	23504.3	46964.4	36.9	724.1	8.6	12.7
A3, k=1000	21720.4	42355.7	33.9	931	8	16.4
A3, k=1500	21485.9	51212.2	33.7	1450.9	7.3	20.2
A3, k=2000	22185.3	48120.9	33.9	2040.4	8.1	28.7
A4, k=10	4.6	1.7	21.3	3.5	2.4	2.6
A4, k=25	4.6	1.4	21.7	10.8	1.9	2.8
A4, k=50	4.9	1.4	20.9	24.8	1.5	3.1
A4, k=75	4.4	1.3	21.6	39.2	1.3	3.2
A4, k=100	4.9	1.5	22.1	58.2	1.3	3.8
A4, k=250	4.9	1.5	26.6	153	1.1	6.2
A4, k=500	5.3	1.6	24.8	290.8	1	9.9
A4, k=750	5.6	1.8	24.4	349.7	0.8	13.9
A5, k=10	196.1	114.1	24	3.3	2.5	2.5
A5, k=25	194.6	114.3	23	10.2	2.5	2.6
A5, k=50	194.2	114.9	24.7	23.6	2.7	2.9
A5, k=75	189.9	117.6	22.4	38.5	3.2	3.1
A5, k=100	194.6	119.4	22.6	54.9	4.1	3.4
A5, k=250	197.6	123.4	24.1	159	3.2	5
A5, k=500	195.8	123.9	23.8	345.1	2.8	8.3
A5, k=750	193.4	124.1	23	529.8	2.6	10.3
A5, k=1000	194	129.1	22.7	720.5	2.5	14.6
A5, k=1000	396.4	152.4	45.7	1276.5	5.1	24.4
A5, k=1500	231	122.1	28.3	1271	2.9	21
A5, k=2000	237.6	95.6	26.6	1713.8	3.1	29.3
A6, k=10	25685.9	59079.8	39.1	4.5	3.8	4
A6, k=25	23124.2	52200.9	35.2	12.7	3.7	3.5
A6, k=50	21053.1	47822.7	33.4	28.3	3.6	3.4
A6, k=75	20808.8	47057.9	30.9	46.6	4.4	3.9
A6, k=100	22457	49625.9	32.9	66.3	4.9	4.2
A6, k=250	25035.9	65874.1	37.8	214.9	11	7.9
A6, k=500	24031.8	55021.3	36.9	445.1	12.1	10.5
A6, k=750	22178.7	56826.6	32.5	676.8	11.2	13.4
A6, k=1000	21178.9	54265.5	33.1	892.6	9.5	15.2
A6, k=1500	21610.9	40921.7	33.5	1448.5	9.7	21.3
A6, k=2000	21940.7	49899	33.5	2074.2	10.7	32.3

Table 1: Computational results for 1D - Generated Uniform

Scenario	gen (ms)	build tree (ms)	tree range (ms)	naive range (ms)	fast mode (ms)	naive mode (ms)
Clustered color scenarios						
A7, k=10	4.8	1.8	26.4	3.8	2.1	2.5
A7, k=25	5.4	2.1	27.8	12.8	1.7	2.9
A7, k=50	4.9	1.8	29.6	32.4	1.5	3.7
A7, k=75	4.9	1.7	26.7	48.2	1.1	3.6
A7, k=100	4.8	1.8	28.5	65	1	4
A7, k=250	5.5	1.9	31.4	170.4	0.9	6.4
A7, k=500	4.8	1.6	28.4	301.1	0.8	9.4
A7, k=750	6.9	2.5	34.8	420	0.8	14.8
A8, k=10	191.1	124.3	23.2	3.4	1.9	2
A8, k=25	187.6	129.1	21.9	10	2.1	2.2
A8, k=50	188	128.7	21.8	23.5	2.2	2.5
A8, k=75	211.4	148.1	24.2	39.5	3	3
A8, k=100	192.3	137.7	22.7	55.6	3.6	3.2
A8, k=250	236.6	159.1	25.3	166	3.3	5.1
A8, k=500	191.8	147.3	26.1	348.6	2.3	7.6
A8, k=750	190.8	143.8	24.3	536.6	2.2	10
A8, k=1000	188.3	149.4	23	717.6	1.9	12.7
A8, k=1000	276.2	125.5	33.2	982.3	3	17.5
A8, k=1500	239.3	114.7	27.4	1317.7	2	21.8
A8, k=2000	233	94.2	26.6	1691.2	1.8	27.2
A9, k=10	24786.1	52756.1	34.7	4.6	3.2	3
A9, k=25	21021.9	48728.2	31.7	11.8	2.7	2.7
A9, k=50	21149.5	47184.5	33.1	27.3	3	3
A9, k=75	24835.4	54942.5	33.7	52.9	4.2	4
A9, k=100	23636.4	49507	33.5	68.9	4.8	4.6
A9, k=250	21051.6	41743.9	33.4	191.9	10	6.1
A9, k=500	18177.9	35554.6	28.1	368.1	11.1	7.5
A9, k=750	19663.8	36747	31.2	618.4	11.1	10.8
A9, k=1000	19017.3	38406.4	31.5	862.7	11	14
A9, k=1500	21847.9	57158.6	39.5	1474.6	12.3	22.6
A9, k=2000	19662.1	45902.2	31.8	1880.3	9.9	26
A10, k=10	7.2	2.3	28.2	4.3	3	3.9
A10, k=25	7.4	2.2	30.2	13.8	2.3	3.9
A10, k=50	5.9	1.9	30.3	34.9	1.4	4.6
A10, k=75	7.5	2.4	33.2	57.8	1.4	5.5
A10, k=100	6.8	1.9	34.6	81.9	1.4	5.8
A10, k=250	6.2	1.9	36.7	211.2	1.1	8.2
A10, k=500	6.1	1.8	32.5	338.5	0.8	11
A10, k=750	6	1.7	27.2	400.6	0.7	15.2
A11, k=10	193.5	151.2	24.9	3.1	2.3	2.4
A11, k=25	194.4	154.8	23.8	9.9	2.3	2.6
A11, k=50	189.3	146.8	22.9	23.6	2.4	2.8
A11, k=75	195.6	165.7	23.5	38.3	2.7	3.1
A11, k=100	193.2	163.8	23.4	56.4	3.4	3.4
A11, k=250	191.1	165.6	23.5	156.2	2.2	5.3
A11, k=500	191.5	157.9	24.2	342.6	1.9	7.7
A11, k=750	193.1	167.4	24.1	539	2	10.5
A11, k=1000	204	164.3	23.9	751.2	1.8	13.9
A11, k=1500	241.7	122	28.4	1298.7	1.9	20.4
A11, k=2000	232.5	95.7	28.3	1704.1	1.7	27
A12, k=10	24873	51132.3	35.7	4.5	3.4	3.5
A12, k=25	21088.6	48735.3	33	12.5	3.2	3.1
A12, k=50	21460.9	47522.8	31.2	28.4	3.3	3.3
A12, k=75	25308.3	47099.9	39.6	52.4	5.1	5.1
A12, k=100	24127.8	50086.5	36.8	71.5	5.2	4.8
A12, k=250	21140.3	42213.4	33.3	193.9	9.8	6.5
A12, k=500	18248.9	35615.8	29.1	365.6	10.4	7.9
A12, k=750	19726.1	41426.5	33.9	624.7	9.8	11.1
A12, k=1000	19770	37514	32.1	875.4	10.1	15.3
A12, k=1500	21861.9	55133.3	38	1501.1	9.2	21.9
A12, k=2000	19841.7	44302.1	35.9	1862.5	7.6	26.2

Table 2: Computational results for 1D - Generated Clustered

Scenario	gen (ms)	build tree (ms)	tree range (ms)	naive range (ms)	fast mode (ms)	naive mode (ms)
k fraction of n						
B1, k=1000	201.5	112.7	26.1	746.1	2.6	14.3
B1, k=2000	193.4	79.8	23.4	1423.7	2.6	26.1
B1, k=3000	197.5	78.8	23.7	2046.1	1.9	37
B1, k=4000	190.7	79.4	23.8	2529.4	1.6	48.3
B1, k=5000	193.1	80.7	24.2	2960.1	1.4	59.7
B1, k=6000	197.4	83.7	23	3258.7	1.1	75.4
B1, k=7000	191.3	84	21.1	3399.4	0.8	80.3
B1, k=8000	212.8	98.6	24.3	3785.1	0.6	98.3
B1, k=9000	207.3	101.8	25	3958.8	0.3	112.5
B2, k=1000	201.8	102.6	25.4	748.2	1.8	14.5
B2, k=2000	214.4	109.4	25.4	1517.7	1.7	28.1
B2, k=3000	202.8	110.2	24.8	2151	1.4	39.1
B2, k=4000	195.5	106	25.1	2609.7	1.1	48.1
B2, k=5000	195.8	106.3	24.9	2986.5	0.9	59.1
B2, k=6000	191.2	114.3	23.1	3289.9	0.8	74.1
B2, k=7000	197.3	114	23.9	3489.2	0.6	82.3
B2, k=8000	193.1	115.7	22.7	3661.8	0.4	96.8
B2, k=9000	194.5	119.4	21.6	3808.8	0.2	110.1

Table 3: Computational results for 1D - Additional k frac of n tests

Scenario	gen (ms)	build tree (ms)	tree range (ms)	naive range (ms)	fast mode (ms)	naive mode (ms)
Geolocated temperature scenarios						
C1, k=10	85.1	46.4	21.7	3.1	2.1	2
C1, k=25	76.9	34.4	21.2	9.6	2.1	2.3
C1, k=50	77.3	35.4	20.7	20	2	2.5
C1, k=75	79.3	35	21.7	32.4	2.3	2.7
C1, k=100	76.5	34.6	21.4	44.7	2.2	3.1
C1, k=250	78	34.3	21	124.1	1.8	4.7
C1, k=500	76.4	35	21.1	254.2	1.6	6.9
C1, k=750	77.4	35	20.4	374.5	1.6	9.4
C1, k=1000	77.8	34.8	21.9	503.8	1.5	12.9
C1, k=1500	85.2	44.5	22.4	733	1.6	18
C1, k=2000	80.5	35.2	22	894.4	1.4	22.9
C2, k=10	88.9	48.3	23.7	3.5	2.4	2.3
C2, k=25	82.6	37.2	22.1	10.1	2.1	2.3
C2, k=50	82.4	37.6	22.1	21.1	2.2	2.7
C2, k=75	79.4	35.2	22.2	32.2	2.3	2.8
C2, k=100	80.4	35.2	21.6	45	2.3	3.4
C2, k=250	80.4	35.2	22.5	126.8	1.9	4.7
C2, k=500	80.4	36.5	22.2	264.6	1.6	7.3
C2, k=750	79	35.6	20.7	382.6	1.8	10.8
C2, k=1000	81.2	36.9	22.5	516.3	1.6	12.9
C2, k=1500	90.9	46.3	23.3	766.4	1.7	18.6
C2, k=2000	81.3	35.8	21.5	927.4	1.4	22.8

Table 4: Computational results for 1D - Temperature