

Project3

A Real Application Parallel Challenge

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1. Tell what machine you ran this on

CyberDuck(rabbit.engr.oregonstate.edu)

2. Tell what operating system you were using

MacOS

3. Tell what compiler you used

Apple clang version 15.0.0 (clang-1500.1.0.2.5)

Target: arm64-apple-darwin22.6.0

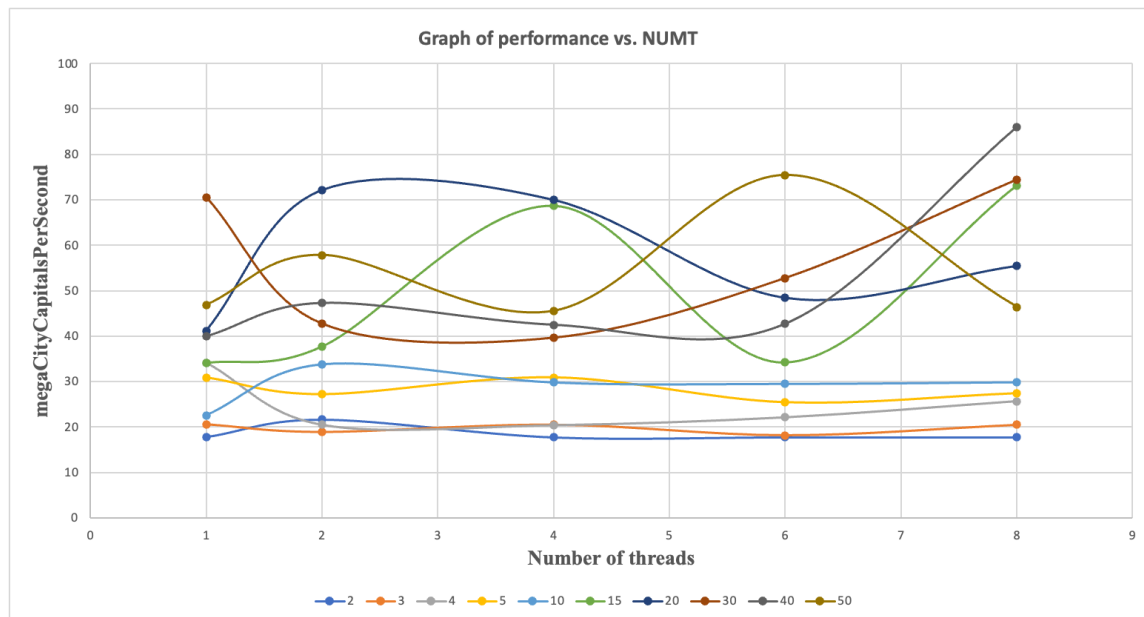
Thread model: posix

4. Include the table of performance data.

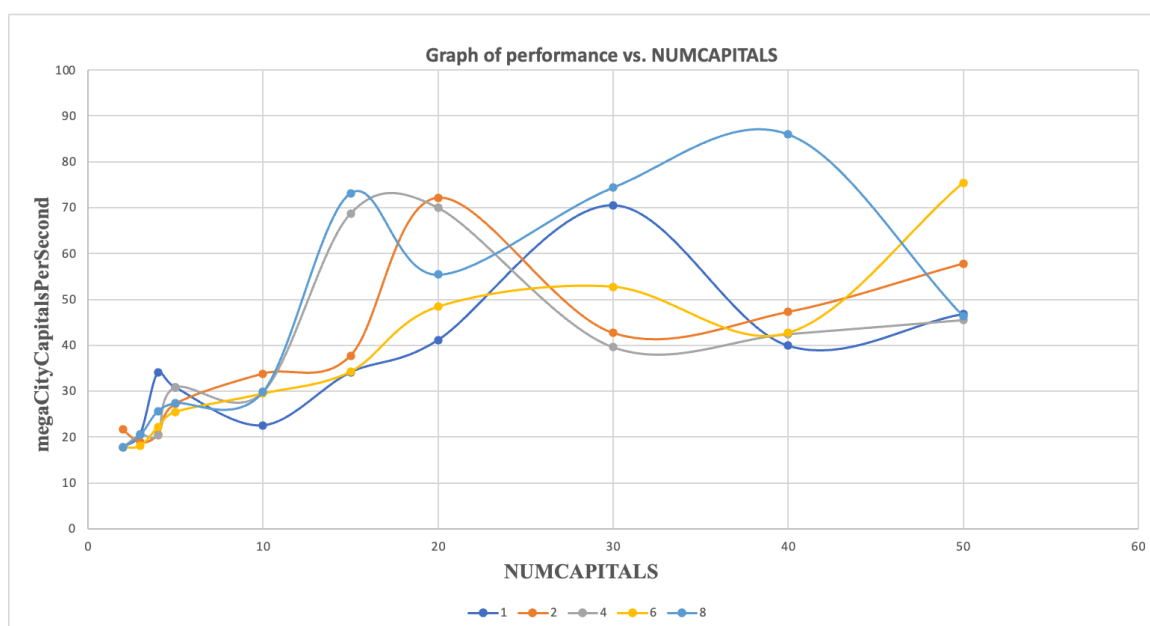
CSV	NUMT					
NUMCAPITALS	1	2	4	6	8	Sum
2	17.828	21.636	17.752	17.77	17.756	92.742
3	20.608	18.872	20.519	18.114	20.486	98.599
4	34.092	20.502	20.413	22.139	25.673	122.819
5	30.836	27.23	30.862	25.49	27.44	141.858
10	22.531	33.835	29.801	29.484	29.845	145.496
15	34.093	37.712	68.666	34.22	73.167	247.858
20	41.13	72.181	70	48.383	55.436	287.13
30	70.566	42.713	39.618	52.755	74.418	280.07

40	39.913	47.271	42.458	42.693	86.056	258.391
50	46.834	57.827	45.523	75.404	46.408	271.996
Sum	358.431	379.779	385.612	366.452	456.685	1946.959

5. Include a graph of performance vs. NUMT with the colored curves being NUMCAPITALS.



6. Include a graph of performance vs. NUMCAPITALS cities with the colored curves being NUMT.



7. Tell us what you discovered by doing this. What patterns are you seeing in the graphs?

The graphs illustrate the performance of a computational task measured in megacity capitals per second, emphasizing how it varies with changes in the number of threads (NUMT) and the number of capitals (NUMCAPITALS). The data shows significant volatility and non-linear relationships, where performance peaks at certain thread counts and capital numbers due to factors like load balancing and threading overhead. For instance, performance increases at four threads for NUMCAPITALS at 10 and 30, suggesting optimal data partitioning. However, increasing threads or capitals beyond certain points show declining returns, likely due to increased synchronization. These insights suggest that tuning the number of threads and capitals can significantly impact performance, pointing towards strategies for optimizing computational efficiency by adjusting parallel processing parameters.

Extra Credit:

904	9:	82.42	28.83	Gainesville	FL
905	10:	80.43	34.46	Columbia	SC
906	11:	114.74	36.4	NorthLasVeg	NV
907	12:	85.94	40.5	Fishers	IN
908	13:	112.00	33.37	Tempe	AZ
909	14:	122.26	47.55	Renton	WA
910	15:	117.33	34.47	Victorville	CA
911	16:	117.44	34.03	JurupaValley	CA
912	17:	108.55	45.79	Billings	MT
913	18:	101.58	33.02	Lubbock	TX
914	19:	88.97	41.99	Rockford	IL
915	20:	81.06	41	Akron	OH
916	21:	91.08	31.55	BatonRouge	LA
917	22:	88.77	37.08	Clarksville	TN
918	23:	104.93	39.71	Denver	CO
919	24:	122.17	37.92	Berkeley	CA
920	25:	71.21	42.29	Cambridge	MA
921	26:	117.13	32.95	SanDiego	CA
922	27:	95.18	29.78	Pasadena	TX
923	28:	77.54	43.03	Rochester	NY
924	29:	76.90	39.01	Washington	DC
925	30:	94.34	44.32	Minneapolis	MN
926	31:	75.31	40.3	Philadelphia	PA
927	32:	116.40	43.6	Meridian	ID
928	33:	121.67	37.41	SanJose	CA
929	34:	97.61	30.46	RoundRock	TX
930	35:	95.04	38.65	Olathe	KS
931	36:	120.93	39.1	Roseville	CA
932	37:	111.98	40.69	WestValleyC	UT
933	38:	73.03	41.77	Waterbury	CT
934	39:	111.65	40.25	Provo	UT
935	40:	117.17	33.58	Murrieta	CA
936	41:	117.33	47.67	Spokane	WA
937	42:	119.63	34.47	Ventura	CA
938	43:	106.64	33.64	LasCruces	NM
939	44:	80.40	26.36	CoralSprings	FL
940	45:	117.93	33.85	Fullerton	CA
941	46:	118.38	34.23	Burbank	CA
942	47:	96.94	33.22	Frisco	TX
943	48:	122.58	45.04	Salem	OR
944	49:	122.87	38.09	SantaRosa	CA
945		8	50	46.736	