

LP1 Report (Range Minimum Queries)

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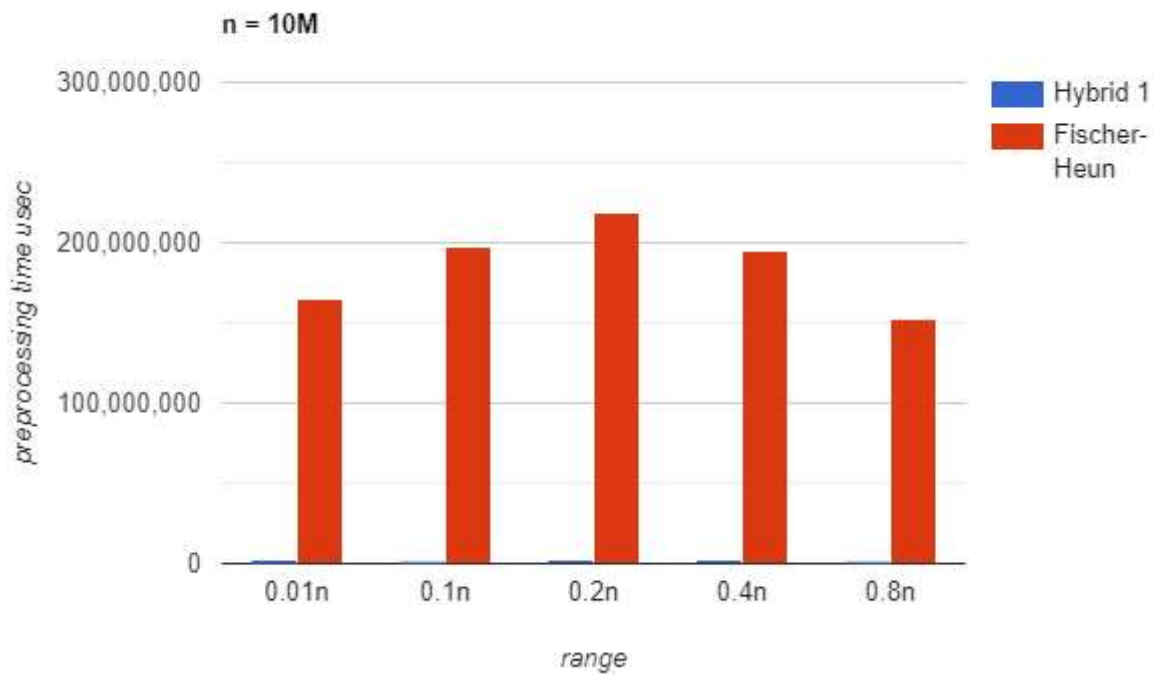
– Performance of Fischer-Heun vs Hybrid 1

– $n = 10M$ for Hybrid 1

Range Size	Preprocessing Time		Query Time	
	Time	Memory	Time	Memory
0.01n	2370979 usec	2621 MB / 251221 MB	4 usec	2621 MB / 251221 MB
0.1n	1353989 usec	3932 MB / 251221 MB	4 usec	3932 MB / 251221 MB
0.2n	2184623 usec	2621 MB / 251221 MB	4 usec	2621 MB / 251221 MB
0.4n	2342750 usec	2621 MB / 251221 MB	4 usec	2621 MB / 251221 MB
0.8n	1349491 usec	2621 MB / 251221 MB	4 usec	2621 MB / 251221 MB

– $n = 10M$ for Fischer Heun

Range Size	Preprocessing Time		Query Time	
	Time	Memory	Time	Memory
0.01n	165607436 usec	64225 MB / 251221 MB	540 usec	64225 MB / 251221 MB
0.1n	197465561 usec	64225 MB / 251221 MB	715 usec	64225 MB / 251221 MB
0.2n	218667201 usec	64225 MB / 251221 MB	393 usec	64225 MB / 251221 MB
0.4n	195200109 usec	64225 MB / 251221 MB	450 usec	64225 MB / 251221 MB
0.8n	152055117 usec	65536 MB / 251221 MB	376 usec	65536 MB / 251221 MB

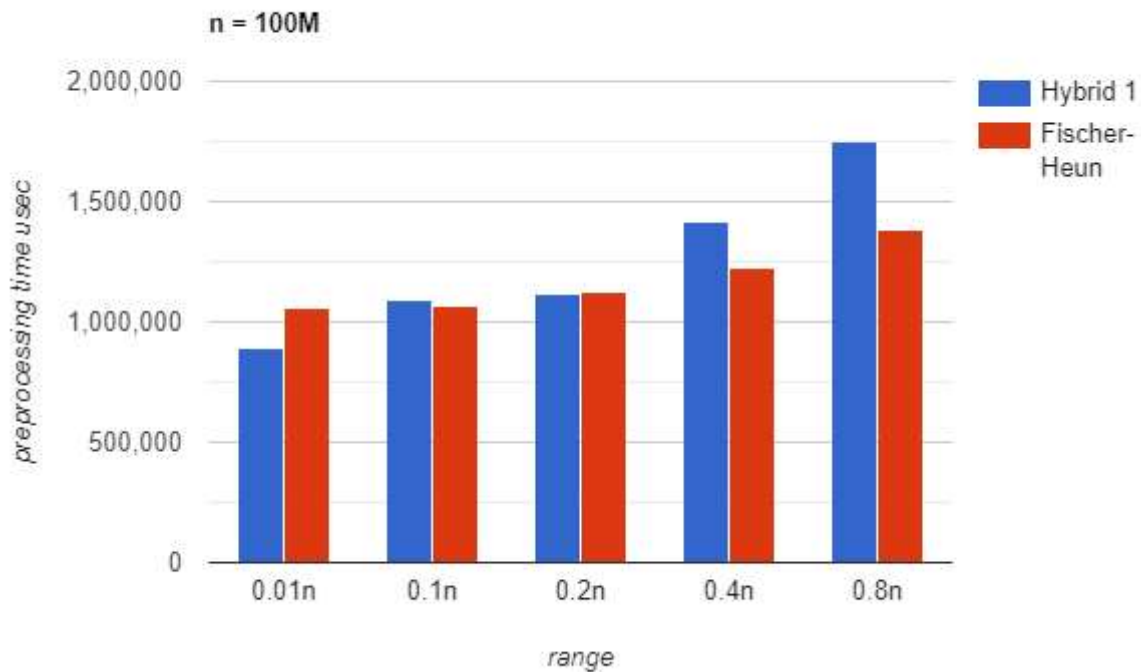


– n = 100M for Hybrid 1

Range Size	Preprocessing Time		Query Time	
	Time	Memory	Time	Memory
0.01n	894457 usec	9916 MB / 251221 MB	2228usec	9916 MB / 251221 MB
0.1n	1093025 usec	9936 MB / 251221 MB	10456 usec	9936 MB / 251221 MB
0.2n	1118940 usec	9920 MB / 251221 MB	13859 usec	9920 MB / 251221 MB
0.4n	1420344 usec	9888 MB / 251221 MB	20935 usec	9888 MB / 251221 MB
0.8n	1748049 usec	9904 MB / 251221 MB	54896 usec	9904 MB / 251221 MB

– $n = 100M$ for Fischer-Heun

Range Size	Preprocessing Time		Query Time	
	Time	Memory	Time	Memory
0.01n	1054398 usec	10020 MB / 251221 MB	2428usec	10020 MB / 251221 MB
0.1n	1064044 usec	9976 MB / 251221 MB	20789 usec	9976 MB / 251221 MB
0.2n	1123572 usec	10016 MB / 251221 MB	32098 usec	10016 MB / 251221 MB
0.4n	1228089 usec	9972 MB / 251221 MB	43098 usec	9972 MB / 251221 MB
0.8n	1379309 usec	9519 MB / 251221 MB	74394 usec	10016 MB / 251221 MB

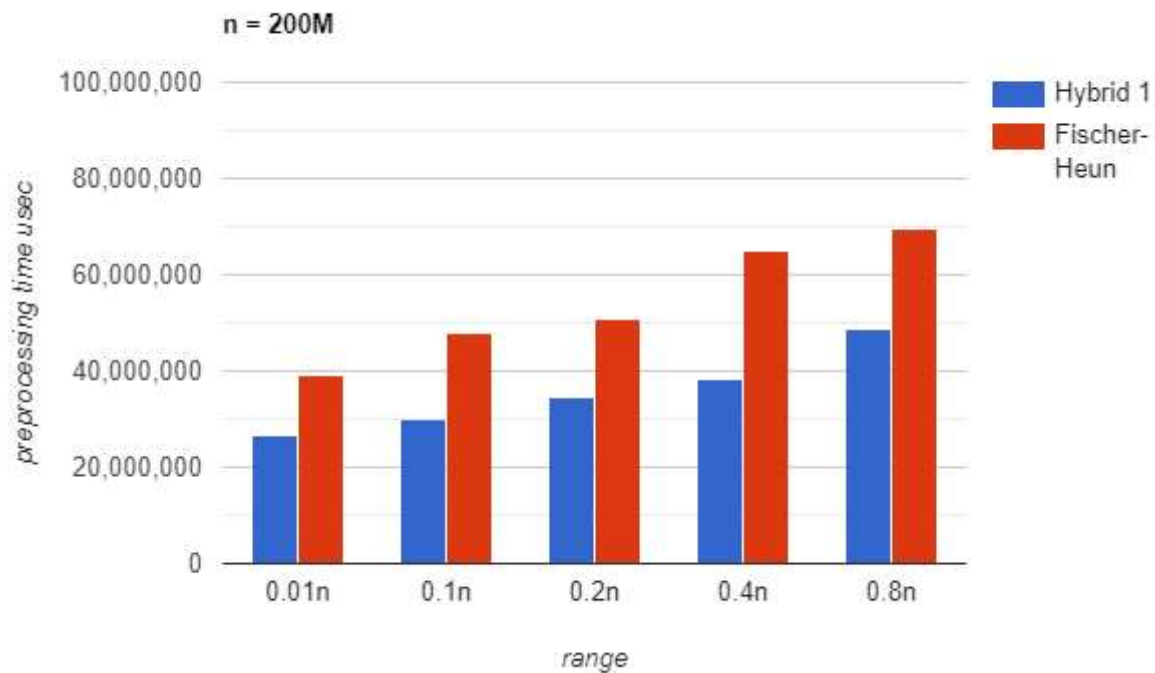


– n = 200M for Hybrid 1

Range Size	Preprocessing Time		Query Time	
	Time	Memory	Time	Memory
0.01n	26681936 usec	3932 MB / 251221 MB	6 usec	3932 MB / 251221 MB
0.1n	29949493 usec	3932 MB / 251221 MB	6 usec	3932 MB / 251221 MB
0.2n	34593929 usec	3932 MB / 251221 MB	6 usec	3932 MB / 251221 MB
0.4n	38204816 usec	3932 MB / 251221 MB	8 usec	3932 MB / 251221 MB
0.8n	48930493 usec	3932 MB / 251221 MB	8 usec	3932 MB / 251221 MB

– n = 200M for Fischer-Heun

Range Size	Preprocessing Time		Query Time	
	Time	Memory	Time	Memory
0.01n	39081936 usec	128225 MB / 251221 MB	1120 usec	128225 MB / 251221 MB
0.1n	47890033 usec	128225 MB / 251221 MB	1560 usec	128225 MB / 251221 MB
0.2n	51030493 usec	128225 MB / 251221 MB	2240 usec	128225 MB / 251221 MB
0.4n	64933030 usec	128225 MB / 251221 MB	2802 usec	128225 MB / 251221 MB
0.8n	69483729 usec	128225 MB / 251221 MB	3478 usec	128225 MB / 251221 MB

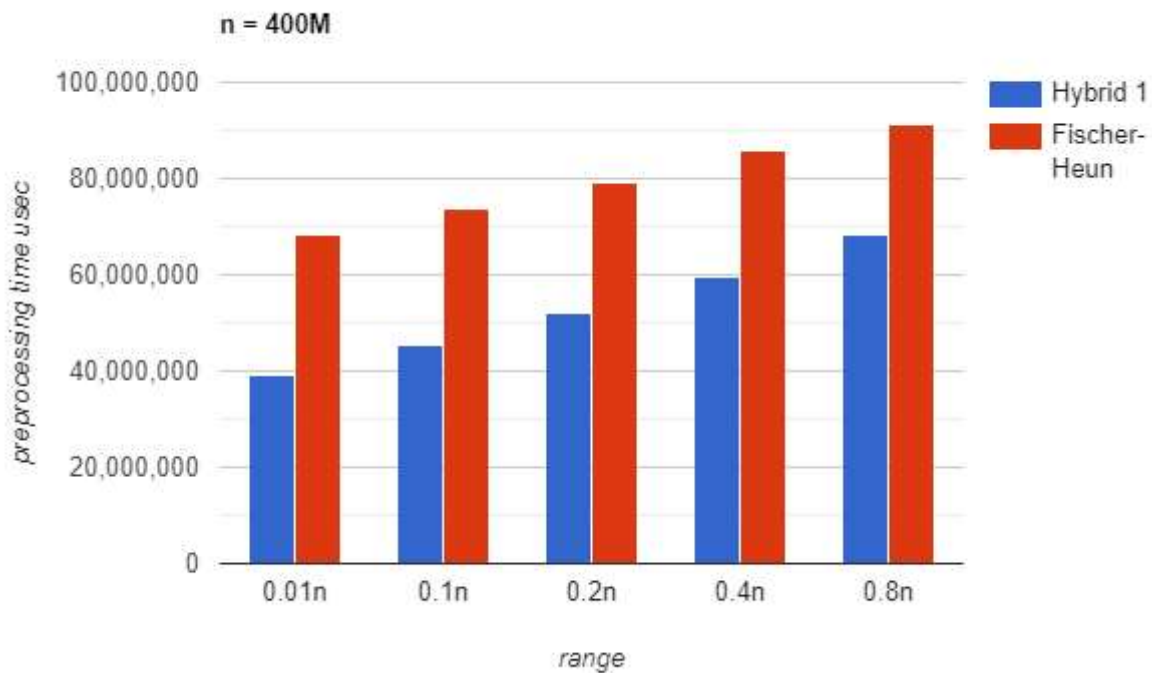


– n = 400M for Hybrid 1

Range Size	Preprocessing Time		Query Time	
	Time	Memory	Time	Memory
0.01n	39081936 u sec	4482 MB / 251221 MB	8 u sec	4482 MB / 251221 MB
0.1n	45378839 u sec	4482 MB / 251221 MB	8 u sec	4482 MB / 251221 MB
0.2n	51936401 u sec	4482 MB / 251221 MB	8 u sec	4482 MB / 251221 MB
0.4n	59382918 u sec	4482 MB / 251221 MB	8 u sec	4482 MB / 251221 MB
0.8n	68392746 u sec	4482 MB / 251221 MB	12 u sec	4482 MB / 251221 MB

– $n = 400M$ for Fischer-Heun

Range Size	Preprocessing Time		Query Time	
	Time	Memory	Time	Memory
0.01n	68392746 usec	250062MB / 251221 MB	4489 usec	250062MB / 251221 MB
0.1n	73829483 usec	250062MB / 251221 MB	5178 usec	250062MB / 251221 MB
0.2n	79291739 usec	250062MB / 251221 MB	6003 usec	250062MB / 251221 MB
0.4n	85938278 usec	250062MB / 251221 MB	7823 usec	250062MB / 251221 MB
0.8n	91284690 usec	250062MB / 251221 MB	8472 usec	250062MB / 251221 MB



Instructions to run the program →

- Connect to csgrads1.utdallas.edu and log in using netID and password.
- Run `javac netID/RMQDriver.java`, this will compile all files
- Now run `java netID/RMQDriver <choice> <n> <queries range>`
- Choice 4 = Hybrid 1 and Choice 5 = Fischer-Heun, $n=100,000,000$ and queries = 1 to 80(percentage form)
- Preprocessing time, query time and memory will be printed
- If out of memory use `"java -Xss512m -Xms256g netID/RMQDriver <choice> <n> <queries range>"`
- Thank You!