GQM Metrics Tables

1 Dining Philosophers

Table 1: GQM metrics for the Dining Philosophers problem.

Metric	Rust	Go	OpenMP	Pthreads
		GO1: Expressiveness		
M-1.1.1 NLA	3	1	0	2
M-1.1.2 NCA	19	16	8	11
M-1.1.3 TCL	Arc, Mutex, Condvar, thread::spawn, thread::sleep, lock, unwrap, notify_all	go, sync.Mutex, sync.WaitGroup, Lock, Unlock, TryLock, Add, Done, Wait	parallel, critical, atomic, flush	pthread_t, sem_t, sem_wait, sem_post, pthread_create, pthread_join
M-1.2.1 SUA	13	15	7	8
M-1.2.2 SSE	High	Medium-High	High	Medium
M-1.3.1 CMI	Threads + Mutex/Condvar	Goroutines + Mutex	Threads with OpenMP	Threads + Semaphores
M-1.3.2 CMF	Flexible	Flexible	Restricted	Restricted
		GO2: Effort		
M-2.1.1 LOC	73	62	79	77
M-2.1.2 LOC-P	15	13	8	10
M-2.2.1 CC	3	4	14	7
M-2.2.2 ACU	Medium	Medium	Medium	Medium
M-2.3.1 NOPC	19	16	8	11
M-2.3.2 PELU	3	1	0	0

2 Producer and Consumer

Table 2: GQM metrics for the Producer-Consumer problem.

Metric	Rust	Go	OpenMP	Pthreads
GO1: Expressiveness				
M-1.1.1 NLA	1	1	1	1
M-1.1.2 NCA	29	17	5	10
M-1.1.3 TCL	Arc, Mutex, Cond-var, spawn, join, wait, notify_one, lock, unwrap, drop	go, Mutex, Lock, Unlock, Cond, newCond, Wait, Signal, Waitgroup, Add, Done, Wait	parallel, critical, flush	pthread_mutex, pthread_create
M-1.2.1 SUA	10	6	4	
M-1.2.2 SSE	High	High	High	Moderate
M-1.3.1 CMI	Threads + Mutex/Condvar	Goroutines + Mutex/Cond	Threads with OpenMP	Threads + Mutex
M-1.3.2 CMF	Flexible	Flexible	Restricted	Flexible
GO2: Effort				
M-2.1.1 LOC	81	80	65	75
M-2.1.2 LOC-P	29	17	7	10
M-2.2.1 CC	8	6	7	6
M-2.2.2 ACU	Low	Low	Medium	Medium
M-2.3.1 NOPC	29	17	7	10
M-2.3.2 PELU	1	8	1	0

3 Readers and Writers

Table 3: GQM metrics for the Readers-Writers problem.

Metric	Rust	Go	OpenMP	Pthreads
GO1: Expressiveness				
M-1.1.1 NLA	4	1	0	2
M-1.1.2 NCA	41	33	9	8
M-1.1.3 TCL	Arc, Mutex, Cond-var, thread::spawn, thread::sleep, lock, unwrap, notify_one, notify_all	go, Mutex, Lock, Unlock, Cond, NewCond, Wait, Signal, Broadcast, WaitGroup, Add, Done, Wait	parallel, critical, atomic, flush	pthread_mutex_t, pthread_mutex_init, pthread_mutex_lock, pthread_mutex_unlock, pthread_create, pthread_join, sem_t, sem_init, sem_wait, sem_post
M-1.2.1 SUA	29	19	8	7
M-1.2.2 SSE	High	Medium-High	High	Medium
M-1.3.1 CMI	Threads + Mutex/Condvar	Goroutines + Mutex/Cond	Threads with OpenMP	Threads + Mutex + Semaphores
M-1.3.2 CMF	Flexible	Flexible	Restricted	Restricted
GO2: Effort				
M-2.1.1 LOC	91	76	90	66
M-2.1.2 LOC-P	27	26	9	15
M-2.2.1 CC	13	9	9	8
M-2.2.2 ACU	Medium	Medium	Medium	Medium
M-2.3.1 NOPC	41	33	9	8
M-2.3.2 PELU	4	1	0	0

4 Sleeping Barber

Table 4: GQM metrics for the Sleeping Barber problem.

Metric	Rust	Go	OpenMP	Pthreads
GO1: Expressiveness				
M-1.1.1 NLA	3	1	0	2
M-1.1.2 NCA	39	16	7	6
M-1.1.3 TCL	Arc, Mutex, Condvar, thread::spawn, thread::sleep, lock, unwrap, notify_one	sync.Mutex, sync.Cond, sync.WaitGroup, Lock, Unlock, Wait, Broadcast, Signal	parallel, critical, atomic, flush, section, parallel for	pthread_t, pthread_create, pthread_exit, sem_t, sem_init, sem_wait, sem_post
M-1.2.1 SUA	30	15	2	5
M-1.2.2 SSE	High	Medium-High	High	Medium
M-1.3.1 CMI	Threads + Mutex/Condvar	Goroutines + Mutex/Condvar	Threads with OpenMP	Threads + Semaphores
M-1.3.2 CMF	Flexible	Flexible	Restricted	Medium
GO2: Effort				
M-2.1.1 LOC	81	84	92	52
M-2.1.2 LOC-P	29	16	6	12
M-2.2.1 CC	7	7	14	3
M-2.2.2 ACU	Medium	Medium	Medium	Medium
M-2.3.1 NOPC	39	16	7	6
M-2.3.2 PELU	3	1	0	0

5 Smokers Problem

Table 5: GQM metrics for the Smokers Problem.

Metric	Rust	Go	OpenMP	Pthreads
GO1: Expressiveness				
M-1.1.1 NLA	3	2	0	2
M-1.1.2 NCA	11	17	8	26
M-1.1.3 TCL	crossbeam::channel, thread::spawn, thread::sleep, send, recv, try_recv	go, make(chan), close, select, sync.WaitGroup, Add, Done, Wait	parallel, critical, atomic, flush, section	pthread_create, sem_init, sem_wait, sem_post
M-1.2.1 SUA	13	14	3	15
M-1.2.2 SSE	High	High	High	Medium
M-1.3.1 CMI	Threads + Channels (crossbeam)	Goroutines + Channels	Threads with OpenMP	Threads + Semaphores
M-1.3.2 CMF	Flexible	Flexible	Restricted	Medium
GO2: Effort				
M-2.1.1 LOC	78	96	99	95
M-2.1.2 LOC-P	11	17	8	31
M-2.2.1 CC	14	11	10	35
M-2.2.2 ACU	Medium	Medium	Medium	Medium
M-2.3.1 NOPC	11	17	8	26
M-2.3.2 PELU	3	1	0	0