SCICOMP301 OPERATING SYSTEMS
PROJECT 3
THREADS: A MICE & CHEESE PROBLEM

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"THIS IS ALL MY OWN WORK. I HAVE NOT KNOWINGLY ALLOWED OTHERS TO COPY MY WORK.
THIS WORK HAS NOT BEEN SUBMITTED FOR ASSESSMENT IN ANY OTHER CONTEXT."

TECHNOLOGY PLATFORM

macOS Monterey Version 12.6
MacBook Air (M1)
CPU chip: Apple M1
Memory: 16 GB
Total Number of Cores: 8 (4 performance and 4 efficiency)
Eclipse Version: 2022-03 (4.23.0)
Java version: 17

TABLE A: TIME INTERVAL

box with cheese @	1 mouse		4 mice		8 mice	
	Expected	Observed	Expected	Observed	Expected	Observed
(0,0)	100	105	100	103	100	105
(1,1)	1000	1041	1000	1039	200	208
(2,2)	1900	1978	300	313	300	315
(3,3)	2800	2921	1200	1248	400	419
(4,4)	3700	3858	500	524	500	519
(5,5)	4600	4783	1400	1452	600	625
(6,6)	5500	5752	700	736	700	725
(7,7)	6400	6657	1600	1679	800	828
Average	3250	3386.875	850	886.75	450	468

TABLE B: TIME INTERVAL AND NUMBER OF BOX OPENINGS

box with cheese @	8 mice condition			
	observed time taken		observed counts of box openings	
	unsynchronized	Re-run (synch.)	unsynchronized	Re-run (synch.)
(0,0)	105	106	6	8
(1,1)	208	209	13	16
(2,2)	315	314	22	24
(3,3)	419	420	25	32
(4,4)	519	521	33	40
(5,5)	625	624	41	48
(6,6)	725	725	49	56
(7,7)	828	829	63	64
Average	468	468.5	31.5	36

CONCLUSION

- IN CONCURRENT PROGRAMMING THE AVERAGE TIME WILL DECRESE WHEN THE NUMBER OF THREADS INCREASE.
- THERE IS ALWAYS A DIFFERENCE BETWEEN THE EXPECTED TIME AND OBSERVED TIME.
- IN THE SYNCHRONISED VERSION, ALL THREADS WAIT UNTIL THEY ARE IN THE SAME STATE AND THEN FURTHER THE SEARCH.