

Project 2 Analytics - fdougher							
TM used Nondeterministic Deterministic	String used	Result (Accepted/rejected, ran too long)	depth of tree	Number of configurations explored	Average Configs explored / depth of tree for machine	average nondeterminism (Average number of values associated with each key)	comments
Nondeterministic A plus (aPlus.csv)	aabaa	rejected	2	4	1.94 $(4/2 + 11/6 + 41/21 + 40/2) / 4$	1.5	A trend I've noticed throughout each DTM vs NTM is how the depth remains consistent when input is consistent, however NTM's explore many more configurations and are therefore more complex. It begs the question of why ever use an NTM if a DTM could be used.
	aaaaa	accepted	6	11			
	aaaaaaaaaaaa aaaaaaaaa (20 a)	accepted	21	41			
	aaaaaaaaaaaa aaaaaaaaab	rejected	20	40			
Deterministic A Plus (detAPlus.csv)	aabaa	rejected	2	2	1	1	
	aaaaa	accepted	6	6			
	aaaaaaaaaaaa aaaaaaaaa (20 a)	accepted	21	21			
	aaaaaaaaaaaa aaaaaaaaab	rejected	20	20			
Nondeterministic Equal Number of 0s and 1s (euqal_01s.csv)	100110	accepted	25	39	1.34	1.0526	Max Depth Exceeded was encountered with particularly large input strings and was especially prominent in NTM's,
	10101010111 111000011111 011011	rejected	283	376			

	10000000000 00000000000 00000000000 00001	rejected	114	119			where the number of branches grows exponentially requiring large depths and steps to compute.
	111001011101 11010000111 00101010000 11001010000 11011	Max depth exceeded Accepted (when max depth modified)	1401	2003			
Deterministic Equal Number of 0s and 1s (euqal_01s_DTM.csv)	100110	accepted	25	25	1	1	
	10101010111 11100001111 011011	rejected	283	283			
	10000000000 00000000000 00000000000 00001	rejected	114	114			
	111001011101 11010000111 00101010000 11001010000 11011	Max depth exceeded Accepted (when max depth modified)	1401	1401			
Nondeterministic abc_star (abc_star.csv)	aaabbbccc	accepted	10	31	3.21	2.2857	This TM in particular let me see that average nondeterminism serves as an indicator of
	aaaaaaaaaaa bcccc	accepted	17	59			

	aaaaaaaabbb bbbbcccac	rejected	18	62			computational branching in nondeterministic machines, and higher values correlate with more computationally intense tasks. For instance, I created the column Average Configs explored / depth of tree for machine and we can see correlation between this and average nondeterminism.
	aaaaaaaabbb bbbbbbbbbbb bbccccccccc cccccc	accepted	41	116			
Machine: {w w=w^r, where w^r is the reverse, aka palindrome} Nondeterministic (abPalindrome.csv)	ababbaaaa	rejected	26	105	2.86	1.125	
	abbabba	accepted	11	22			
	abbaabba	accepted	11	32			
	aababaa	accepted	4	10			
Machine: {w w=w^r, where w^r is the reverse, aka palindrome} Deterministic (abPalindrome_DTM.csv)	ababbaaaa	rejected	28	28	1	1	
	abbabba	accepted	38	38			
	abbaabba	accepted	45	45			
	abababababa baba	accepted	138	138			
{w w has twice the number of 0's as it does 1's} Deterministic 2x0_DTM.csv	110000	accepted	23	23	1	1	
	10010010	rejected	22	22			
	100100100	accepted	40	40			

