

# Project 2 Teamwork Kaila - kbryant3

Version 1 9/11/24

A **separate copy** of this template should be filled out and submitted by each student, regardless of the number of students on the team. Also change the title of this template to "Project x Teamwork <team> - <netid>"

1	Team Name: KB																
2	Individual name: Kaila Bryant																
3	Individual netid: kbryant3																
4	Other team members names and netids: N/A																
5	Link to github repository: <a href="https://github.com/kailabryant/Project2-TOC">https://github.com/kailabryant/Project2-TOC</a>																
6	Overall project attempted, with sub-projects: Tracing NTM																
7	<div>List of included files (if you have many files of a certain type, such as test files of different sizes, list just the folder): (Add more rows as necessary)</div> <table border="1"><thead><tr><th>File/folder Name</th><th>File Contents and Use</th></tr></thead><tbody><tr><td colspan="2">Code Files</td></tr><tr><td>ntm_tracer.py</td><td>This file contains the main code for the NTM tracer. The code in this file was the driver code that contained the BFS algorithm of the NTM config tree.</td></tr><tr><td>turing_machine.py</td><td>This file contains the helper code that in used to make ntm_tracer.py</td></tr><tr><td colspan="2">Test Files</td></tr><tr><td>aplus.csv</td><td>This csv file contains the information for a NTM that recognizes all strings of any # of a's and rejects the empty string. This file was used to test the functionality of ntm_tracer.py.</td></tr><tr><td>composite.csv</td><td>This csv file contains the information for a NTM that recognizes strings of 1's with the length of the string being a composite number. This file was used to test the functionality of ntm_tracer.py.</td></tr><tr><td>palindrome.csv</td><td>This csv file contains the information for a NTM that recognizes all strings that are palindromes over the alphabet a,b. This file was used to test the functionality of ntm_tracer.py.</td></tr></tbody></table>	File/folder Name	File Contents and Use	Code Files		ntm_tracer.py	This file contains the main code for the NTM tracer. The code in this file was the driver code that contained the BFS algorithm of the NTM config tree.	turing_machine.py	This file contains the helper code that in used to make ntm_tracer.py	Test Files		aplus.csv	This csv file contains the information for a NTM that recognizes all strings of any # of a's and rejects the empty string. This file was used to test the functionality of ntm_tracer.py.	composite.csv	This csv file contains the information for a NTM that recognizes strings of 1's with the length of the string being a composite number. This file was used to test the functionality of ntm_tracer.py.	palindrome.csv	This csv file contains the information for a NTM that recognizes all strings that are palindromes over the alphabet a,b. This file was used to test the functionality of ntm_tracer.py.
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	Output Files	
	aplus_output_kb.png	Shows the output of running ntm_tracer.py on aplus.csv on the input "aaa" The output shows the tree depth, total transitions, and how many steps it took for the machine to accept the string.
	composite_output_kb.png	Shows the output of running ntm_tracer.py on composite.csv on the input "111111" The output shows the tree depth, total transitions, and how many steps it took for the machine to accept the string.
	palindrome_output_kb.png	Shows the output of running ntm_tracer.py on palindrome.csv on the input "aabaa" The output shows the tree depth, total transitions, and how many steps it took for the machine to accept the string.
	Plots (as needed)	
	N/A	N/A
8	<b>Individual Student time (in hours) to complete:</b> 9-10 hours	
9	<b>Your specific activities and responsibilities</b> Since I worked alone, I was responsible for writing all the code in ntm_tracer.py and figuring out what csv files I was planning on using in order to test the functionality of my code. I solely managed the development of the code. I split up the code throughout multiple days. I first worked on developing pseudocode for the overall functionality of the program and hand-traced examples to ensure the logic translated from paper to code. After I felt confident in my logic, I tried coding the main functionality before focusing on formatting the output, including backtracking to print the entire computation tree	
10	<b>What was personally learned (topic, programming, algorithms)</b> I think this project helped further my understanding on nondeterministic behavior and computation. Additionally, I learned more about the differing complexity of computation given different inputs. It was also good practice for implementing a BFS algorithm and applying that to the logic of NTMs and their behaviors and attributes.	
11	<b>How team was organized, and what might be improved.</b> Since I worked alone, I had the responsibility of the entire project so there were not a lot of ways my team could be organized. But for what might have been improved, I would say it would've been worthwhile to start the project a little earlier.	
12	<b>Any additional material:</b> Overall, the project was an interesting way to apply what we have covered in class in a code format and it was useful to see the full computation tree printed and the path a given NTM took given a certain input.	

