

Project Teamwork mzitella - mzitella

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: mzitella | | | | | | | | |
|----------------------|---|------------------|-----------------------|------------|--|----------------------|---|------------|--|
| 2 | Madeline Zitella | | | | | | | | |
| 3 | mzitella | | | | | | | | |
| 4 | Other team members names and netids: N/A | | | | | | | | |
| 5 | Link to github repository: https://github.com/MadelineZitella/Theory-of-Computing-NTM-Tracing-Project | | | | | | | | |
| 6 | <p>Overall project attempted:</p> <ul style="list-style-type: none">- Given a NTM and a string, create a program to trace all possible paths the NTM might have taken and stop at an accept, reject, or when the maximum depth is reached. (i.e. Program 1 from project instructions) <p>Sub-projects:</p> <ul style="list-style-type: none">- Parse the NTM .csv file, including the header information and state transitions- Get all the possible configurations at each level and return as a list.- Use Breadth_First Search to explore every possible path and maintain a tree of configurations- Calculate nondeterminism | | | | | | | | |
| 7 | <p>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)</p> <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>traceNTM_mzitella.py</td><td><p>This is the main program file that parses the .csv TM file, handles tape movement by exploring all possible configurations using BFS, and returns the accepting path if there is one. All output is printed to the terminal. To use this file, run:</p><pre>python3 ./traceNTM_mzitella.py <tm_file> <input_string></pre></td></tr><tr><td colspan="2">Test Files</td></tr></tbody></table> | File/folder Name | File Contents and Use | Code Files | | traceNTM_mzitella.py | <p>This is the main program file that parses the .csv TM file, handles tape movement by exploring all possible configurations using BFS, and returns the accepting path if there is one. All output is printed to the terminal. To use this file, run:</p> <pre>python3 ./traceNTM_mzitella.py <tm_file> <input_string></pre> | Test Files | |
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|----|--|---|
| | abc_star_mzitella.csv | NTM for a*b*c* formatted as a csv file. |
| | a_plus_mzitella.csv | NTM for a+ formatted as a csv file. |
| | Output Files | |
| | abc_star_output_example_mzitella.txt | Output for program running on abc_star_mzitella.csv with the string aaaaabccccc |
| 8 | Individual Student time (in hours) to complete: ~5 | |
| 9 | Your specific activities and responsibilities: All (worked individually) | |
| 10 | <p>What was personally learned (topic, programming, algorithms)</p> <p>I learned more about constructing a BFS, and it was interesting to learn about a new application of a very common search technique. Contrasting this project with project 1, where a depth-first search algorithm worked better for the nature of the problem, has demonstrated applications of when to use what search method which has also helped my understanding of both search methods. I also learned more about NTM tracing behavior by visualizing each possible configuration as nodes of a tree. This has helped me ascertain a more complete understanding of how these machines operate.</p> | |
| 11 | <p>How team was organized, and what might be improved.</p> <p>N/A (worked individually)</p> | |
| 12 | Any additional material: (see readme for terminal screenshots) | |