Project TeamworkTemplate

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: AJC (originally ‘Andrew the Brute’)
2	Individual name: Andrew Cotaj
3	Individual netid: acotaj
4	Other team members names and netids: N/A
5	Link to github repository: https://github.com/AdrewC2026/Project1-TOC
6	Overall project attempted, with sub-projects: SAT, Brute Force
7	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)

File/folder Name	File Contents and Use
Code Files	
	├── plot_final_runtime_AJC.py ├── plot_runtime_AJC.py
Test Files	
	├── input │ ├── 2SAT.cnf │ ├── cnffile.cnf │ └── kSAT.cnf
Output Files	
	├── results │ ├── brute_force_2SAT_sat_solver_results_AJC.csv │ ├── brute_force_cnffile_sat_solver_results_AJC.csv │ └── brute_force_kSAT_sat_solver_results_AJC.csv
Plots (as needed)	
	├── plots_AJC │ ├── bruteforce_runtime_2SAT_plot_AJC.png

	│ ├── bruteforce_runtime_cnffile_plot_AJC.png │ ├── bruteforce_runtime_kSAT_plot_AJC.png │ └── final_bruteforce_runtime_AJC.png
8	Individual Student time (in hours) to complete: ~10-11 hours
9	Your specific activities and responsibilities Worked independently = everything
10	What was personally learned (topic, programming, algorithms) As I played around with the instances of different variable sizes, it became apparent just how fast and how dramatically the runtime scaled as the number of variables increased. I initially thought my program was stuck or had a bug, but I then came to realize that the solver was doing exactly what brute force requires: checking all 2^n possible assignments. Even modest increases from 16 to 20 variables produced massive jumps in runtime, which helped me internalize why brute-force SAT is considered impractical and why SAT is a canonical NP-complete problem.
11	How team was organized, and what might be improved. Individual project - N/A
12	Any additional material: In *sat.py*, I included a limit variable for variable size so that there would not be excessively long times. Furthermore, all the programs have names of files hard-coded. Personally, I would have made it a bit more global so that names would not have to be changed across numerous files. I was unsure if this would go against certain project parameters however.