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IFT 365 – Applied Programming Language for Information Technology

Coding Project – Final Submission

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Date: 12/6/2024

Instructions: Congratulations! You have finished the coding project! Use the questions below to have a written discussion about your experience completing the coding project.

Before submitting this assignment, make sure you have met all these requirements:

- You have completed this worksheet
- You have at least six (6) features or functions in your program

1. Now that you are finished with your project, the program might be quite different than what you originally planned. Discuss in detail any changes you made to your original plans. If you did make changes, discuss why you made these changes.\

My project is a lot different than I originally had intended. Some of the packages I initially wanted to use, didn't work for my use case. Additionally, some of the features I could not integrate. I wanted to generate daily reports, and I was not able to do that as I encountered a lot of issues with some of the other features. However, the core functionality of the project is there, and I am really thrilled with how it turned out.

2. Discuss in detail why you chose the features you did. Are you happy with the outcome? Did you run into any issues with your features while developing your program? What did you do to overcome those issues? Would you do anything differently the next time you designed a program?

I am extremely happy with the outcome of my project. A few key features I am really proud of are; the terminal based GUI (which has real time monitoring), html graphic for a historical overview of network monitoring speeds, and lastly the features for writing and appending the csv file. One feature that took time, but enhances the program, is that it can parse the csv file for the oldest entry and overwrite it. This is useful for if you get out of order in the csv file.

3. You likely encountered challenges while working on your coding project. Discuss in detail the challenges you encountered and what you did to overcome them.

The biggest challenge for me was trying to find ways to dynamically call the executable for running the speed test. I did not want to have the path hard coded, because the tool is intended to be shared. If it's hardcoded then the user needs to be able to update the path. Second, the biggest issue was writing and appending the csv file. Since we have headers, I needed to find a way to make sure it did not append the header. Lastly, interacting with the different packages used to create this tool. For example, the terminal-based GUI was really time consuming because I needed to map the GUI in the terminal using X/Y coordinates. So, it was a lot of trial and error finding the right layout.

4. Describe at least three (3) things you learned while working on your coding project that you found interesting and useful.

First and foremost, the biggest thing I learned was new packages in Go. I use Go a lot at work, so I am familiar with it and how to code with it. I wanted to challenge myself and build a tool that is applicable to what I've learned in this degree program. So learning new packages and researching them was really challenging. Second, was writing and appending to a csv file. At work I create programs to test things, I don't write to a csv file. That was new, and challenging to find the right way to do it. Adding and fixing features to help facilitate this was challenging but enjoyable. The last thing I learned was using Go for HTML. This was completely new to me, but really fun to learn.

5. Is there anything you would have liked to incorporate into your coding project that wasn't covered during this course? Is there anything you wish we would have spent more time on during this course?

Overall, I enjoyed this course the most out of all the programming courses I have taken. The only point of feedback I would have is, more coding projects and less quizzes. I'm a hands-on learner, so reading the book was useful – but applying it through projects is how I learn the best.

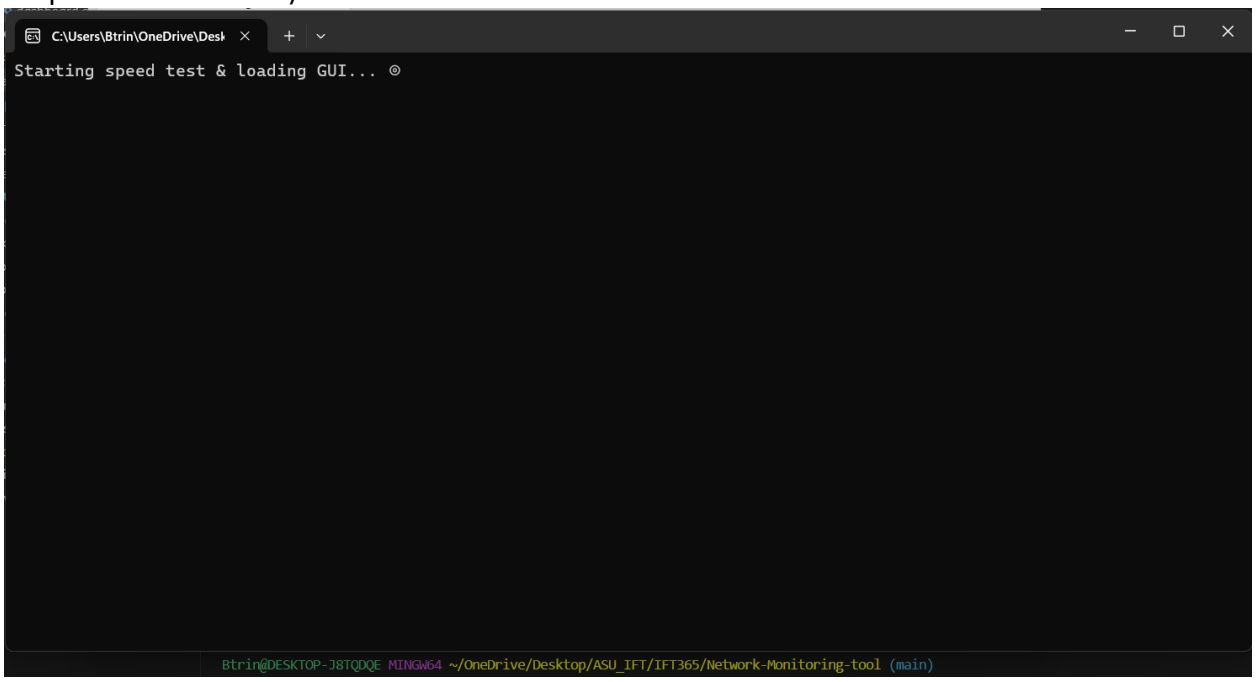
6. While trying to be as objective and unbiased as possible, please go through and critique your coding project using the attached rubric. In the “Student Critique” column, indicate which score you should receive for each category and write a short (one or two sentences maximum) justifying that score.

Student Critique

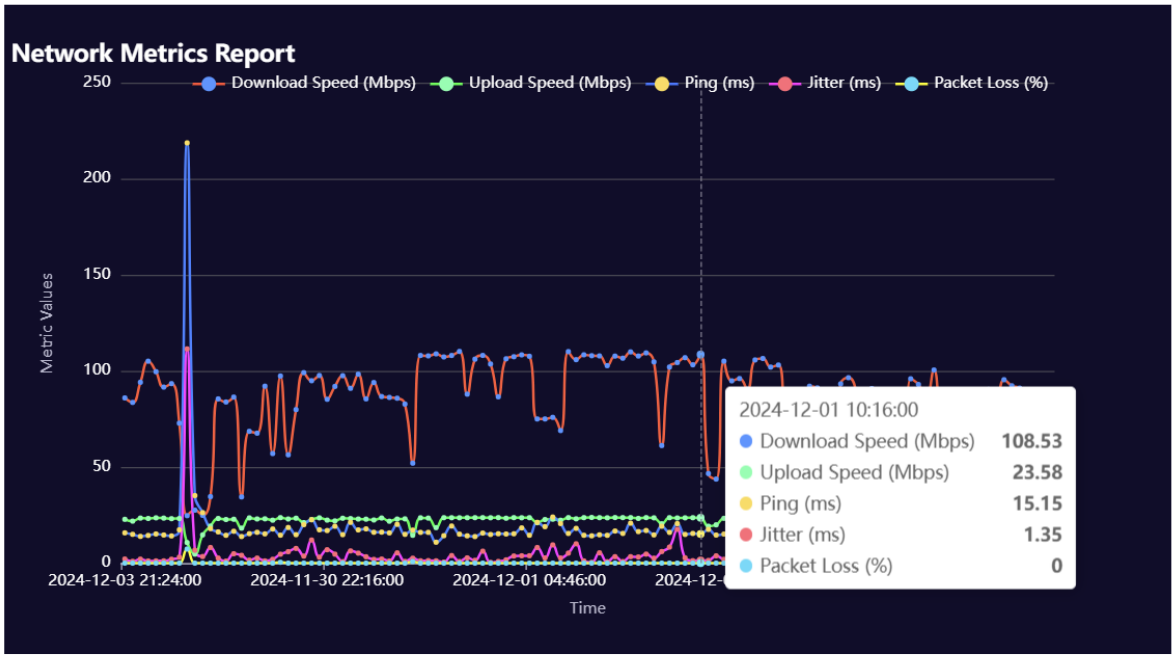
	Outstanding	Average	Needs Improvement	Student Critique
Example	You did everything correctly.	You did some things correctly.	You did nothing correctly.	Outstanding – I believe I did everything correctly because of x, y and z.
Discussion Questions: Answers	Clearly and completely answered the questions.	Answers to questions could have been more complete or more clear.	Answers were very short or missing.	Outstanding – I participated in every discussion post and replied to other students.
Discussion Questions: Mechanics	Organized, neat in appearance, easy to read and understand.	Somewhat organized and neat in appearance; the document is mostly easy to read and understand.	Answers were very short or missing.	Outstanding – all of my discussion posts exceeded the word count outlined in the syllabus.
Functionality	All required features/functions are fully implemented and work as intended without errors or bugs.	Most features/functions are implemented and work correctly, with minor errors or missing functionality.	Few or no features/functions work as intended; major issues prevent the program from functioning properly.	Average – I was not able to incorporate all the functions. One major bug is the csv file being opened while trying to write to it.
Code Structure and Organization	Code is well-organized with modular design, clear separation of concerns, and no unnecessary repetition.	Code is somewhat organized but may include redundant logic, poor modularity, or inconsistent structure.	Code is poorly organized, difficult to follow, and lacks modular design, making it hard to understand or extend.	Outstanding – I made sure to take a lot of notes in the code so it outlines what it does.
Error Handling and Input Validation	The program anticipates and handles all user and runtime errors gracefully, providing clear error messages and handling invalid input effectively.	Some errors are handled, but the program may crash or behave unpredictably under specific conditions.	Minimal or no error handling; program frequently crashes or fails with invalid input.	Outstanding – I have a ton of log messages and report them to a log file so that it does not get spammy.
Adherence to GO Language Conventions	Code adheres to GO best practices, including proper naming conventions, idiomatic constructs, and efficient use of GO's standard library.	Some adherence to Go conventions, but there are notable deviations or inefficient practices.	Code shows minimal understanding of Go conventions, with significant issues in style or inappropriate use of language features.	Outstanding – My code is very well organized and structured.
User Interaction and Usability	The program provides an intuitive and user-friendly interface with clear prompts, instructions, and helpful feedback.	The program is functional but may have some usability issues, such as unclear prompts or limited feedback.	The program is confusing or difficult to use, with poor instructions or no meaningful feedback for the user.	Outstanding – its autonomous so the user just needs to run the application.
Efficiency and Performance	The program runs efficiently, with minimal resource usage and no unnecessary computations or delays.	The program runs adequately but may include inefficient algorithms or unnecessary resource usage.	The program runs slowly, uses excessive resources, or has poorly optimized algorithms that impact performance.	Outstanding – does not take a lot of CPU usage to run the program, or keep it running.
Originality and Creativity	The program demonstrates exceptional creativity, with unique or innovative features that go beyond basic requirements.	The program is functional but lacks significant creativity or innovation, implementing only basic or expected solutions.	The program shows little to no originality, with minimal effort to go beyond the bare minimum requirements.	Outstanding – You had wanted some user input, but I felt that an autonomous program that executes a task with minimal user input was a better user experience.
Use of Data Structures	Data structures are chosen thoughtfully and used effectively, demonstrating a deep	Some appropriate data structures are used, but their implementation may not be optimal or fully leveraged.	Minimal or inappropriate use of data structures, demonstrating a lack of understanding or misuse.	Outstanding – I think I did a great job using structures and functions to run the program.

	understanding of their purpose and application.			

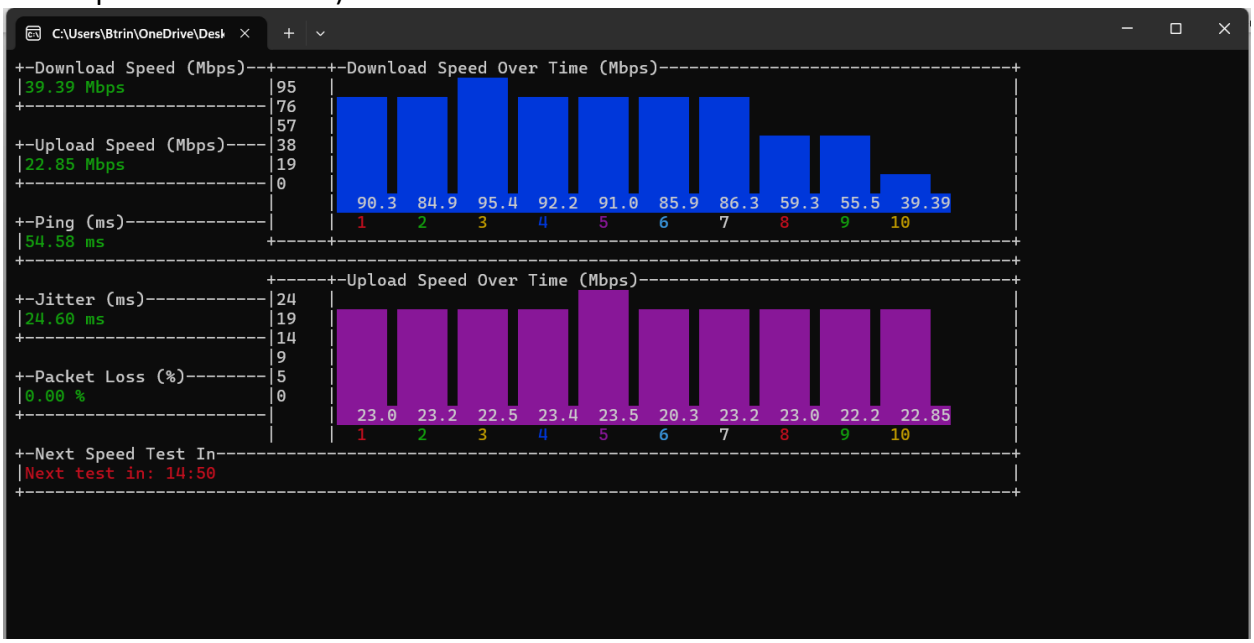
7. Insert the screenshot of feature #1 here. (The screenshot should show the prompt and output of the feature.)



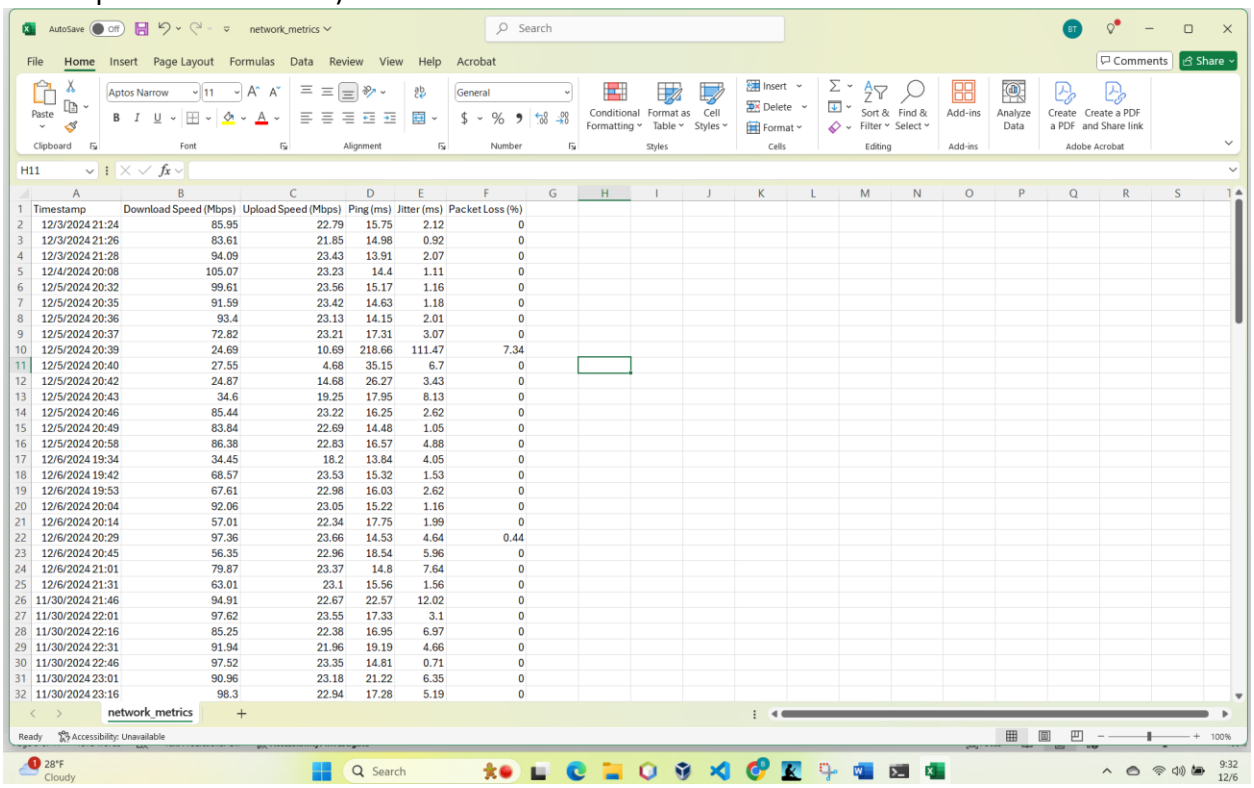
8. Insert the screenshot of feature #2 here. (The screenshot should show the prompt and output of the feature.)



9. Insert the screenshot of feature #3 here. (The screenshot should show the prompt and output of the feature.)

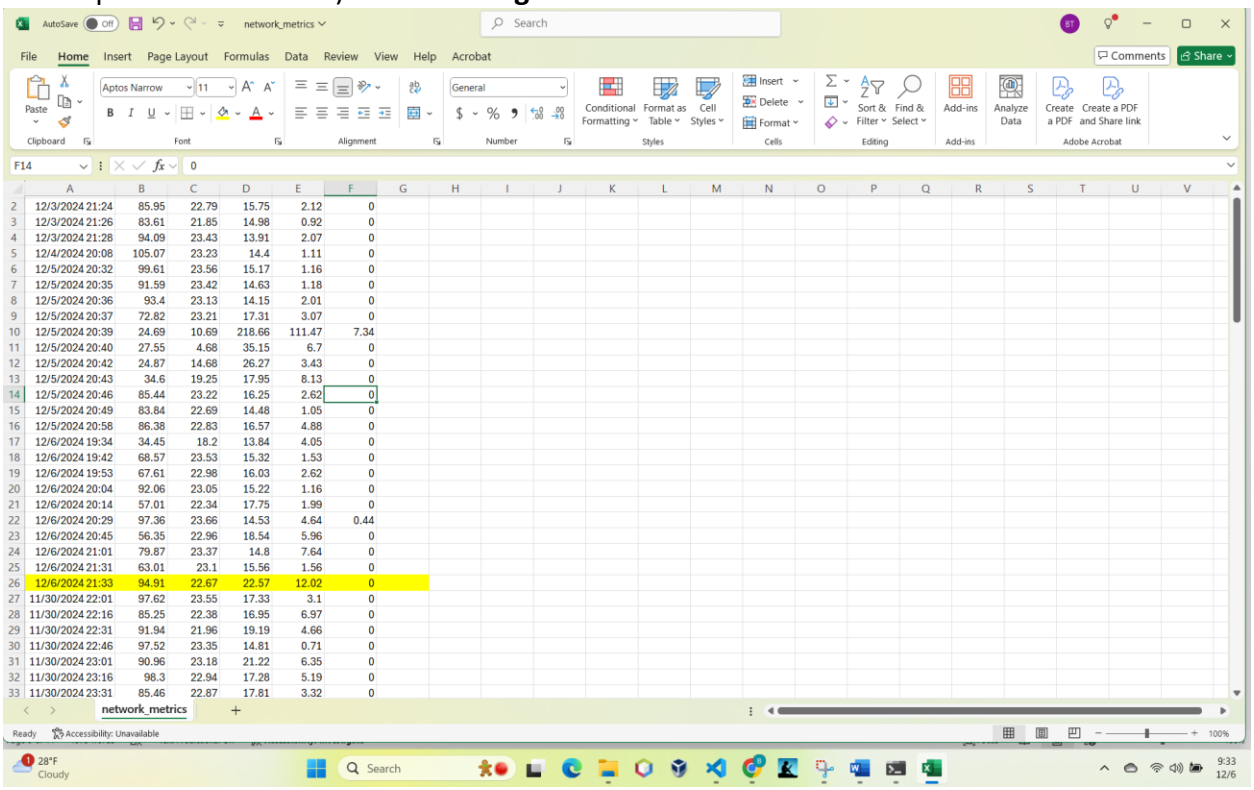


10. Insert the screenshot of feature #4 here. (The screenshot should show the prompt and output of the feature.)



	Timestamp	Download Speed (Mbps)	Upload Speed (Mbps)	Ping (ms)	Jitter (ms)	Packet Loss (%)
2	12/3/2024 21:24	85.95	22.79	15.75	2.12	0
3	12/3/2024 21:26	83.61	21.85	14.98	0.92	0
4	12/3/2024 21:28	94.09	23.43	13.91	2.07	0
5	12/4/2024 20:08	105.07	23.23	14.4	1.11	0
6	12/5/2024 20:32	99.61	23.56	15.17	1.16	0
7	12/5/2024 20:35	91.59	23.42	14.63	1.18	0
8	12/5/2024 20:36	93.4	23.13	14.15	2.01	0
9	12/5/2024 20:37	72.82	23.21	17.31	3.07	0
10	12/5/2024 20:39	24.69	10.69	218.66	111.47	7.34
11	12/5/2024 20:40	27.55	4.68	35.15	6.7	0
12	12/5/2024 20:42	24.87	14.68	26.27	3.43	0
13	12/5/2024 20:43	34.6	19.25	17.95	8.13	0
14	12/5/2024 20:46	85.44	23.22	16.25	2.62	0
15	12/5/2024 20:49	83.84	22.69	14.48	1.05	0
16	12/5/2024 20:58	86.38	22.83	16.57	4.88	0
17	12/6/2024 19:34	34.45	18.2	13.84	4.05	0
18	12/6/2024 19:42	68.57	23.53	15.32	1.53	0
19	12/6/2024 19:53	67.61	22.98	16.03	2.62	0
20	12/6/2024 20:04	92.06	23.05	15.22	1.16	0
21	12/6/2024 20:14	57.01	22.34	17.75	1.99	0
22	12/6/2024 20:29	97.36	23.66	14.53	4.64	0.44
23	12/6/2024 20:45	56.35	22.96	18.54	5.96	0
24	12/6/2024 21:01	79.87	23.37	14.8	7.64	0
25	12/6/2024 21:31	63.01	23.1	15.56	1.56	0
26	11/30/2024 21:46	94.91	22.67	22.57	12.02	0
27	11/30/2024 22:01	97.62	23.55	17.33	3.1	0
28	11/30/2024 22:16	85.25	22.38	16.95	6.97	0
29	11/30/2024 22:31	91.94	21.96	19.19	4.66	0
30	11/30/2024 22:46	97.52	23.35	14.81	0.71	0
31	11/30/2024 23:01	90.96	23.18	21.22	6.35	0
32	11/30/2024 23:16	98.3	22.94	17.28	5.19	0

11. Insert the screenshot of feature #5 here. (The screenshot should show the prompt and output of the feature.) **Overwritting**



	A	B	C	D	E	F
2	12/3/2024 21:24	85.95	22.79	15.75	2.12	0
3	12/3/2024 21:26	83.61	21.85	14.98	0.92	0
4	12/3/2024 21:28	94.09	23.43	13.91	2.07	0
5	12/4/2024 20:08	105.07	23.23	14.4	1.11	0
6	12/5/2024 20:32	99.61	23.56	15.17	1.16	0
7	12/5/2024 20:35	91.59	23.42	14.63	1.18	0
8	12/5/2024 20:36	93.4	23.13	14.15	2.01	0
9	12/5/2024 20:37	72.82	23.21	17.31	3.07	0
10	12/5/2024 20:39	24.69	10.69	218.66	111.47	7.34
11	12/5/2024 20:40	27.55	4.68	35.15	6.7	0
12	12/5/2024 20:42	24.87	14.68	26.27	3.43	0
13	12/5/2024 20:43	34.6	19.25	17.95	8.13	0
14	12/5/2024 20:46	85.44	23.22	16.25	2.62	0
15	12/5/2024 20:49	83.84	22.69	14.48	1.05	0
16	12/5/2024 20:58	86.38	22.83	16.57	4.88	0
17	12/6/2024 19:34	34.45	18.2	13.84	4.05	0
18	12/6/2024 19:42	68.57	23.53	15.32	1.53	0
19	12/6/2024 19:53	67.61	22.98	16.03	2.62	0
20	12/6/2024 20:04	92.06	23.05	15.22	1.16	0
21	12/6/2024 20:14	57.01	22.34	17.75	1.99	0
22	12/6/2024 20:29	97.36	23.66	14.53	4.64	0.44
23	12/6/2024 20:45	56.35	22.96	18.54	5.96	0
24	12/6/2024 21:01	79.87	23.37	14.8	7.64	0
25	12/6/2024 21:31	63.01	23.1	15.56	1.56	0
26	12/6/2024 21:33	94.91	22.67	22.57	12.02	0
27	11/30/2024 22:01	97.62	23.55	17.33	3.1	0
28	11/30/2024 22:16	85.25	22.38	16.95	6.97	0
29	11/30/2024 22:31	91.94	21.96	19.19	4.66	0
30	11/30/2024 22:46	97.52	23.35	14.81	0.71	0
31	11/30/2024 23:01	90.96	23.18	21.22	6.35	0
32	11/30/2024 23:16	98.3	22.94	17.28	5.19	0
33	11/30/2024 23:31	85.46	22.87	17.81	3.32	0

12. Insert the screenshot of feature #6 here. (The screenshot should show the prompt and output of the feature.)