Chenkun Zhao

Alfredo Iván López Sherman

DGM6108 Prog foundations for DigMedia

10 Dec 2025

Final Report

https://david122616.github.io/dgm6109/term/Final

Raw Data:

As sleep hours [increase], daily mood [increases].
As drink energy drink [increases], daily mood [decreases].

Date 2025	Falling asleep time	Wake up time	Sleep hours（hrs）	Sleep Quality（1-10）	Energy Drinks (6 hrs before bedtime)	Morning Mood（1-5）	Afternoon Energy（1-5）	Evening Energy（1-5）	Notes
Sep 25	11:00pm-11:15pm	10:30 am	11 hrs	10	0	5	4	2	I have classes at night so feel tired
Oct 4	1:00 AM	10:15 AM	9 hrs	7	1	4	5	5	Girlfriend's birthday, go on a date
Oct 5	12：00 AM	10：00 AM	10 hrs	10	1	4	3	4	Doing homework drinking energy drinks at night
Oct 8	11:00 PM	10:00 AM	11 hrs	9	3	4	5	5	Go to the gym
Oct 10	10:00 PM	8:30 AM	10 hrs	5	0	2	3	2	I slept in a bad position and got a stiff neck
Oct 11	2:00 AM	8:00 AM	6 hrs	3	1	2	2	2	My neck hasn’t recovered yet.
Oct 13	11:00 PM	9:00 AM	10 hrs	9	0	4	3	3	
Oct 15	12:00 AM	10:00 AM	10 hrs	9	2	5	4	4	Go to the gym
Oct 16	11:00 PM	9:00 AM	10 hrs	10	0	5	5	3	

Oct 18	1:00-2:00 AM	12:00 PM	12 hrs	5	1	2	3	3	Go to the party and drunk
Oct 20	11:00 PM	10:00 AM	10 hrs	9	0	4	3	3	
Oct 22	10:00 PM	10:00 AM	10 hrs	5	1	3	2	3	Woke up at 2:00 AM and fell asleep again at 3:00 AM; felt anxious about homework grades.
Oct 23	1:00 AM	7:00 AM	7 hrs	5	2	2	2	2	Drinking too many energy drinks without exercising
Oct 24	12:00 AM	12:00 PM	12 hrs	10	0	5	5	5	
Oct 26	2:00 AM	11:00 AM	9 hrs	6	2	3	3	3	
Oct 27	2:00 AM	10:00 AM	9 hrs	5	1	4	3	2	
Oct 28	11:00 PM	7:00 AM	8 hrs	8	0	5	4	4	
Oct 29	11:00 PM	11:00 AM	12 hrs	9	0	5	5	5	
Nov 2	2:00 AM	9:00 AM	7 hrs	4	3	3	2	2	
Nov 12	1:00 AM	8:00 Am	7 hrs	3	3	2	2	2	
Nov 13	2:00 AM	11:00 PM	9 hrs	6	2	2	1	1	
Nov 14	11:00 PM	10:00 AM	9 hrs	9	0	5	4	4	
Nov 17	1:00 AM	7:00 AM	6 hrs	2	3	2	1	1	
Nov 18	10:00 PM	10:00 AM	12 hrs	10	0	5	5	5	
Nov 20	4:00 AM	12:00 PM	8 hrs	1	3	1	1	1	
Nov 24	9:00	8:00	11 hrs	9	0	5	4	4	

	PM	AM							
Nov 25	1:00 AM	12:00 PM	12 hrs	6	1	3	3	2	
Nov 28	2:00 AM	10:00 AM	8 hrs	4	2	2	1	1	
Nov 29	11:00 PM	9:00 AM	10 hrs	9	0	5	4	4	
Nov 30	1:00 AM	8:00 AM	8 hrs	4	1	2	2	2	
Dec 1	10:00 PM	10:00 AM	12 hrs	10	0	5	5	5	
Dec 2	9:00 PM	8:00 AM	11 hrs	9	0	5	4	4	

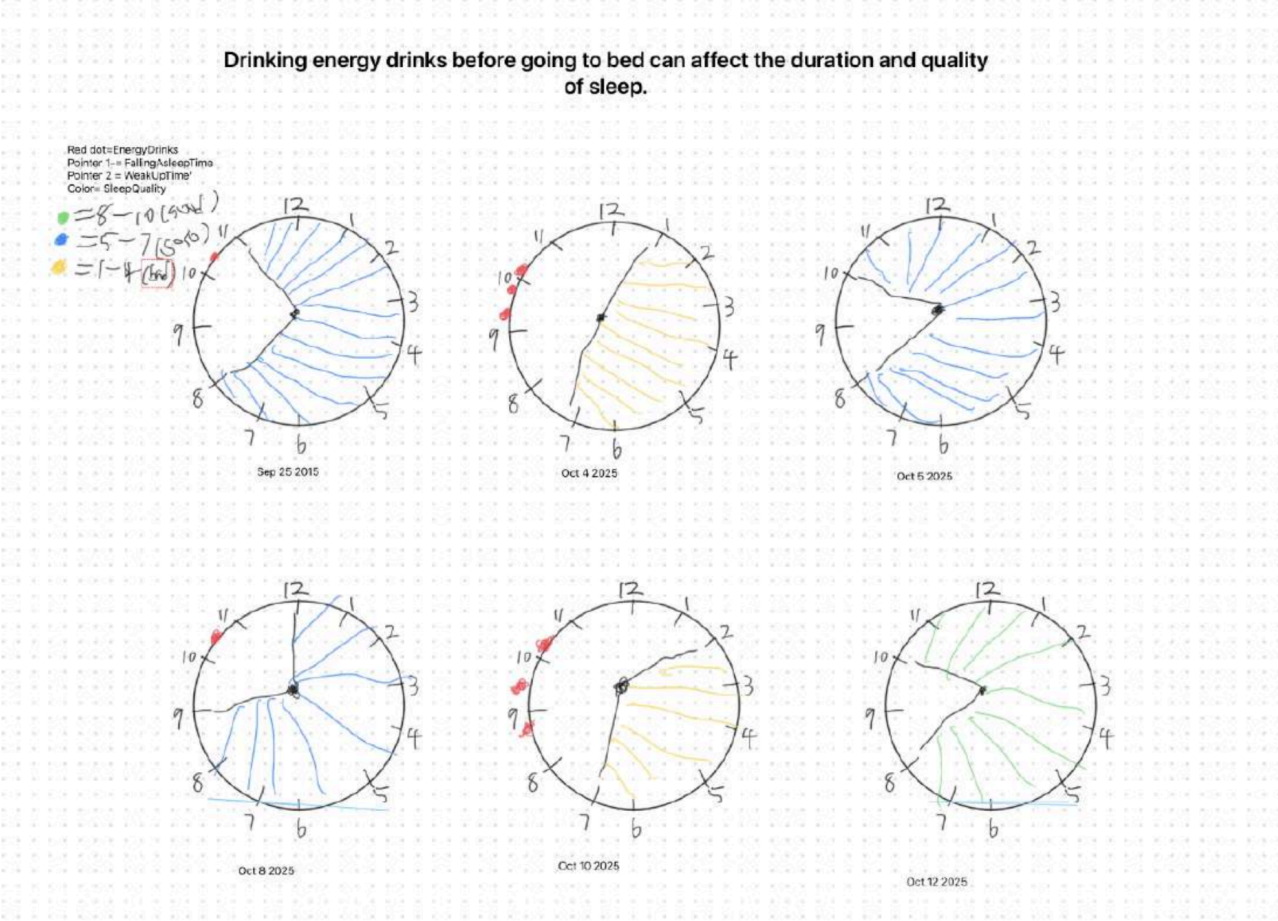
Data Collection Rationale:

For this project, I recorded my sleep-related data every day throughout the term. My sleep duration and sleep quality were measured using my Apple Watch, which automatically tracks the length of my sleep and evaluates sleep quality based on motion, heart rate, and sleep stage patterns. I chose this method because it provides consistent and objective measurements, which are more reliable than estimating these values manually.

Other properties—such as morning mood, afternoon energy, and energy drink consumption—were recorded manually once per day at consistent times. I used simple rating scales (1–5 for mood and energy; 1–10 for sleep quality when needed) so that the data would remain easy to compare and visualize. These variables were selected because I wanted to understand how my sleep habits influence my daily emotional and physical state. Tracking them together allowed me to explore potential correlations, such as whether sleeping longer improves my mood or whether energy drinks affect my sleep quality.

Recording data daily gave me enough consistency to observe patterns over time, while using the Apple Watch ensured accuracy in the core sleep measurements that form the foundation of my visualization.

Alternative Sketch:



The sketch I decided not to use was a clock-based visualization, where each day was represented as an individual clock showing my sleep time and related data. This idea had several advantages. First, it was more creative and thematically appropriate, since the clock directly connects to the concept of tracking sleep. Second, it was very easy to read at a daily level because each clock displayed only one day of data with no overlap.

However, this design also had major drawbacks. Since one clock represents only one day, the visualization would become difficult to manage as the amount of data increases. With many clocks, it would be hard for viewers to find specific information or understand the overall trend. More importantly, this sketch makes it difficult to observe patterns across time. For example, in my final visualization, it is very clear that on days without energy drinks, my sleep quality often stays around five points. In the clock sketch, the data is separated into many individual objects, making it harder to identify relationships or compare values across days. For these reasons, I chose not to use this sketch for my final project.

Rationale for Your Final Visualization:

I chose a scatter plot because it allows me to clearly show the relationship between sleep and mood. The position of each point makes it easy to compare Sleep Hours and Mood across different days. I used circle size to represent Sleep Quality, since larger circles give the viewer an immediate sense of “better rest.” Color is an effective way to show Energy Drink consumption because it creates clear visual differences among categories. To make the visualization more readable, I sorted the data so that larger circles are drawn first, preventing smaller circles from being hidden behind them. I also created custom legends for circle size and color so that viewers can quickly understand the meaning of each visual element. Altogether, these choices make the scatter plot an efficient and intuitive format for exploring the patterns in my data.

Overall, this visualization format allows multiple aspects of my data to be displayed simultaneously in a simple, meaningful way. It reveals patterns that would be difficult to see in other formats, making the scatter plot the most effective choice for communicating the relationships in my dataset.

Self-Analysis:

My hypothesis was as sleep hours increase, daily mood increases. As drink energy drink increases, daily mood decreases. This project gave me the opportunity to observe my daily habits in a more structured and objective way. Before collecting the data, I had some assumptions about how my sleep might affect my emotions and energy, but I had never examined these patterns closely. By visualizing the data, I was able to step back and look at my routines from a more analytical perspective. Throughout the process, I learned not only about the relationship between sleep and mood, but also about how data collection, design choices, and visualization techniques influence the conclusions we draw. Reflecting on my decisions and results helped me better understand both my personal habits and my approach to problem-solving as a creator.

When I completed the final data, I think my data can confirm my hypothesis. I discovered a very influential one. It was energy drinks.I've found that drinking energy drinks six hours before bed has a significant impact on my sleep onset time and sleep duration, which in turn affects my morning mood and sleep quality. And sleep quality and morning mood, in turn, affect my productivity throughout the day.And another piece of data that I overlooked but is very important is that sometimes I wake up at night and then fall asleep again. This is not recorded in the data but has a significant impact on the quality of my sleep.So I realized morning mood is not only related to sleep hours but also strongly influenced by waking up during the night and energy drink consumption.And One limitation of my project is that my mood ratings are subjective and may vary depending on how I interpret the scale each day. In future work, I could define the scale more clearly or collect mood multiple times per day for better accuracy.

I also encountered some challenges and learned a lot about the code part.I want my chart to look clear, so I don’t want a lot of useless numbers. For example, on the x-axis, I never slept only one or two hours, so I used a for-loop to make the axis flexible. This way, the x-axis only shows the range that actually appears in my data. This makes the chart cleaner and easier to read.

In conclusion, this project also changed the way I think about my habits. I became more aware of the small choices in my daily routine, such as caffeine intake or bedtime consistency, and how much they influence my mood the next day. This visualization helped me better understand my own sleep behavior.The project also improved my coding and design skills.If I continue this project, I would like to collect more data,for example Sleeping environment levels or screen time before bed and waking up during the night time.

Works Cited

All code techniques and examples used in this project were learned directly from the instructor's lectures, lab exercises, and in-class demonstrations.

Alfredo Iván López Sherman. *DGM6108-07: Programming Foundations for Digital Media: Lecture Slides and Lab Materials.* Northeastern University, 2025.