1   Contents

2 Generating Stacked Columns Based on Months and Years

To begin with, I added two new columns called "MONTH" and "YEAR".

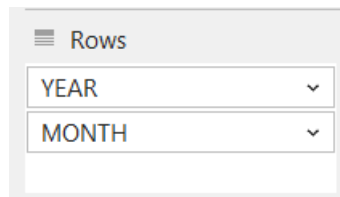These are the formulas to extract the months and years from date.

Next, I included the "YEAR" and "MONTH" columns in the "Rows" section of the PivotTable field list.

Sum of DURATION	Column Labels							
Row Labels	CS50	DATA SCIENCE	ECONOMY	MACHINE LEARNING	OTHER	READING	STATISTICS	Grand Total
2021		00005:45	00000:27	00130:35	00017:24	00017:49		00172:00
September		00003:16		00002:58	00000:50	00002:27		00009:31
October		00001:46	00000:27	00031:14	00009:48	00011:34		00054:49
November		00000:43		00050:10	00003:53	00001:13		00055:59
December				00046:13	00002:53	00002:35		00051:41
2022	00017:02	00354:48	00001:23	00074:56	00027:26	00010:01	00063:07	00548:43
January			00000:35	00054:03	00001:15	00000:53		00056:46
February		00004:37		00018:25				00023:02
March		00051:57	00000:48	00002:28				00055:13
April		00050:29			00005:06	00000:36		00056:11
May		00028:13			00001:39	00000:47		00030:39
June		00046:39			00009:43	00001:20		00057:42
July	00001:38	00037:17			00001:05	00001:53		00041:53
August	00002:31	00017:51			00003:23	00001:13	00016:50	00041:48
September	00012:53	00015:32			00000:25	00000:30	00027:56	00057:16
October		00038:06			00000:15	00000:49	00005:49	00044:59
November		00038:49			00003:20	00001:20		00043:29
December		00025:18			00001:15	00000:40	00012:32	00039:45
2023		00165:15	00007:53		00002:59	00005:04	00001:25	00182:36
January		00043:17	00001:54		00000:40	00001:55	00001:25	00049:11
February		00034:11	00005:59		00000:21	00001:37		00042:08
March		00036:36				00001:10		00037:46
April		00023:15				00000:22		00023:37
May		00027:56			00001:58			00029:54
Grand Total	00017:02	00525:48	00009:43	00205:31	00047:49	00032:54	00064:32	00903:19

Furthermore, I selected the desired courses from the "Column Labels" section.

Next, I navigated to the "PivotTable Analyze" tab in Excel, selected "PivotChart," and opted for the "Stacked Column" chart type.
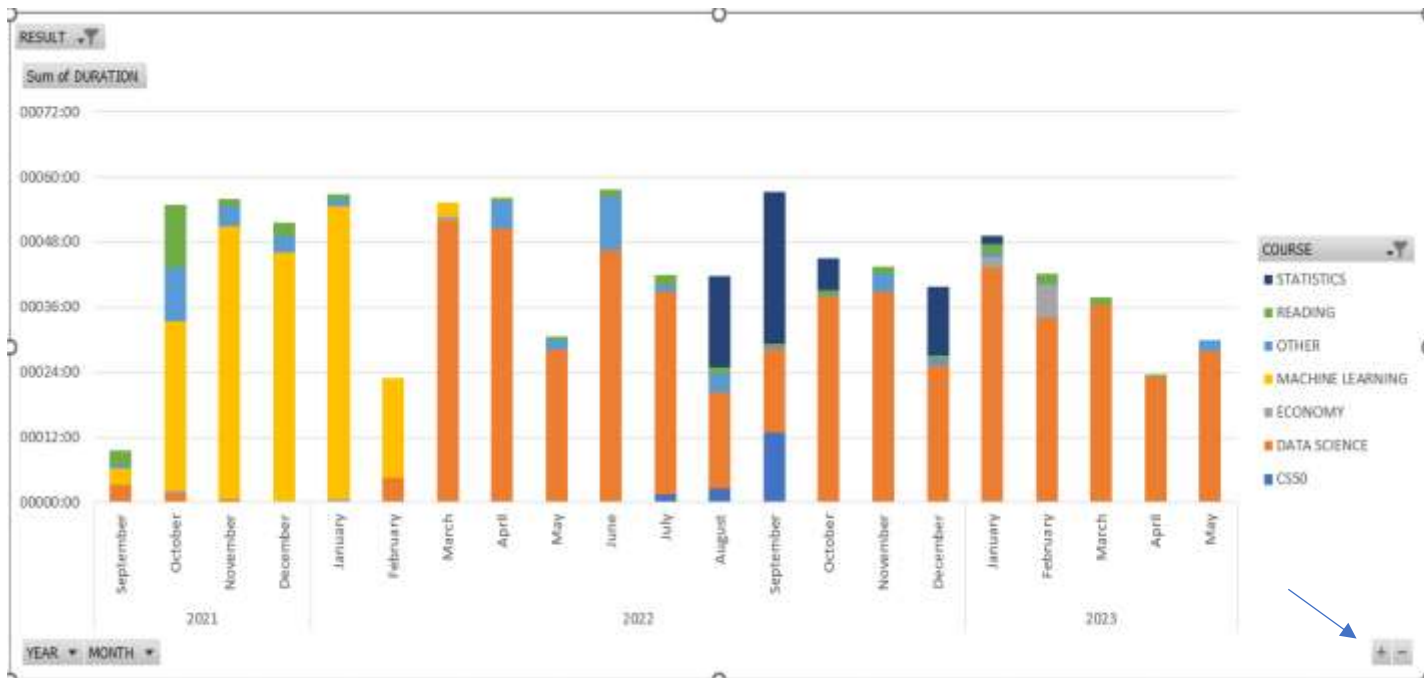
And this chart was created:

Figure 1 A stacked column chart distributed by years and months and filtered by subjects.

Upon clicking the "+" symbol on the chart, it expands and displays additional details as shown below:
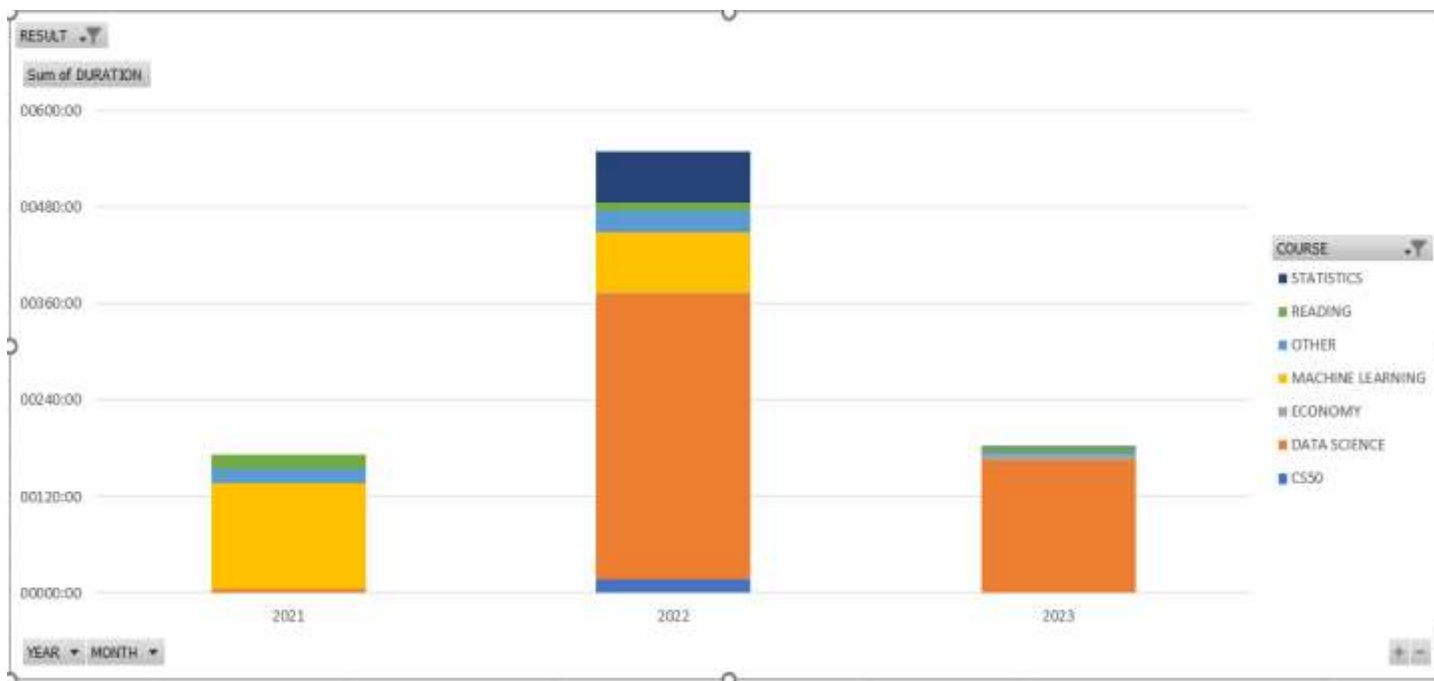

Figure 2

2.1 Interpretation of Figure 1 and Figure 2

Due to the study record starting in late October 2021, the study time in October appears relatively low. Between October 2021 and the end of January 2022, a study time of approximately 55 to 60 hours is observed, predominantly focused on machine learning. Additionally, October 2021 stands out as the month with the highest amount of reading books or articles.

In February 2022, it is evident that the individual didn't study much but began exploring Data Science to some extent. By March 2022, they significantly shifted their focus from machine learning to Data Science. Until August, they predominantly studied Data Science and demonstrated a generally consistent performance, except for May.

During August to October 2022, a balanced approach between Data Science and Statistics is noticeable.

In the last three months of 2022, there is a declining trend in performance. Although there is some recovery in January 2023, they couldn't fully regain their previous performance and experienced a declining trend until May, considering that only two-thirds of May were recorded. Although not significant, there might be some improvement in performance.

A significant declining trend is evident in 2023. The individual should analyze their performance in June and October 2022 to understand why they couldn't replicate it in the first half of 2023. Overall, for them to maintain their 2022 performance, they should strive for notable improvement in the second half of 2023.

3 Analysis of Data Science Total Study Hours by Years and Months

In order to generate multiple charts from a pivot table, I follow a process of duplicating the pivot table and adjusting it to fit each specific chart. Essentially, I create a separate pivot table for each chart I want to create. As a result, the data displayed in the charts differs according to the characteristics of the corresponding pivot table. This is the reason behind duplicating the pivot table for each individual chart.
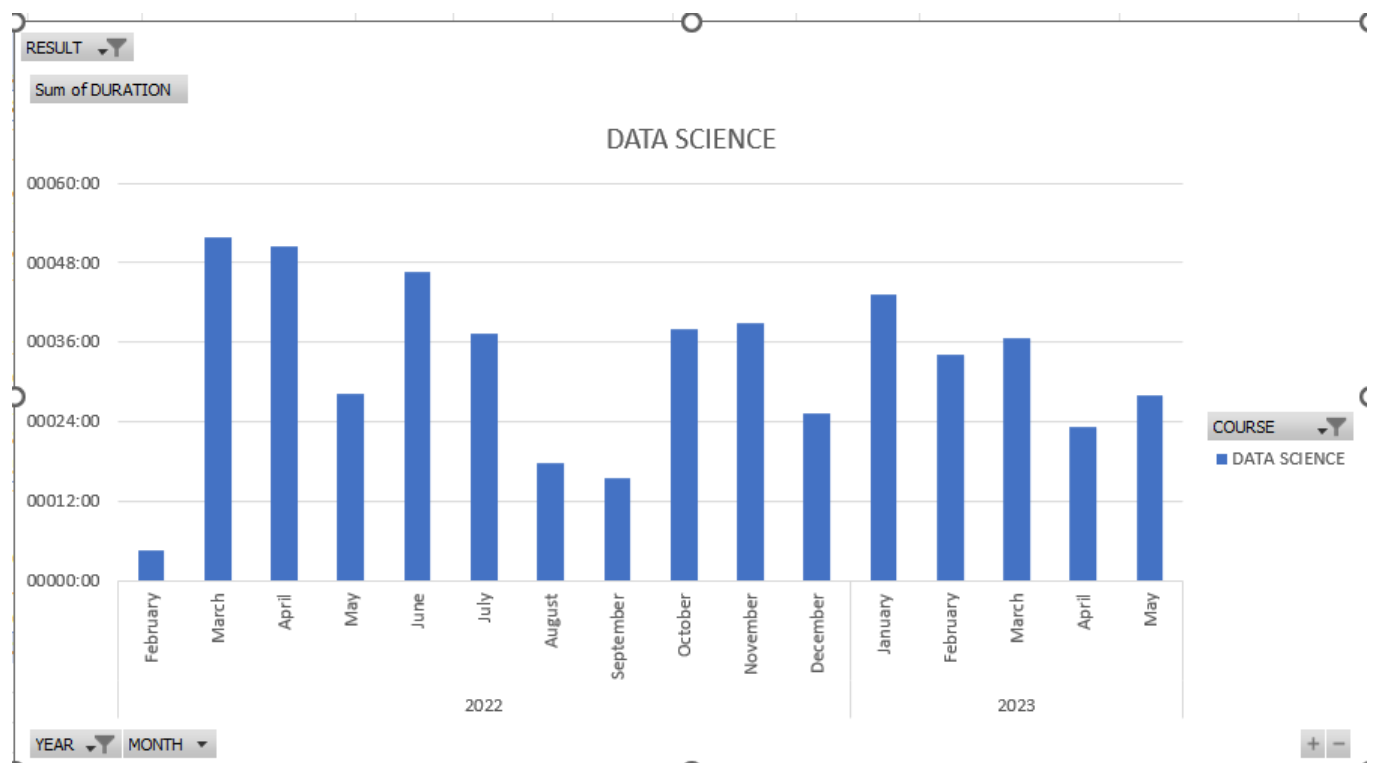

Considering that there has been a predominant focus on Data Science for approximately the past one and a half years, it seems appropriate to analyze the study performance related to Data Science.

It is observed that the highest amount of Data Science study was conducted in March and April 2022. In contrast, lower study hours were recorded in August and October 2022. October and November 2022 demonstrated an average study performance, while a significant decline was observed in December. In January 2023, there was an improvement in performance. Although there was a slight downward trend in February and March, it can be said that the individual maintained their performance. However, a significant decline was observed again in April 2023. In May 2023, as previously mentioned, assuming that only two-thirds of the month were recorded, it is likely that the performance would be similar to that of February and March 2023.

4 Analysis of the Most Active Hours of Work

Count of COURSE	Column Labels	
Row Labels	DATA SCIENCE	Grand Total
⊟1/1/1900 1:25	1	1
Mon, 16/01/2023	1	1
⊟1/1/1900 1:52	1	1
Thu, 05/01/2023	1	1
⊞1/1/1900 1:55	1	1
Grand Total	3.00	3.00

There were times written in incorrect format as shown in the figure. I corrected the rows below the "STARTING TIME" and "ENDING TIME" columns to the hh:mm format.
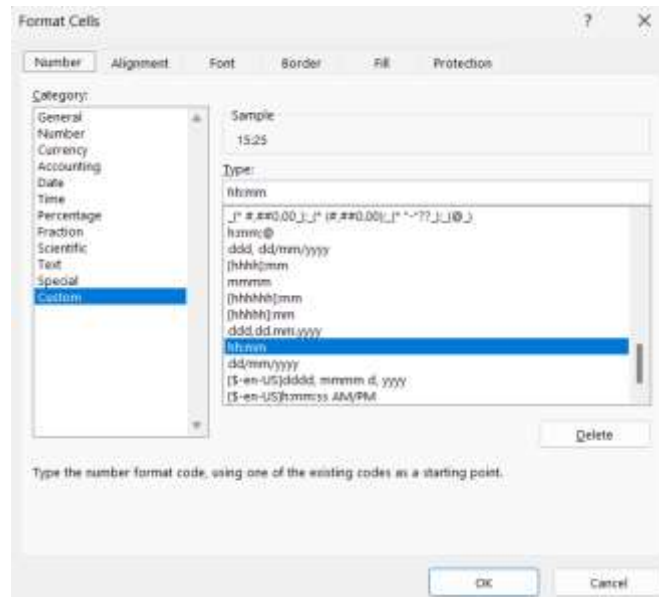
Then, I created a new PivotTable. I placed the "STARTING TIME" column in the Rows section and "Count of DATE" in the Values section. Afterwards, I sorted the "Count of Date" values in descending order and identified the most frequently worked hour, which, as seen in the figure, turned out to be 4 o'clock.

Row Labels ⌄↓	Count of DATE
(blank)	26
16:00	17
15:00	16
15:30	15
15:45	14
16:30	13
19:00	12
16:40	12
16:15	12

Next, I clicked on the "PivotTable Analyze" tab, and from there I selected the "Group Field" option. Then, I performed the necessary operations as shown in the image.

Then, I sorted the values again in descending order based on "Count of DATE". I grouped "STARTING TIME" values into one-hour intervals as shown in the image, and plotted the graph accordingly.

Row Labels	Count of DATE
4 PM	205
3 PM	199
5 PM	159
6 PM	150
2 PM	149
7 PM	117
1 PM	83
10 PM	75
9 PM	70
8 PM	69
12 PM	64
11 PM	61
12 AM	52
11 AM	44
1 AM	31
10 AM	19
2 AM	11
9 AM	8
3 AM	3
8 AM	1
Grand Total	1570
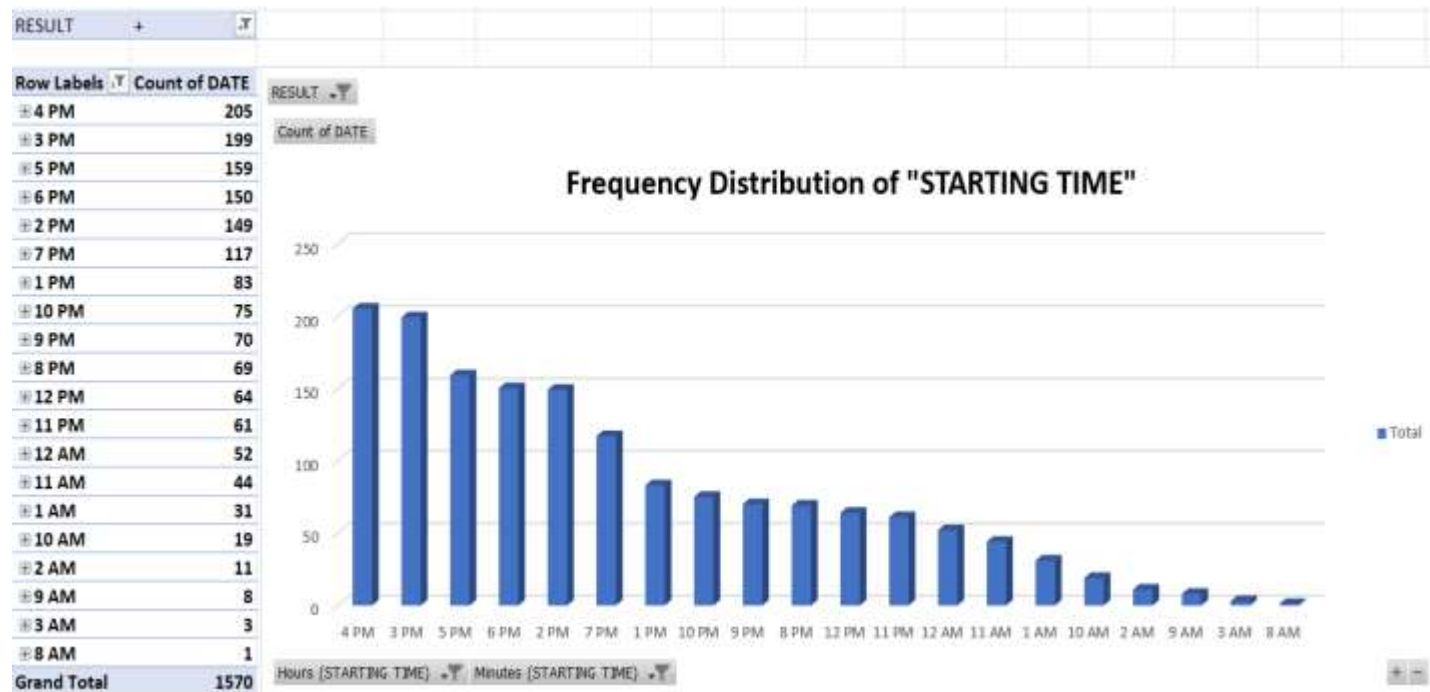
The time interval during which the person using SmartPomodoroPlanner studies the most is between 4 PM and 5 PM. The second most active study period is

between 3 PM and 4 PM. Looking at the first five values on the graph, it is evident that this person mostly studies between 2 PM and 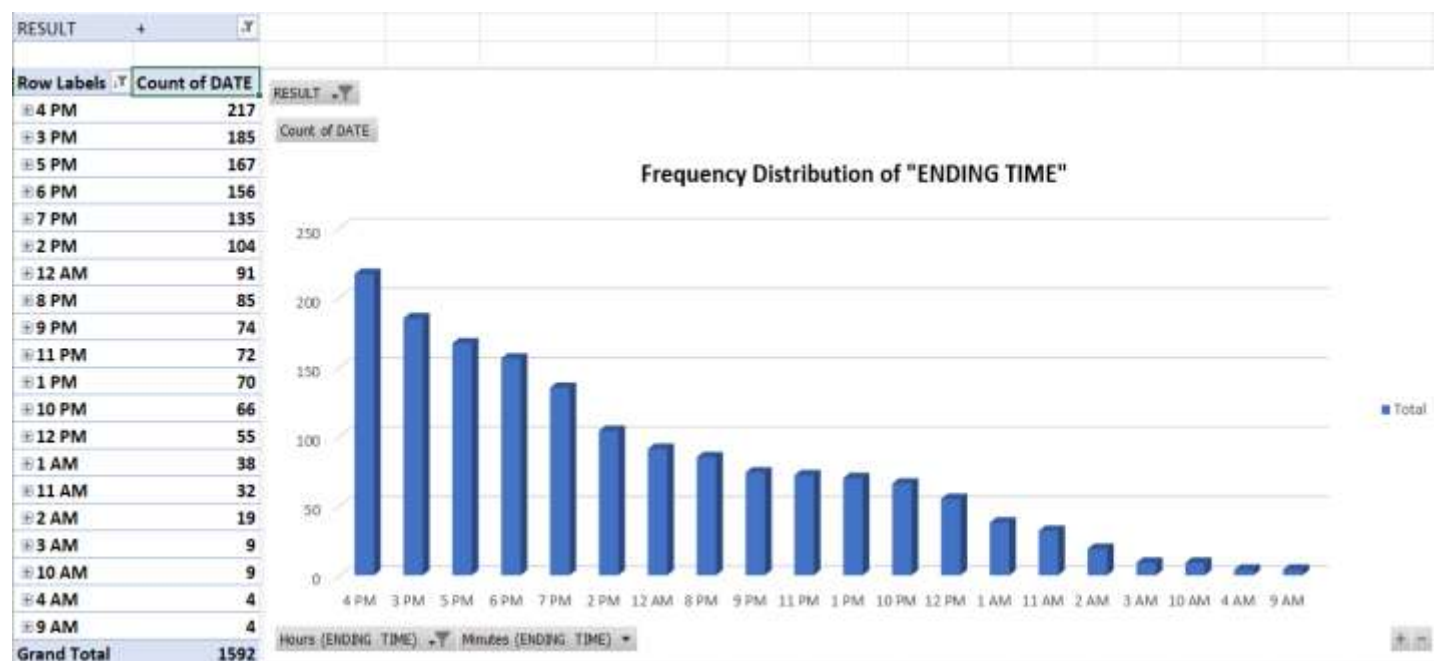8 PM. Additionally, we can infer from the graph that this individual prefers studying at night rather than in the morning.

The person has left the "STARTING TIME" column blank in 26 rows. In these empty cells, instead of filling in the hours, the person chose to manually fill in the "DURATION" column. Only a small portion, approximately 1.5% of the total data, is missing or left unfilled.

Now, let's examine the "ENDING TIME" column to see if we obtain similar results.

Row Labels	Count of DATE
4 PM	217
3 PM	185
5 PM	167
6 PM	156
7 PM	135
2 PM	104
12 AM	91
8 PM	85
9 PM	74
11 PM	72
1 PM	70
10 PM	66
12 PM	55
1 AM	38
11 AM	32
2 AM	19
3 AM	9
10 AM	9
4 AM	4
9 AM	4
Grand Total	1592

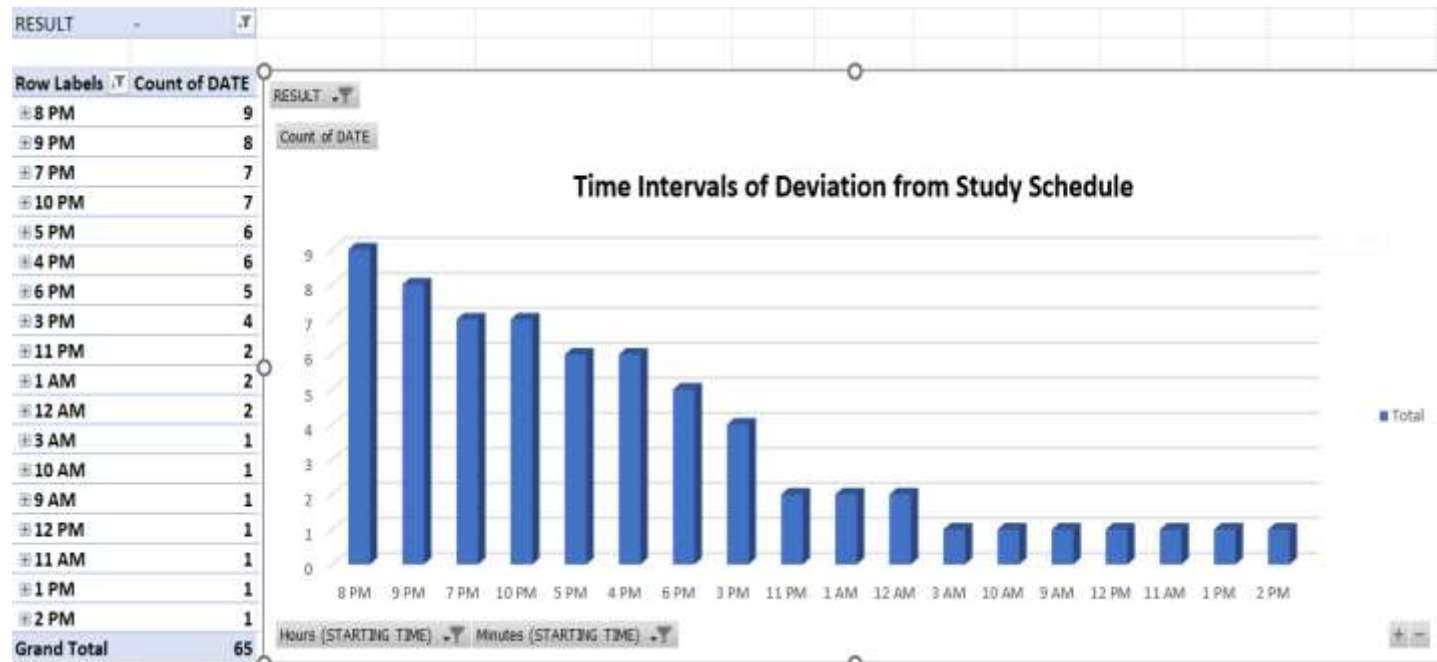The distribution of values in the "ENDING TIME" column aligns with the values in the "STARTING TIME" column. Therefore, the previous conclusions remain valid.

5 Data Analysis for Improving Future Performance

5.1 Hour Intervals of Non-Adherence to Study Schedule

The main objective is to identify and visualize the hour intervals during which the person generally deviates from their study schedule using a PivotTable. This aims

to raise awareness and help the individual understand their patterns of non-adherence to the study plan.

RESULT	

Row Labels	Count of DATE
8 PM	9
9 PM	8
7 PM	7
10 PM	7
5 PM	6
4 PM	6
6 PM	5
3 PM	4
11 PM	2
1 AM	2
12 AM	2
3 AM	1
10 AM	1
9 AM	1
12 PM	1
11 AM	1
1 PM	1
2 PM	1
Grand Total	65

Out of a total of 1661 rows, only 65 of them are marked as incomplete. This indicates that only about 4% of the entries deviate from the planned schedule. It shows that the person mostly adheres to the created study plan.

We can see from the image that the hours with the highest deviation from the plan are between 8 PM and 11 PM. Despite the fact that the hours between 4 PM and 6 PM are the most frequently planned study hours, we should pay attention to the lack of adherence between 8 PM and 11 PM. It is important to determine why the person tends to deviate from the study plan during these hours and optimize their adherence to the study schedule during this time frame.

5.2 Identifying Time Periods of High Study Performance to Aid in Improving Performance in the Future

The objective is to determine the day or days when the person achieves the highest study productivity and identify the corresponding time period. By reflecting on the

individual's motivation, daily routine, and other influencing factors during that timeframe, we can provide assistance in enhancing their study performance considerably in the future.

COURSE	(Multiple Items)	
RESULT	+	
Row Labels	**Sum of DURATION**	
Tue, 13/09/2022	0009:18	
Wed, 17/11/2021	0008:41	
Tue, 18/01/2022	0007:18	
Thu, 09/12/2021	0007:04	
Wed, 27/10/2021	0006:46	

The data in the image shows the maximum number of hours the person studied in a single day. The person's study record is 9 hours and 18 minutes, which occurred on September 13, 2022.

Now, let's examine the individual dates with the highest study hours in this image and take a closer look at a few days before and after those dates. By analyzing the person's study performance during these dates, we can provide them with insights and awareness about that time period.

I have sorted the dates close to the dates with the highest study time in the PivotTable, along with the study durations. Then, I used the SUBTOTAL function to calculate total number of study hours during these consecutive days, and the average number of study hours per day.

=SUBTOTAL(9,E120:E125)

=SUBTOTAL(1,E120:E125)

The number used as the first argument inside the SUBTOTAL function (9 for sum, 1 for average) determines the type of calculation to be performed. The range argument represents the range of cells on which you want to perform the calculation.

| RESULT | + | |
| COURSE | (Multiple Items) | |

Row Labels	Sum of DURATION
Sun, 24/10/2021	0000:36
Mon, 25/10/2021	0002:16
Tue, 26/10/2021	0003:30
Wed, 27/10/2021	0006:46
Thu, 28/10/2021	0002:20
Fri, 29/10/2021	0001:30
Sun, 14/11/2021	0003:03
Mon, 15/11/2021	0002:16
Tue, 16/11/2021	0003:50
Wed, 17/11/2021	0008:41
Fri, 03/12/2021	0003:39
Sat, 04/12/2021	0004:06
Sun, 05/12/2021	0002:20
Mon, 06/12/2021	0002:16
Tue, 07/12/2021	0002:37
Wed, 08/12/2021	0004:19
Thu, 09/12/2021	0007:04
Sat, 15/01/2022	0002:31
Sun, 16/01/2022	0004:07
Mon, 17/01/2022	0005:34
Tue, 18/01/2022	0007:18
Mon, 12/09/2022	0000:48
Tue, 13/09/2022	0009:18
Wed, 14/09/2022	0001:52
Thu, 15/09/2022	0004:29
Grand Total	**0097:06**

Dates with the Highest Study Time	Sum of Duration	The Average Study Hours Per Day
October 24-29, 2021	0016:58	0002:49
November 14-17, 2021	0017:50	0004:27
December 03-09, 2021	0026:21	0003:45
January 15-18, 2022	0019:30	0004:52
September 12-15, 2022	0016:27	0004:06

Based on the analysis of their study patterns over a span of approximately two years, we provided the individual with a reminder of the specific date ranges during which they exhibited the highest level of studying. Our aim is to leverage the recollection of their motivation and discipline during those periods as a means to enhance their performance in the latter half of 2023.