

## **Video: Expectations for Lab 2(8:52)**

**(0:00):**

Today, I'm going to describe the expectations of lab 2. In lab 2 you will analyze your own sleep diary data. You will use statistical tools covered in lessons 5 and 6 to analyze actual data you are familiar with. Let's look at the data. Your data is saved in a data structure titled diary. The data fields include your bed times, your wake times, day caffeine, night caffeine, how long it took to fall asleep, and many other items. In this lab you will not use gender or section. To access fields in the structure you must type `diary.fieldName` to put it in the workspace. MATLAB stores data in a variety of formats and the format used for are data is the decimal data format. In the left of the decimal is the days passed since January 00 and is very large because of that. To the right of the decimal is the time you entered for that field. For example, for my wake time I put in 9am MATLAB saved it as 736570.37500. You take the right of the decimal and multiply by 24 and you get the time of the day. For my bedtime I put 22.5 because that is 10:30pm and MATLAB saved it as 736572.9375. Again we multiply by 24 which is 22.5 or 10:30pm. For this lab we use a format to put the data relative to midnight. 22.5 is actually 1.5 hours before midnight so in this lab we change that to be -1.5. I will post the formula on blackboard.

**(3:00):**

Just like before you need to create a lab 2 directory on your v drive. You also need change your working directory to be this directory. Create a lab 2 script and then copy your processed diary file into this directory. You do not download this data because you are using your own data. The data file is `lastName_firstName_gender.mat` and you can see I'm using my data file. If you are unable to find your data and you uploaded it to blackboard for the homework you can go there to download it.

**(3:54)**

So for part 2 using your data, your script will need to generate a nice looking table with all these statistical indicators for your data: Max, Min, Mean, Standard Deviation, this whole list. Here is the data from my sleep diary, the label are across the top, the data parameters are across the side. To look at my data, the latest that I woke up or my maximum wake up time was 9:15 am or 9.25. The earliest I woke up was right before 5 am. My mean wake up time was 7 am with a standard deviation of 1.6 hours. The latest I went to bed was 2 am. The earliest I went to bed was -1.5 hours before midnight which is 22.5 hours after midnight which correlates to 10:30 pm. The longest time I was asleep was 10 hours and the shortest was 4.5 hours. You also need to calculate the percentage of days used an alarm, day caffeine, night caffeine, took a nap. You know how to calculate the total and you know the denominator is the total days of the sleep diary, so you just do the math that way. Across the bottom is the percentage of days I used an alarm and day Caffeine, I always do that so it's 100% but I don't do night caffeine. You also need to generate these graphs which is where lesson 6 comes in. You need a standard deviation error bar for average wake up times you also need one for average total hours of sleep and two additional graphs. Here is my mean wake up time with standard deviation error bars. Mean is in the middle at 6.5 and remember I had about 1.5 standard deviation so that is just over 8 and before 5. This is one of the two additional graphs with mean wake up times by day of the week. Across the bottom is the day of the week. Notice we did not start on Sunday If you remember we started collecting on Wednesday night which means the first day data will be applied to Thursday. The wake up time is across the y axis. Notice my average wake up time on Tuesday and Thursday are both about 5am and they have the smallest standard deviation. On those days I use an alarm so I wake up pretty reliably. Those are the days that I teach so I want to be on campus early. My

widest standard deviation error bars are on the weekends, Saturday and Sunday which is probably typical with everyone. Wednesday is also a wide standard deviation which is not typical for someone with a Monday-Friday job.

**(7:42):**

Don't forget to publish the results. You also need to analyze them just like in lab 1 you will right about the in bullet point form write 3 bullet points on the statistical indicators and 3 bullet points about your graphs. It is best if you cut and paste your graphs into the word document so the grader knows which graph you are talking about. Some issues you might want to consider are what your schedule is like, what are your Monday results because we had a Monday holiday so Monday might be different from other days because of it. Put the word document in the lab 2 directory, make sure the script is published, then zip up the directory, then submit the .zip file on blackboard.