MatlabFun 2014

Assignment 4 – Due Friday Nov 14th by midnight

Remember to comment your m files using % or Matlab → Text → Comment or using %

help is your friend. Submit the indicated files via email to cogs119a@gmail.com. YourLastName should be replaced by your actual last name.

Please read the instructions carefully. Everything you need to complete the homework is specified. If you are uncertain about something, read the instructions again. If you are still unsure, ask for clarification.

Part 1

Consider Part 1 and Part 2 of Assignment 2. You will extend these programs to incorporate some new material covered in class including writing the data to text files.

A. Write a function called YourLastName_RTData2.m that does everything that YourLastName_RTData.m (from Assignment 2) did, with the following differences:

1) Instead of getting subject number (Subject_Number) and number of trials (NTrials) as user input after starting to run the code, these should be provided as inputs to the function.

2) The minimum number of trials should be 6. If the input to the function for NTrials is less than 6, display on the screen the message “You entered <NTrials> for the number of trials, but the experiment needs to have at least 6 trials. You will be presented with 6 trials.” Of course, you should be replacing <NTrials> with the actual value of NTrials entered as input to the function. Set Ntrials to 6 and proceed.

3) Since Ntrials is an input to the function, it can be odd or even. If Ntrials is > 6, but an odd number, display the message: “You entered <Ntrials> for the number of trials, but for a balanced design, the number of trials should be an even number. You will be presented with <Ntrials – 1> trials.” Of course, you should be replacing <NTrials> and <Ntrials – 1> with the actual values. Set Ntrials to Ntrials – 1 and proceed.

4) Now with Ntrials >= 6 and even, follow the instructions from Assignment 2 such that there are an equal number of left and right hand trials.

5) Your function should and returns MyData, a struct, as output.

Note: When applicable, the messages in points 2 and 3 should be displayed using fprintf rather than disp.

Next, extend YourLastName_RTData2.m such that it writes each trial of the data in a tab-delimited text file named Datafile_<Subject Number> (e.g., Datafile_202.txt). You should write to the text file after each trial, not at the end of running all trials. Your text file should look something like the box below on the left. It will not be exactly the same since your RTs and your randomization of trials will differ.

B. Write a function called YourLastName_RTAnalyze2.m, which performs the same analyses YourLastName_RTAnalyze.m (from Assignment 2) does, but gets data struct (i.e. MyData) as input. It does not return an output.

Modify YourLastName_RTAnalyze2.m such that it writes the analyzed data into a text file called Analysisfile_<Subject Number> (e.g., Analysisfile_202.txt). This file should look like the box on the right (again with your own data, so the numbers will be different).
Please submit YourLastName_RTData2.m and YourLastName_RTAnalyze2.m, as well as the text files the program creates for a subject (e.g., Datafile_202.txt and Analysisfile_202.txt assuming you run and input Subject number 202).

**Part 2:**

Write a program called YourLastName_Birthday.m that plays the “Happy Birthday” song. You don’t have to do the whole song, “Happy birthday to you, happy birthday to you” is fine. You can assume the notes in song are: “G G A G C B G G A G D C G G G E C B A F F E C D C” (you may play in a different key as long as you explain it in the comments). See PlayNotes.m for how to set up sine waves that correspond to the notes on the scale.

Play each note for 0.7 seconds with a pause of 0.3 seconds between the end of the note and the start of the next note. Example: sound (0.7s), silence (0.3s), sound (0.7s), silence (0.3s), etc.

If you really want to play a different song, you can do so, but please explain in your comments.

Submit YourLastName_Birthday.m.