

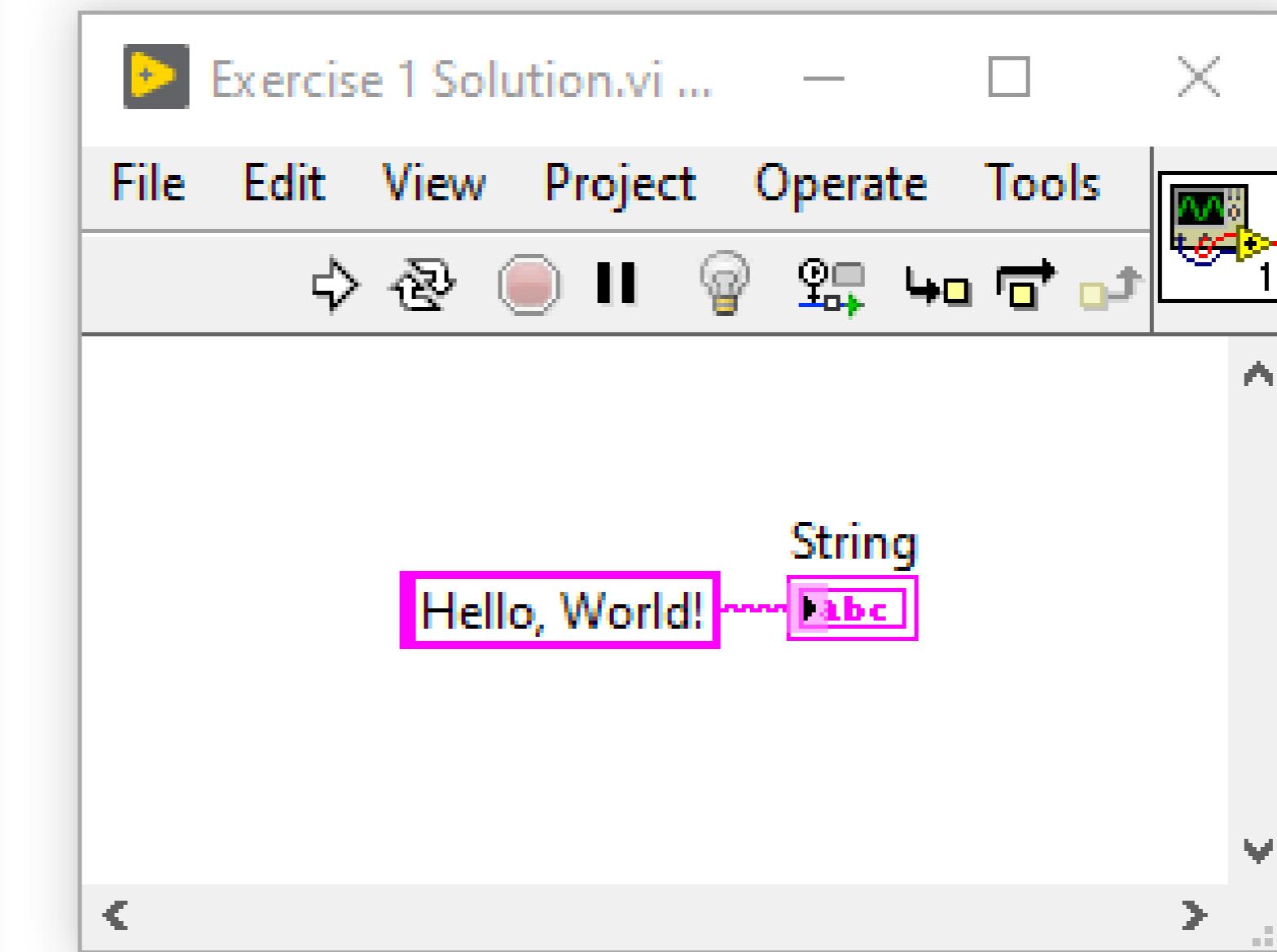
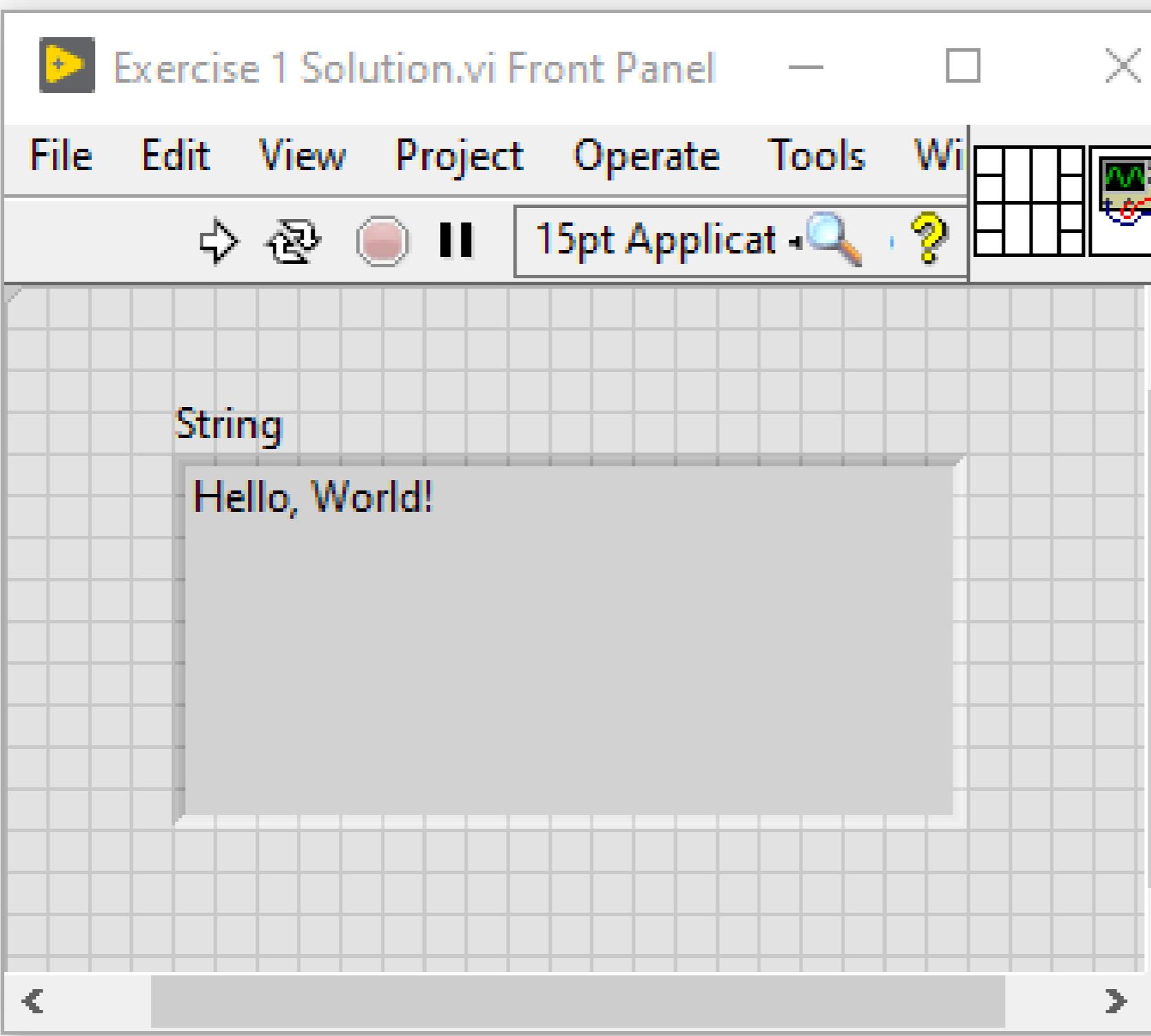


Graphical Programming Languages 1

Workbook Extract

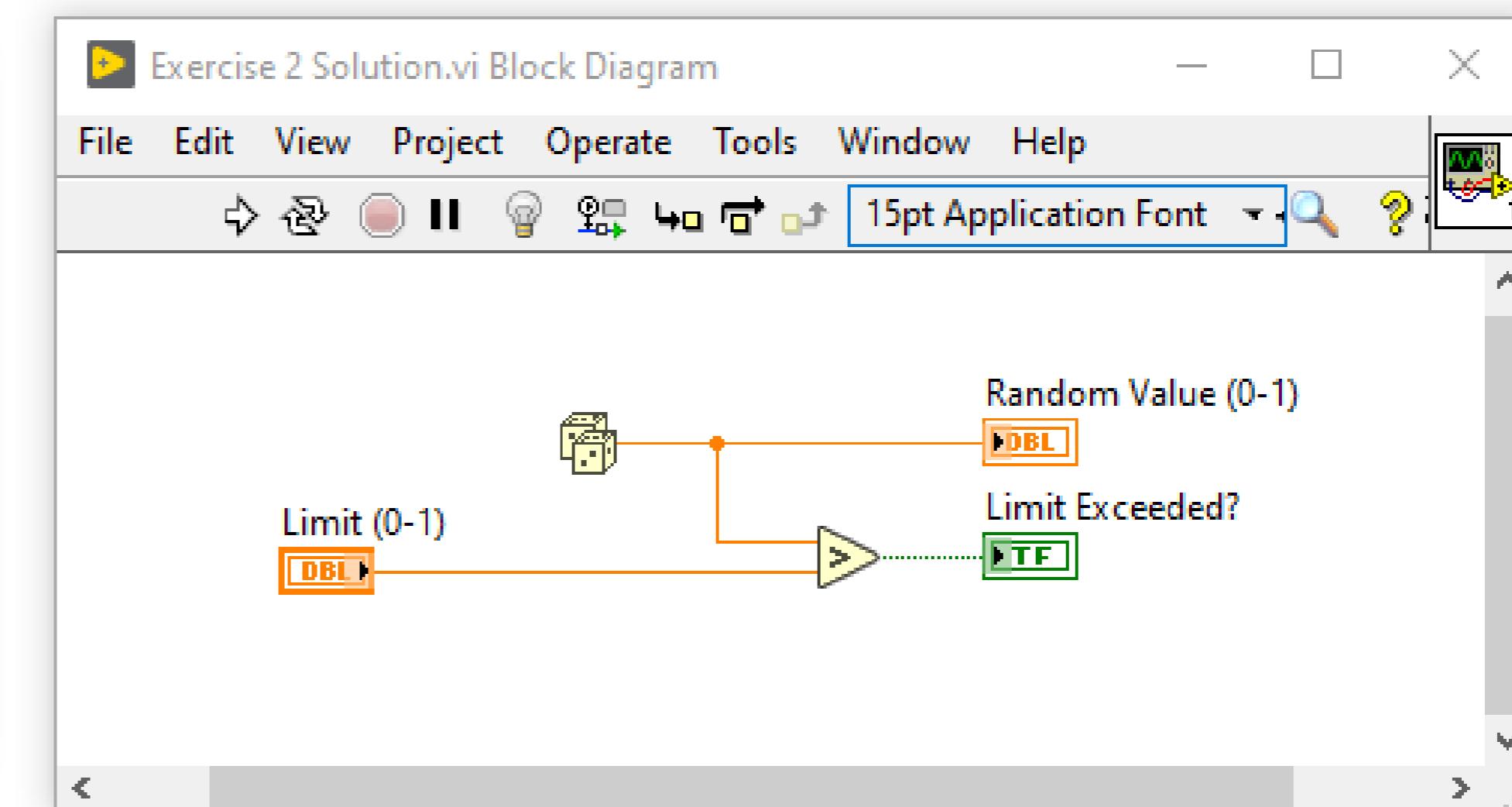
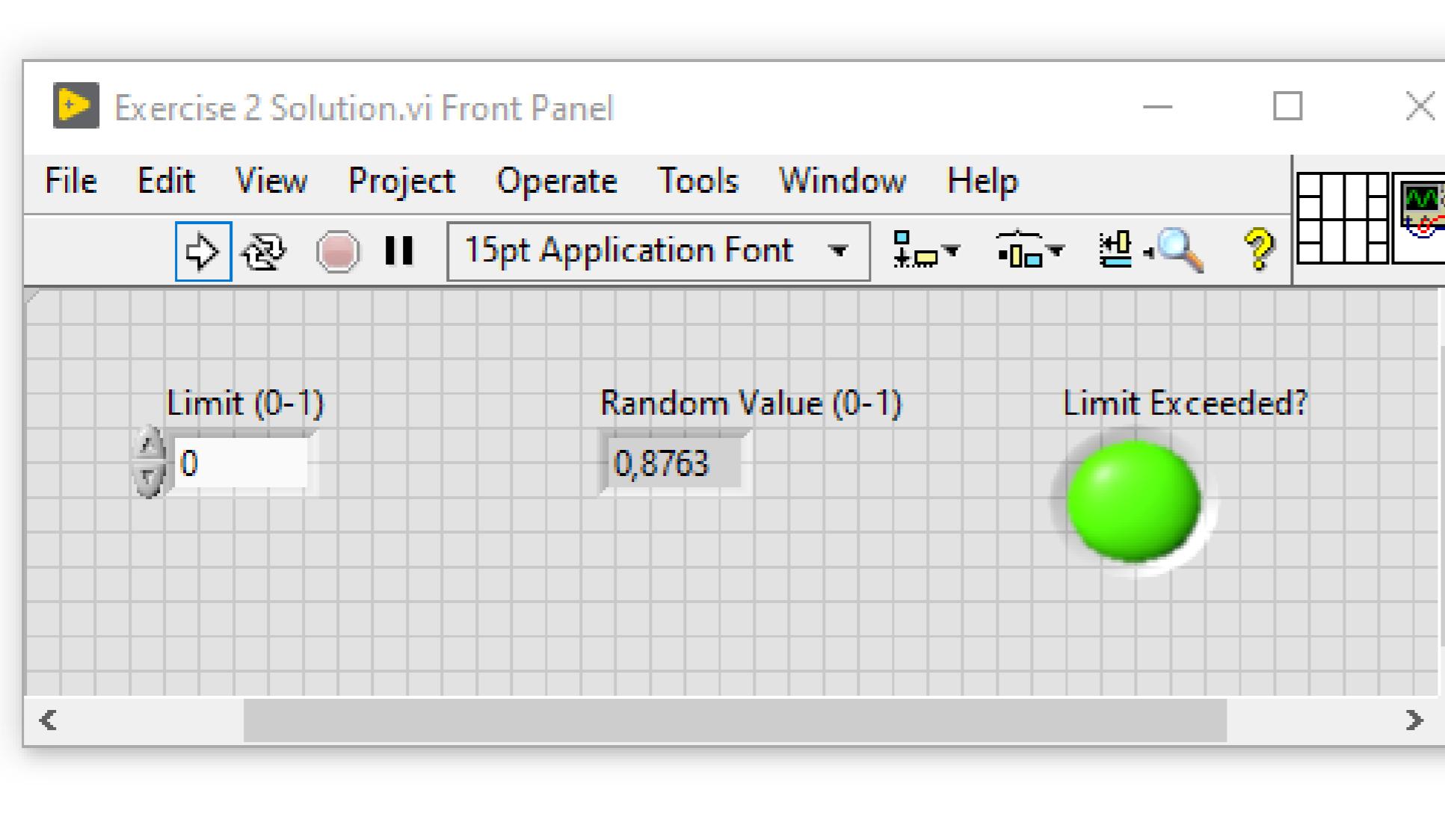
Exercise 1 - Hello, World!

Create an application that displays “Hello, Word” string on the FP.



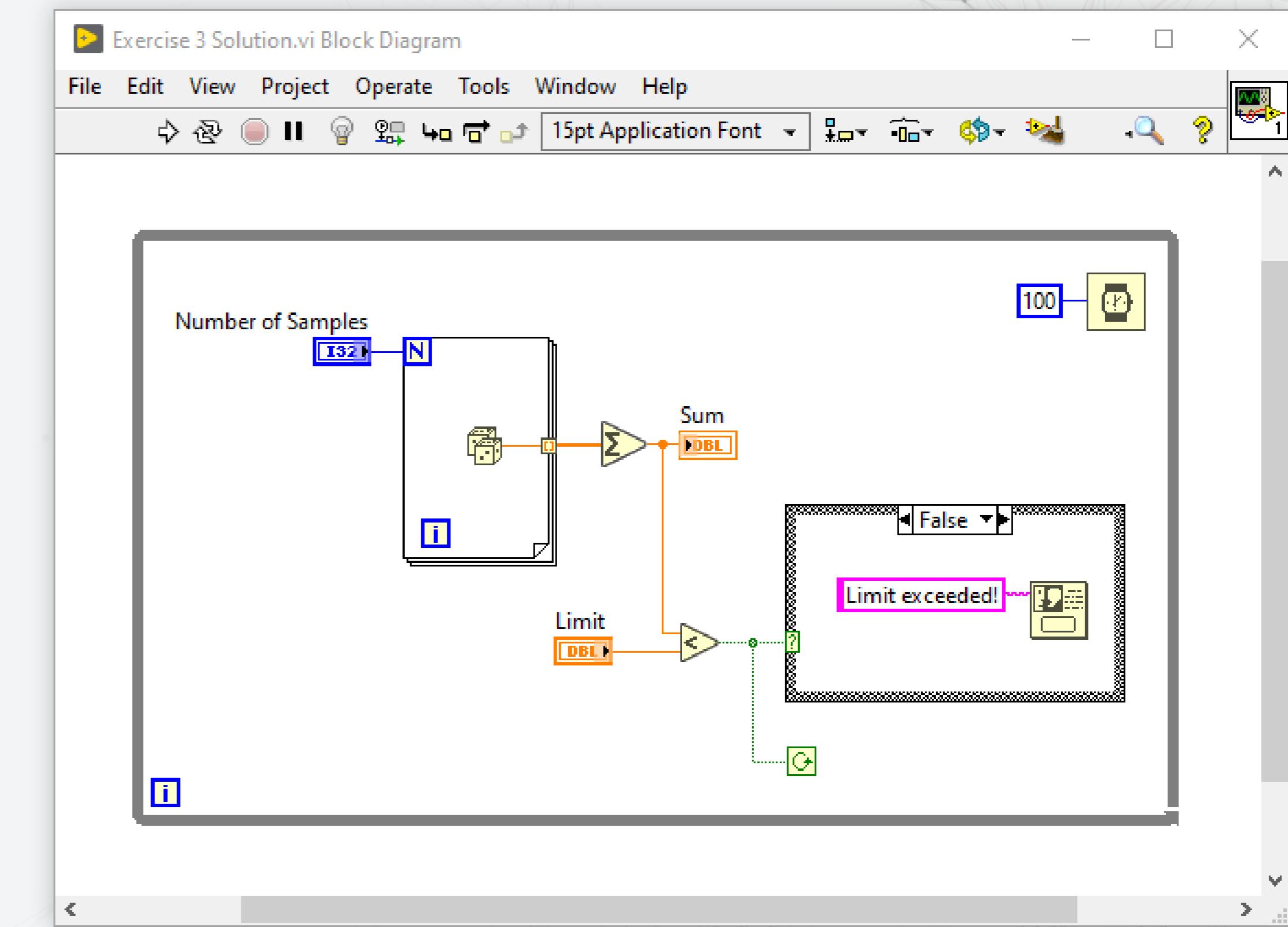
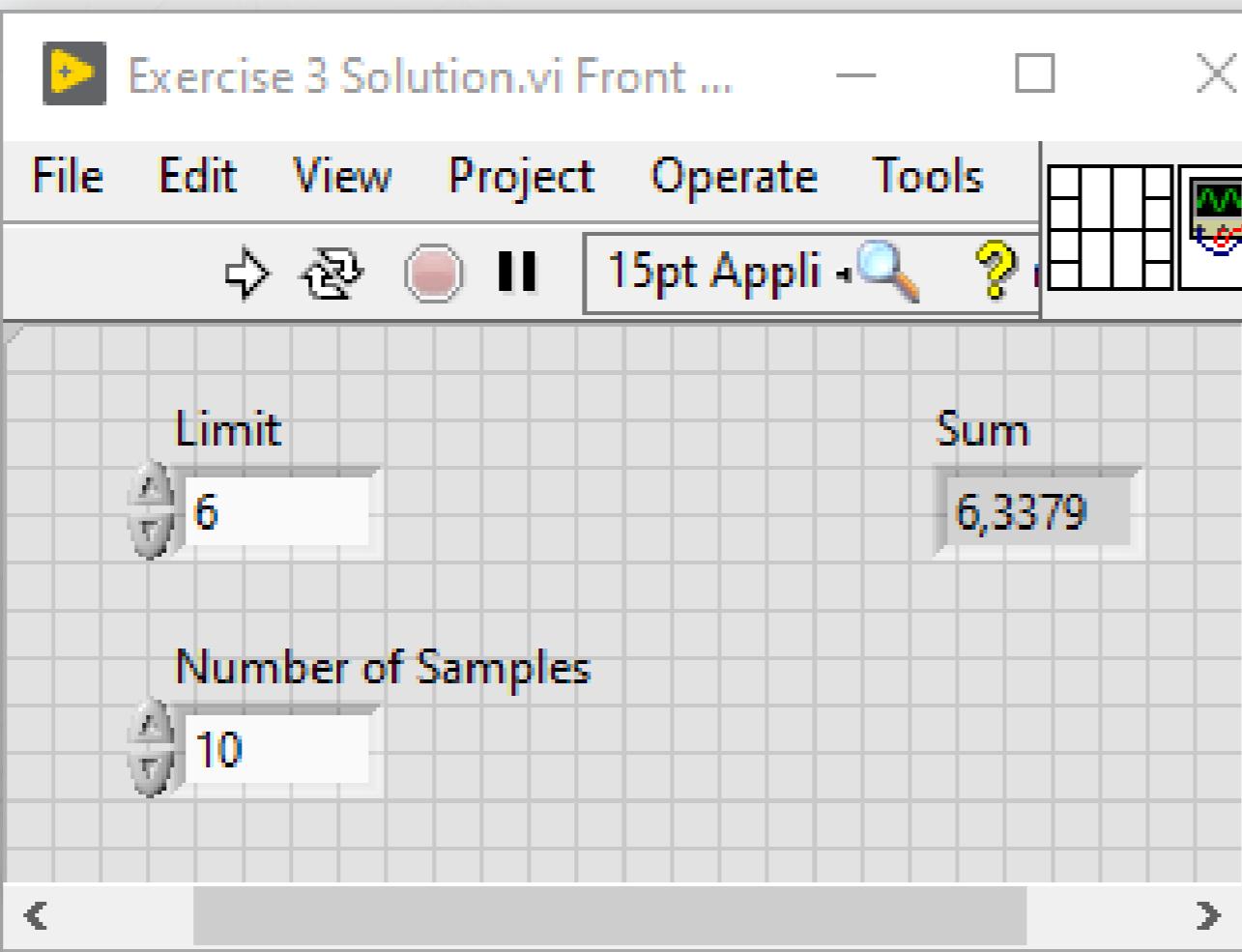
Exercise 2 - First Steps in LabVIEW

Create an application that compares randomly generated number from 0 to 1 with the value entered by the user on the FP. The application displays the generated number and whether the threshold has been exceeded.



Exercise 3 - FOR, WHILE and CASE

Create an application that continuously generates a 1D array and sums its elements. The application stops execution when the sum of the items is greater than the user-defined limit. In addition, a popup should appear informing that the limit is exceeded. The size of the 1D array is user-defined and the array should contain randomly generated values.

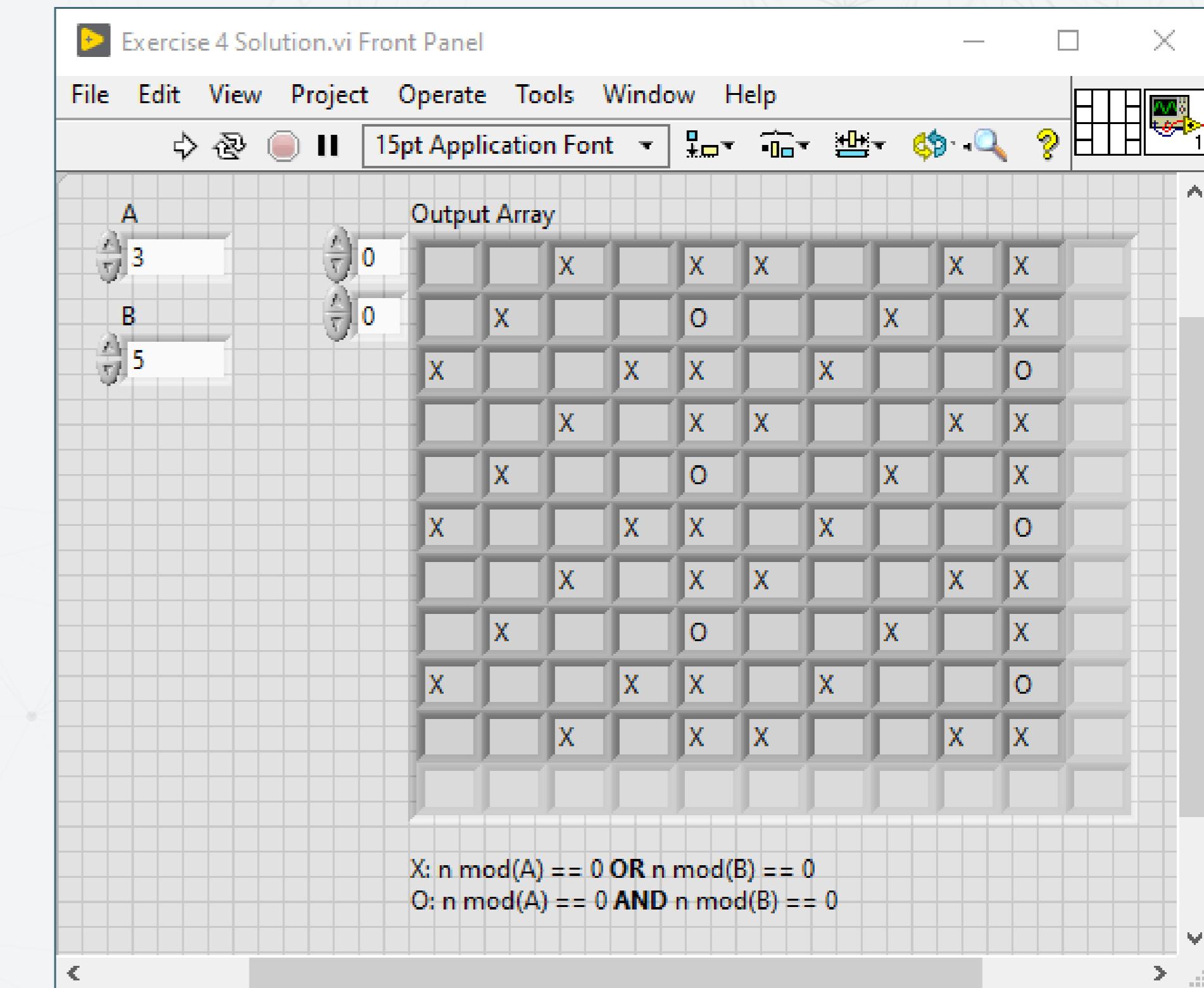


Exercise 4 - Basic Data Types

Create an application that checks whether numbers from 1 to 100 divide without remainder by two values entered by the user. The application creates 10-by-10 2D array and each element represents one integer. The array should be filled with symbols indicating whether the corresponding integer divides by user-defined values. There are two symbols available:

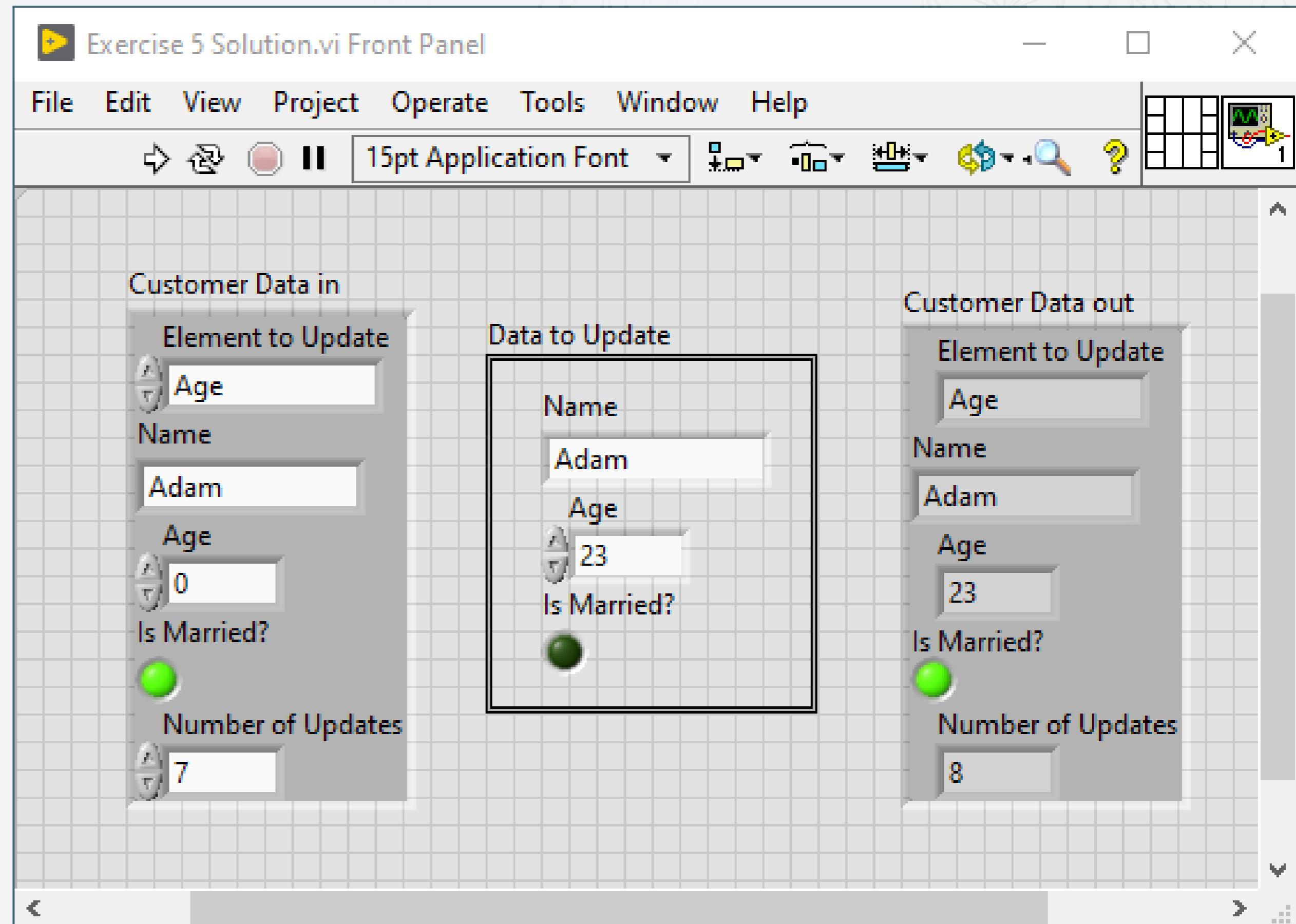
- X – indicates that the corresponding integer has non-zero remainder for exactly one of the two values entered by user, and the remainder of the second value is equal to zero,
- O – indicates that the corresponding integer has its remainder equal to zero for both values entered by user.

The specified array element remains empty if the corresponding integer has non-zero remainders for both values entered by the user.



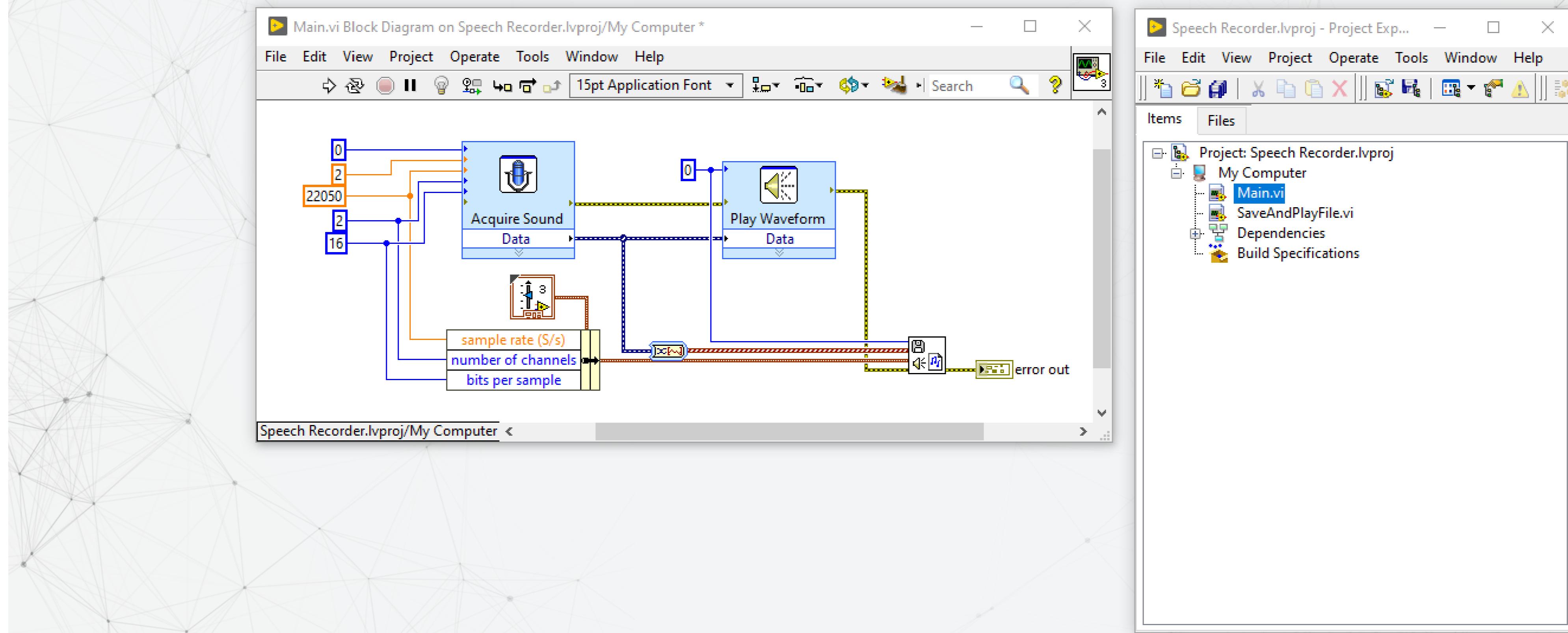
Exercise 5 - Clusters

Prepare a VI that takes a personal data cluster as input and modifies the specified element with the value entered by the user. The item to modify is determined by an enumeration data type (enum) inside the cluster named Element to Update. This enum should have <None> value which allows to execute the VI without modifying the cluster. The VI also increments a Number of Updates element if an update is made.



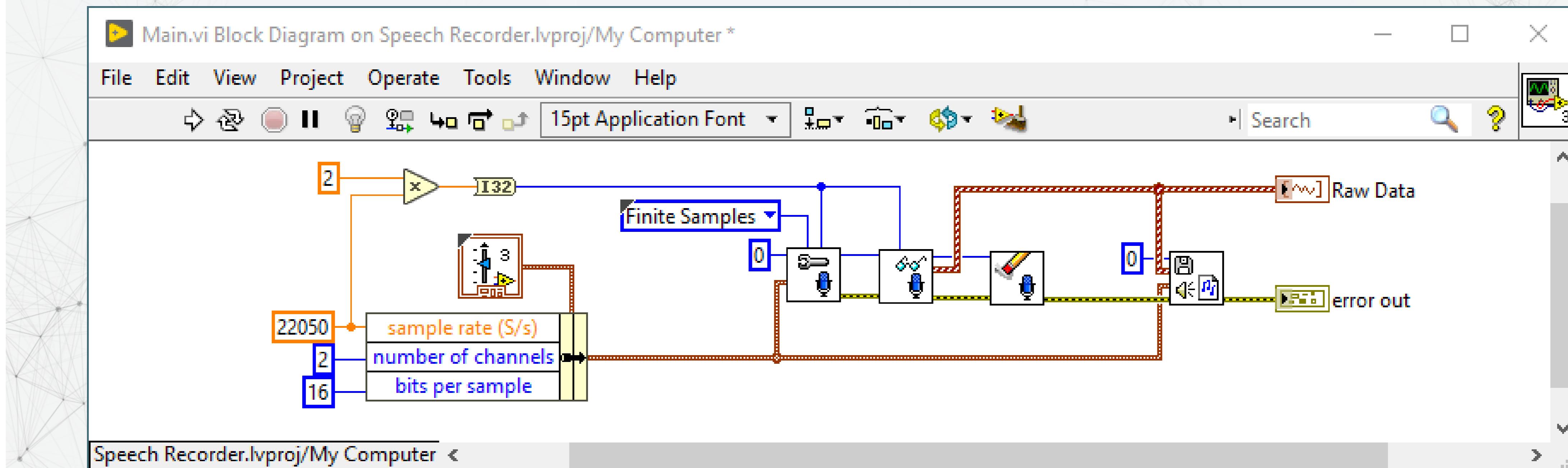
Speech Recorder 1 - Express VIs

Create a LabVIEW project and a VI that takes an audio signal from the computer's sound card, plays it, and saves it to a file.



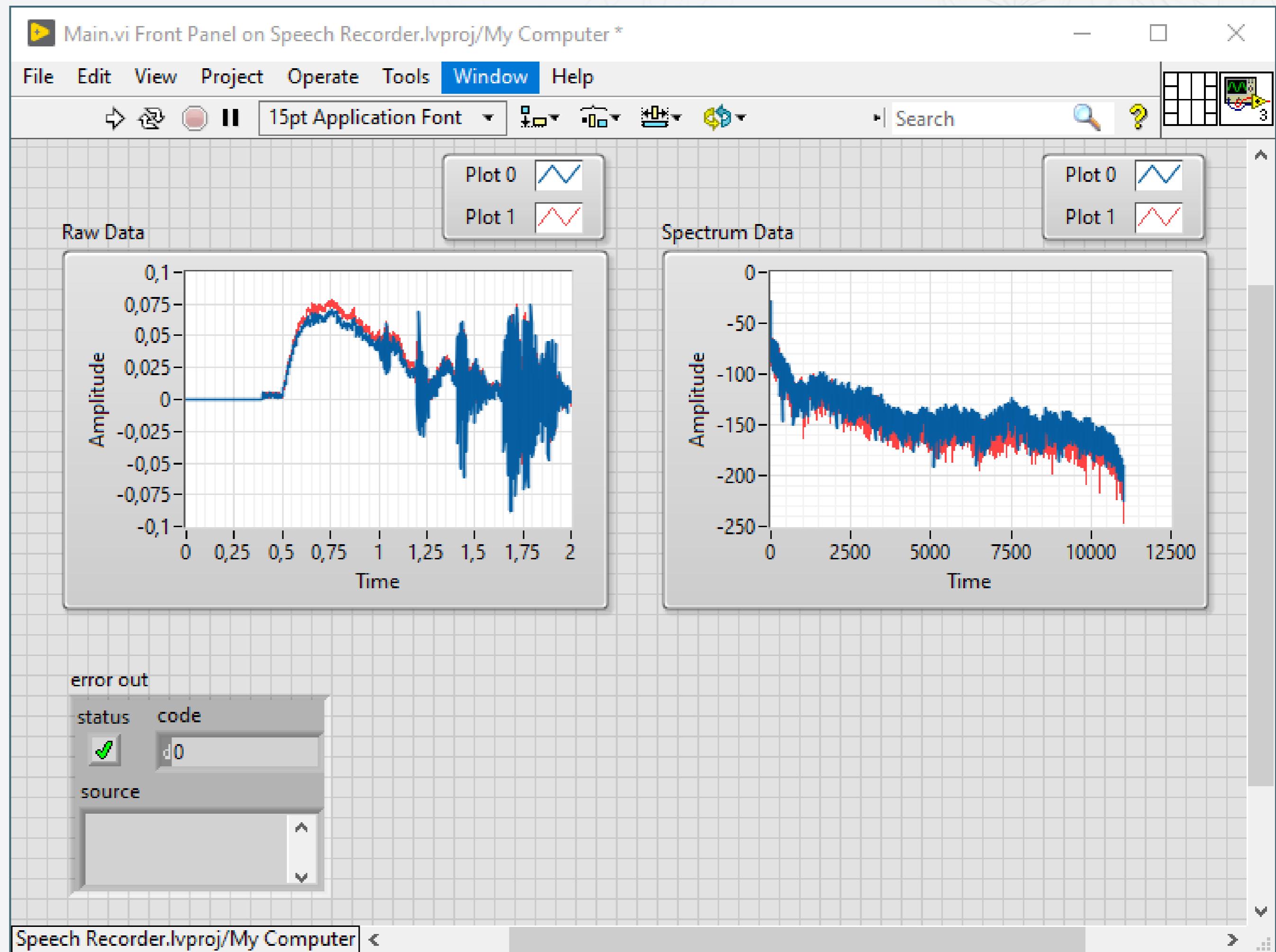
Speech Recorder 2 - Sound Input Functions

Modify the application created in the previous step so the express VIs are replaced with the low level functions. The application should play the recorded sound only once (from the wave file). Display the acquired signal on the FP.



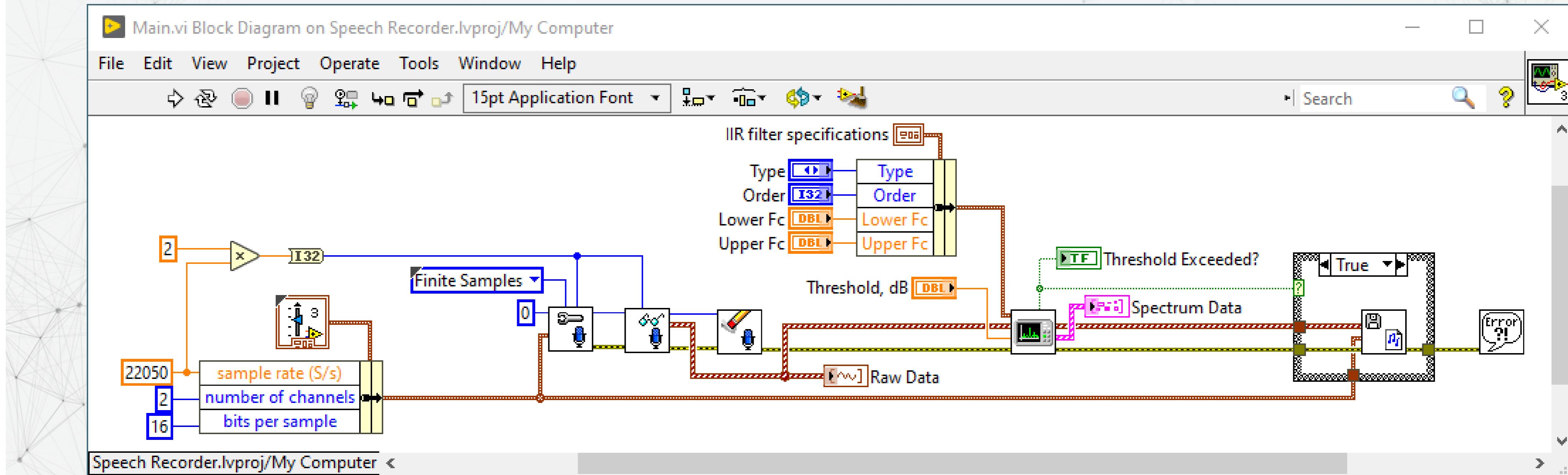
Speech Recorder 3 - Filtering and FFT

Modify the application to calculate the audio signal spectrum (FFT) before saving the audio data to the file. The application should also apply filtering to the signal before computing the FFT. Add the function of saving the signal to the file only when the signal level is higher than the defined threshold.



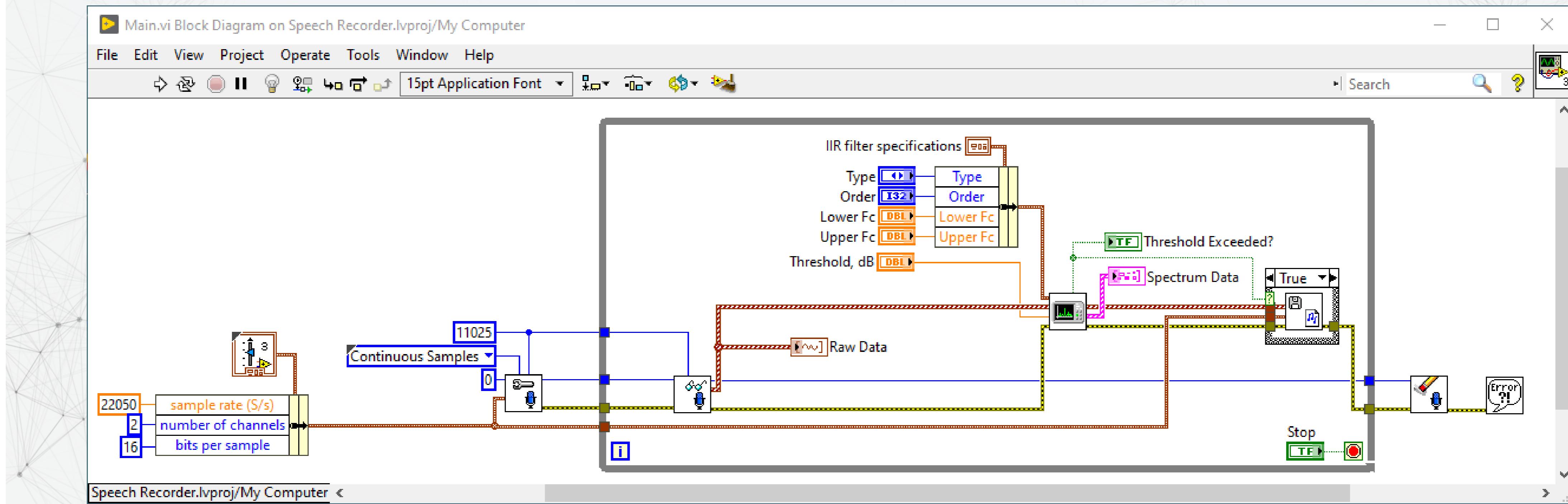
Speech Recorder 4 - Code Clean-up

Modify the application so that the signal analysis feature is now encapsulated in a subVI. The threshold value and filtering parameters should be defined by the user. Add simple error handling.



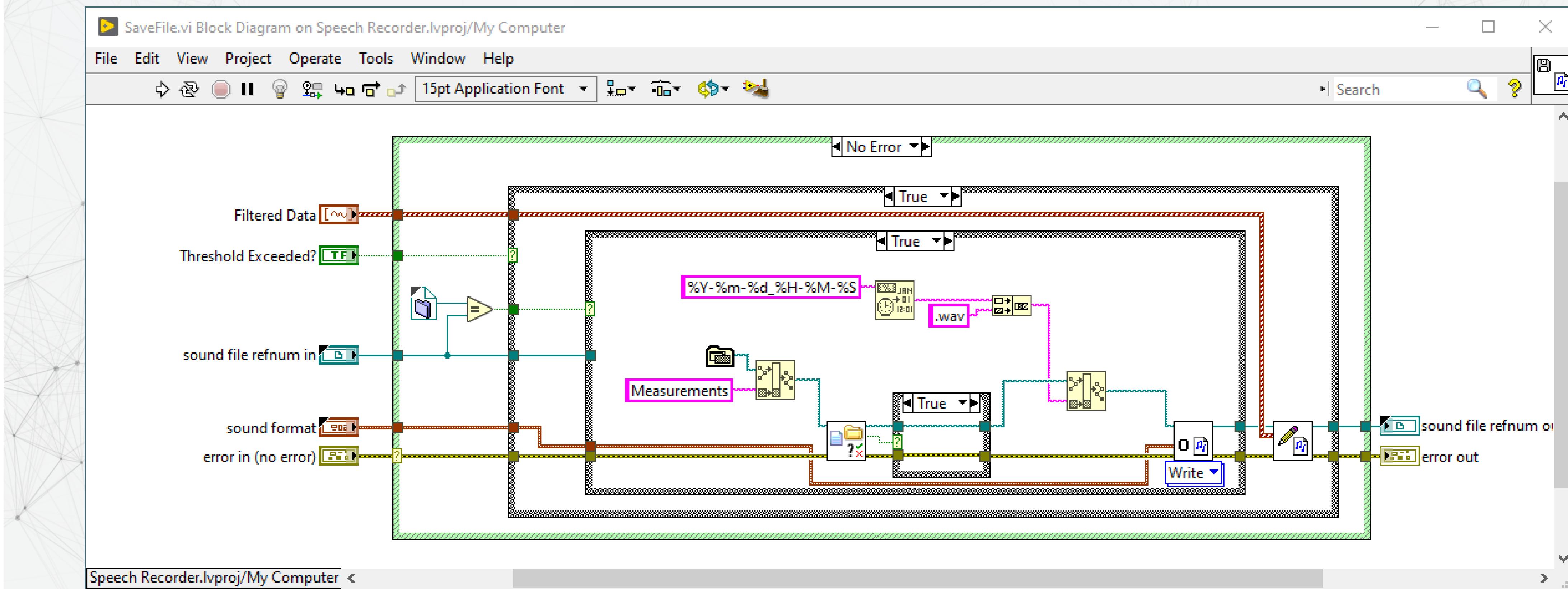
Speech Recorder 5 - Continuous Acquisition

Modify the application by implementing continuous acquisition. The user should be able to stop the application.



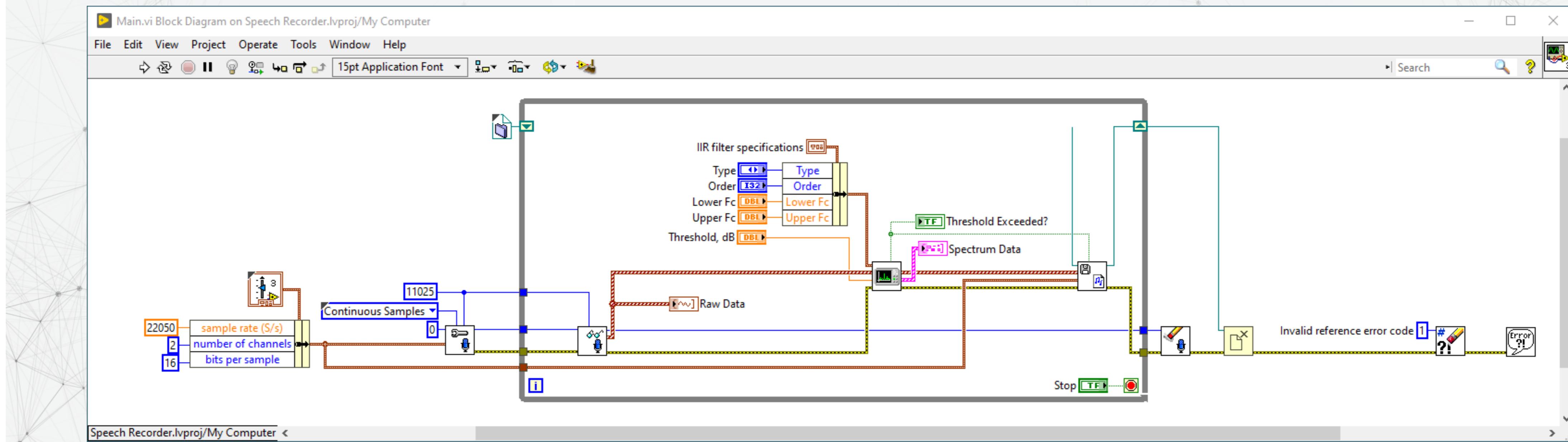
Speech Recorder 6 - File Saving SubVI

Modify the subVI responsible for the file saving operation. This subVI should create a new file every time the signal exceeds the requested threshold and close the file once the signal drops below the threshold.



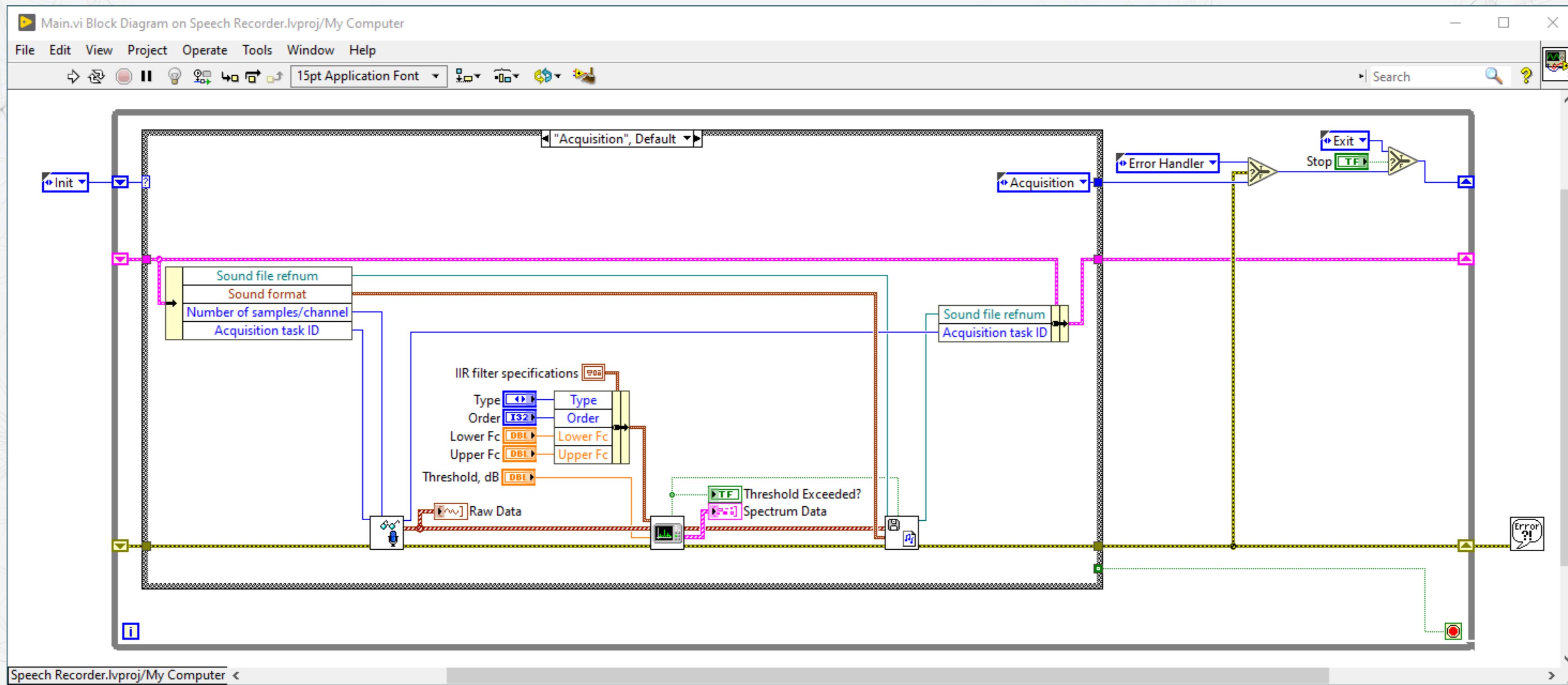
Speech Recorder 7 - Integrating VIs

Modify Main.vi so it utilizes the subVI created in the previous step. Add logic to prevent memory leaks when the application is closed.



Speech Recorder 8 - State Machine

Modify the application architecture to follow the state machine pattern.



Speech Recorder 9 - Event Logging

Add event logging to the Speech Recorder project.

