Lab 4

VisualDSP++ 4.5 Revisited

4.1 Introduction to Plotting Commands

A picture is worth a thousand words

is rightly said. The characteristics of a signal are best understood and the discontinuities and the errors are more likely to be debugged with the help of a plot. VisualDSP++ provides its users with the facility of drawing and manipulating plots easily and effectively.

Say we have an array *a* of type int of 20 elements. For plotting the program array in VisualDSP++ 4.5, click View dropdown menu, from the Debug submenu, go to Plot and Select New. In the Plot configurator, set the Plot type as Line Plot. We wish to plot array *a*, so put the Address as *a*. Select Data as int. The array *a* is of 20 integers, and we wish to plot all of them, so we make Count equal 20 with a stride of 1. Give a suitable Title and Name. The procedure should match the display of Fig. 4.1.

Click Add and then OK. The plot will appear as shown in Fig. 4.2.

We right click on the plot and select Modify Settings. Here, we can configure the plot according to our liking.

4.2 Practical

Generate two arrays of type int in VisualDSP++ 4.5. Consider these arrays as vectors and perform the dot product between the two arrays.

4.3 Hints

The syntax of VisualDSP++ 4.5 is the same as C. So one can generate integers easily. The dot product of two vectors *a* and *b* is equal to

$$a.b = \sum_{n=0}^{N-1} a[n]b[n] \tag{4.1}$$

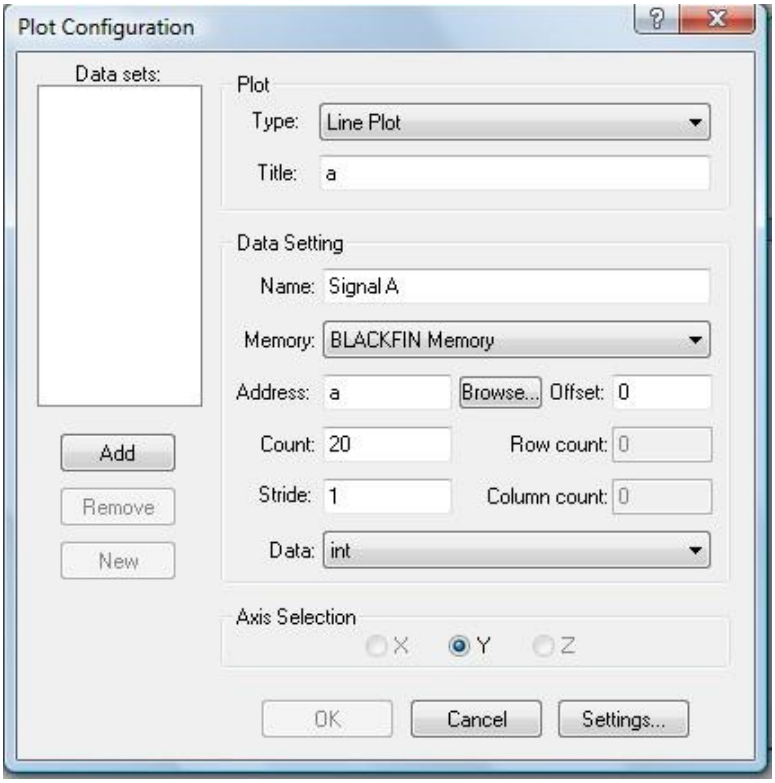

Figure 4.1: Screen Shot of the Plot Configurator

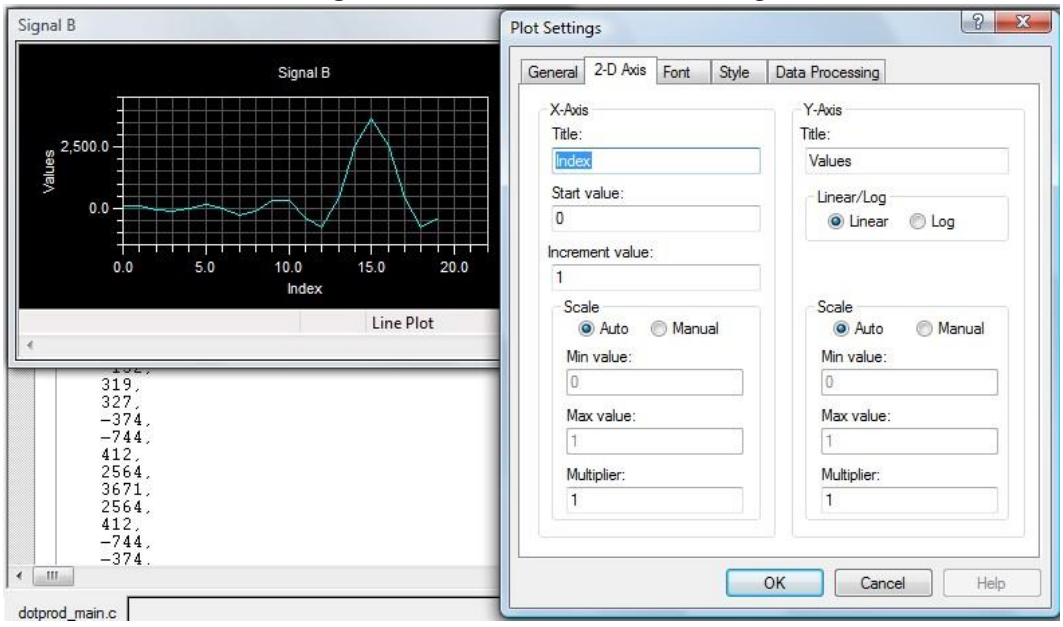

Figure 4.2: Screen shot of the plot generated in VisualDSP++ 4.5

4.4 Tasks

1. Add and Subtract two vectors, element by element. Plot the output vector.

2. Perform the cross product of two integer arrays.
3. Plot one vector with respect to the other vector.
4. In the above procedure, convert the plot display to dB scale.
   Hint: The decibel (dB) is a logarithmic unit used to measure sound level. It is also widely used in electronics, signals and communication. The dB is a logarithmic way of describing a ratio. The ratio may be power, sound pressure, voltage or intensity or several other things.
5. Define a short type vector a. Square each of its element. Display the vector and its Square on the same plot with di*ff*erent color schemes.
6. Write a program in VisualDSP to reverse the order of bits in an 8-bit variable.