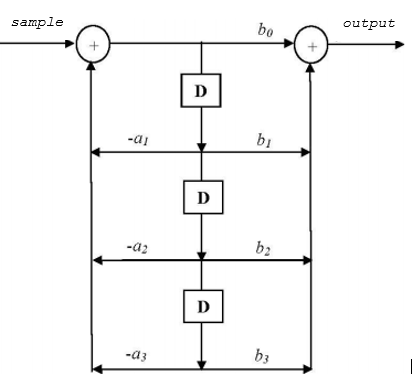
**Direct Form 2**

To implement the direct form 2 filter, we consider each adder shown in figure ----- as two separate variables, left and right.

For every new sample that is received, the existing samples in the buffer are shifted down, and the relevant filter coefficients are applied, the results of which are added to the respective variable: left for the a coefficients, and right for the b coefficients.

The new sample is then added to the left adder, which is multiplied by b[0] and added to right to create the final value of the output. Lastly, the current value of left is assigned to the first element of the buffer, to be ready for the next cycle.



**Direct Form 2 Transpose**

