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| **Experiment Number** | **07** |
| **Date of Experiment** | 06/11/2023 |
| **Date of Submission** | 20/11/2023 |
| **Name** |  |
| **Roll Number** |  |
| **Section** | ECS-01 |

**Aim of The Experiment :-**

Realization of FIR/IIR filters in DSK-TMSC6713 processor Kit in real time.

**Equipment and Software Required:-**

The Equipment and Software required are as follows:

* DSP processor kit ( DSK-TMSC6713 processor kit )
* Code Composer Studio (CCS v-5)

**Code:**

#include "DSK6713\_AIC23.h" // codec support   
 Uint32 fs=DSK6713\_AIC23\_FREQ\_8KHZ; //set sampling rate

#define DSK6713\_AIC23\_INPUT\_MIC 0X0015  
 #define DSK6713\_AIC23\_INPUT\_LINE 0x0011

Uint16 7inputsource-DSK6713\_AIC23\_INPUT\_LINE; // select line in

#include "ave5f.cof" //filter coefficient file  
 float x[N]; //filter delay line  
 interrupt void c\_int11() //ISR  
AIC23 codec interrupts at 8kHz  
{  
 short i;  
 float yn 0.0;  
 x[01 = (float)(input\_left sample()); //get new input into delay line

for (i=0; i<N; i++) //calculate filter output

yn+h[i]x[i];

for (i=(N-1); i>0; i--) //shuffle delay line contents

x[i] = x[i-1];  
output left sample((short)(yn)); //output to codec  
  
return;

}

void main() //main body of program does nothing  
 {  
 comm intr(); //initialise DSK  
 while(1); //infinite loop

}

**Discussion or Inference of the experiment:**

In this experiment, we implemented FIR/IIR filters in real time using a DSP processor kit (DSK-TMSC6713 processor kit), and we measured the responsiveness of the system by looking at the latency between the input and output signals. The main focus of our analysis was the computational efficiency of the DSK-TMSC6713 in FIR/IIR.We utilized an audio file from the system, applied FIR and IIR filters to it, and then examined the output signal using an audio output device.We used the C programming language to script the code.

**Conslusion:**

Through this experiment, we learned how to set up a DSP processor kit (DSK-TMSC6713), connect it to a computer, run code on the hardware using CCS, use external files (in this case, audio) on the DSP processor kit, and execute FIR/IIR filters in real-time. We gained knowledge of the FIR/IIR filters' characteristics, uses, and effectiveness as well as the issues that arise when using them with DSP processors.