/\*

\* main.c

\*/

#include <stdio.h>

#include "usbstk5515.h"

#define IR\_length 11 //order of the filter+1 for FIR, order/2 +1 for IIR

#define In\_length 51//length of input signal

#define tmp\_l IR\_length+In\_length-1

//Int16 x[In\_length]={0,-0.444187694242542,1.11161458152269 ,-0.692511417431522, 1.13453150278800, 0.217050684900274, 0.259831852292812, 1.41810836879558, -0.276532563023852, 1.67732357322804, 0.335105343698138 ,0.846964681976350, 1.51265027017955 ,0.0334522352304312, 1.96568938942877 ,0.282618556974890, 1.21899886142051, 1.33831426594953, 0.172694995144365, 1.94409936636801, 0.0360001296116871, 1.33092788499163, 0.896895116307150, 0.129641008123333, 1.62090833547228, -0.372055875437849, 1.19874107563736, 0.251333933762619, -0.0528212706733244, 1.06609496313606 ,-0.858635831841282, 0.892468351089180, -0.486529571512032, -0.290127323348700, 0.394769638135721, -1.30971605273023, 0.516395280119471, -1.18010108046927, -0.479536020072890, -0.259556248665205, -1.60772185494710, 0.181477394843222, -1.69838749672039, -0.528412087112194, -0.775496780623494, -1.66081384270062, -0.0231484569822220, -1.94534876983342, -0.380147895071677, -1.07079127226445, -1.42669607998561};//Input-1: Input signal;

//Int16 x[In\_length]={0 -1819.39279561745 4553.17332591693 -2836.52676579951 4647.04103541965 889.039605351523 1064.27126699136 5808.57187858670 -1132.67737814570 6870.31735594206 1372.59148778757 3469.16733737513 6195.81550665545 137.020355503846 8051.46373910025 1157.60560936915 4993.01933637841 5481.73523332926 707.358700111318 7963.03100464339 147.456530889470 5451.48061692573 3673.68239639409 531.009569273173 6639.24054209445 -1523.94086579343 4910.04344581061 1029.46379269169 -216.355924677937 4366.72496900532 -3516.97236722189 3655.55036606128 -1992.82512491328 -1188.36151643628 1616.97643780391 -5364.59695198303 2115.15506736935 -4833.69402560213 -1964.17953821856 -1063.14239453268 -6585.22871786334 743.331409277836 -6956.59518656672 -2164.37590881155 -3176.43481343383 -6802.69349970174 -94.8160797991814 -7968.14856123771 -1557.08577821359 -4385.96105119518 -5843.74714362108

Int16 x[In\_length]={0 ,-1819.39279561745, 4553.17332591693, -2836.52676579951, 4647.04103541965, 889.039605351523, 1064.27126699136, 5808.57187858670, -1132.67737814570, 6870.31735594206, 1372.59148778757, 3469.16733737513, 6195.81550665545, 137.020355503846, 8051.46373910025, 1157.60560936915, 4993.01933637841, 5481.73523332926, 707.358700111318, 7963.03100464339, 147.456530889470, 5451.48061692573, 3673.68239639409, 531.009569273173, 6639.24054209445, -1523.94086579343, 4910.04344581061, 1029.46379269169, -216.355924677937, 4366.72496900532, -3516.97236722189 , 3655.55036606128, -1992.82512491328, -1188.36151643628, 1616.97643780391, -5364.59695198303, 2115.15506736935, -4833.69402560213, -1964.17953821856, -1063.14239453268, -6585.22871786334, 743.331409277836, -6956.59518656672, -2164.37590881155, -3176.43481343383, -6802.69349970174, -94.8160797991814, -7968.14856123771, -1557.08577821359, -4385.96105119518, -5843.74714362108};

//Int16 x[In\_length]={0,-14,36,-22,36,7,8,45,-9,54,11,27,48,1,63,9,39,43,6,62,1,43,29,4,52,-12,38,8,-2,34,-27,29,-16,-9,13,-42,17,-38,-15,-8,-51,6,-54,-17,-25,-53,-1,-62,-12,-34,-46};

//Int16 x[In\_length]={1,2,3,4,5,6,7,8,9,1};

Int16 array[tmp\_l] = {0};

void linearbuff();

Int16 \*inPtr;

Int16 \*outPtr;

Int16 \*coeff;

Int16 coefs[IR\_length]={1,1,1,1,1,1,1,1,1,1,1};

Int16 coefs\_zp[In\_length] = {0};

//Int16 coefs[IR\_length]={372.362041275574, 372.362998327493, 372.363742702228, 372.364274399015, 372.364593417305, 372.364699756772, 372.364593417305, 372.364274399015, 372.363742702228, 372.362998327493, 372.362041275574};//Input-2: Coefs signal(coefs of filter)

Int16 input;

Int16 output;

static Int16 buffer[In\_length];

/\*int a=0;

for(a=0;a<In\_length;a++)

{

x[a]=x[a]\*4096;

}

for(a=0;a<IR\_length;a++)

{

coefs[a]=coefs[a]\*4096;

}\*/

//static void dataInput(); // dummy function to be used with ProbePoint

//static void dataCoefs();

void linearbuff(void) // Commented by ketan

{

//int i;

//long int accumulator=0;

int n,k;

long int accumulator=0;

Int16 temp=0;

Int16 temp\_x=0;

//static Int16 buffer[In\_length]={0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0};

// write convolution code here;

for (k = 0; k < IR\_length; k++)

{

coefs\_zp[k] = coefs[k];

}

for (k = IR\_length; k < In\_length; k++)

{

coefs\_zp[k] = 0;

}

for (n = 0; n < tmp\_l; n++)

{

array[n] = 0;

for (k = 0; k < In\_length; k++)

{

// To right shift the impulse

if ((n - k) >= 0

&& (n - k) < In\_length)

{

// Main calculation

temp\_x = x[k]/4;

temp= (temp\_x \* coefs\_zp[n - k]);

//printf("%d\n",temp);

array[n] = array[n] + temp ;

}

//printf("%d\t", y[n]);

}

printf("%d\t", array[n]);

}

//\*/

/\*

write convolution code here;

\*/

(\*outPtr)=(Int16)accumulator;

}

main(void)

{

int i=0,j=0,k=0;

for (k=0;k<In\_length;k++)

{

buffer[k]=0;

}

/\*for (k=0;k<tmp\_l;k++)

{

x[k]=0;

}

\*/

//dataInput();

//dataCoefs();

coeff = &coefs[0]; //coefs is coefficient of impulse response defined in fdacoefs\_int.h

inPtr = &input; //inPtr is a globally declared pointer to a Int16

outPtr = &output;

// SYS\_EXBUSSEL = 0x6100;

// USBSTK5515\_init( );

//int i=0;

for(j=0;j<In\_length;j++) // loop

{

for(i=0;i<j;i++)

{buffer[i]=x[i];}

linearbuff();

//printf("output array =\t");

//for(i=0;i<tmp\_l;i++)

//{printf("%d\t",array[i]);}

//printf("\n");

/\* Read input data and also coefficients using a probe-point connected to a host file. \*/

//printf("x=%d\n",x[j]);

/\*

input=x[j];

//write your code for function call;

array[j]=output;

j=j+1;

\*/

}

//return 0;

}

/\*

\* FUNCTION: Read input signal and write processed output signal

\* using ProbePoints

\* PARAMETERS: none.

\* RETURN VALUE: none.

\*/

/\*

static void dataInput()

{

// do data I/O

return;

}

static void dataCoefs()

{

// do data I/O

return;

}

\*/