Lab.

Objectives and tools

- To implement
  - ☐ Hello world
  - ☐ Out
  - ☐ Inout
  - ☐ a FIR filter
  - ☐ an IIR filter

  on the C6748 LCDK
- Tools:
  - ☐ C6748 LCDK
  - ☐ CCStudio 5.3.0 on a PC with Windows
  - ☐ function generator
  - ☐ oscilloscope
  - ☐ projects (already prepared by the teacher)

Function (or signal) generator

- Normally, floating
- Main controls
  - wave shape (sine, triangular...)
  - amplitude
  - frequency

Oscilloscope

- Normally grounded
- "Crocodile" tip is common, grounded; probe tip is the input
- Main controls:
  - horizontal scale (time/div.)
  - vertical scale (V/div.)
  - coupling (AC/DC)
  - trigger source
  - several trigger options (put mode to "auto")

Some notes

- *Pay attention to possible electrostatic discharges*, especially in dry days
  - grep the PCB (printed circuit board) along its borders
  - don't touch the electronic components
  - don't touch the copper lines of the PCB

- The left channel in the jack connectors should be the red wire, but please check

S/W installation

- Method 1:
  - Copy the TI DVD on the hard disk
  - Install CCS from the hard disk
    - using *ccslicense* for the activation
      - copy the *ccslicense.lic* file in c:\Program Files\ti
    - in c:\Program Files\ti (or c:\Programmi\ti)
    - C6000, C6748, XDS100
- Method 2:
  - Download version 5.3 from http://software-dl.ti.com/ccs/esd/documents/ccs_downloads.html
    - follow instructions for the activation
    - in c:\Program Files\ti (or c:\Programmi\ti)
    - C6000, C6748, XDS100
- Then
  - Copy the *assets* folder in c:\Program Files\ti
  - Copy the *projects_basic* folder on the desktop

Starting CCS

- Connect the LCDK to the PC using the XDS100v2
    - dip switch: all off, i.e. towards the jack connector
- For *inout* and *fir_filter*: line in at the top, line out at the bottom
- Open CCS
- *File… new… target configuration file… file name*: nameNewTargetConfiguration.ccxml,
    - set *use shared location* (or not?)
    - emulator: *xds100v2*
    - *LCDK6748*
- Save

Loading, compiling and running projects

- *View/project_explorer*
- *project… import existing CCS eclipse project…*
- it may be necessary to correct
  - the user name in the *.project* file of each project
  - the path for the *include* in "assets"
    - show build settings... C6000 compiler... include options
  - the path for the *lib* in "assets"
    - show build settings... C6000 linker... file search path
- in *file/properties*, or in *project properties*
  - build.. c6000 compiler
  - optimization
  - advanced options / assembler options: keep asm files
    - the asm can be found in the Debug folder
- (in edit mode) *build*
- *debug* (moves to debug mode)

Our interrupts

The 6748 has 128 interrupt sources, but room for only 16 ISRs (interrupt service routines)
*   12 interrupts can be programmed [tms320c6748.pdf, p. 92]
*   interrupts 0 to 3 are RESET, NMI and 2 reserved

For our interrupt:
*   MCASP0 (multichannel audio serial port 0) generates the event EVT 61 [tms320c6748.pdf, p. 93]
*   61 (i.e. 0x3d) is written in the low part of the register INTMUX1 [L138_LCDK_aic3106_init.c, line 655]
*   the low part of the register INTMUX1 is associated with the interrupt INT4 [L138_LCDK_aic3106_init.c, line 653, and sprufk5a.pdf, p. 178]
*   the routine associated with INT4 (its code is in main.c) is *interrupt 4* [vector_intr.asm, line 48]

Designing simple filters with Matlab

- For e.g. a FIR passband filter
    - b=fir1(15, [0.2 0.3]);
    - freqz(b);
    - zplane(b);
- For e.g. an IIR passband filter
    - [b,a]=butter(15, [0.2 0.3]);
    - freqz(b,a);
    - zplane(b,a);