Instituto Superior de Engenharia do Porto

Tips & Tricks using DAVE v4

Mestrado em Engenharia Eletrotécnica e de Computadores

Power Control Curricular Unit

Rui Brito – Mars 2017

Agenda

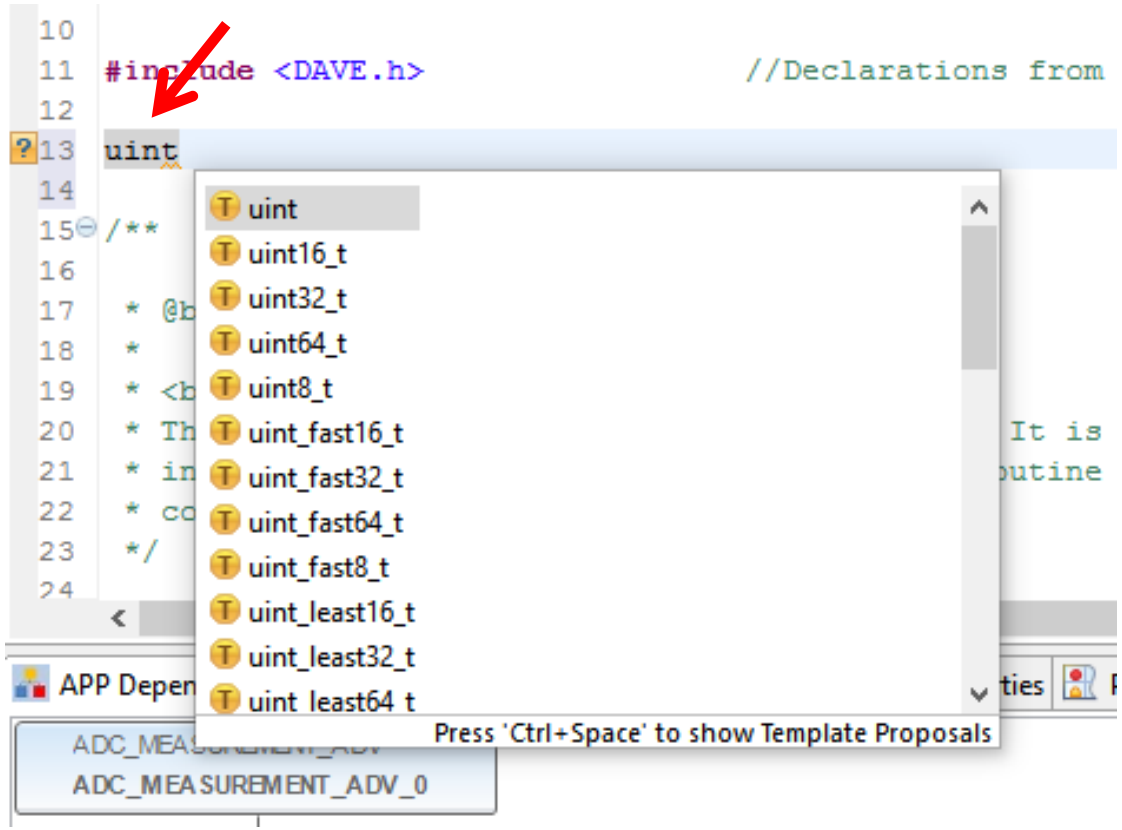
- ✓ General Tips and Tricks
- ✓ Using the right variables
  - ✓ Ctrl + Space bar
- ✓ Measuring a program execution time
- ✓ Moving Average Filter
- ✓ Improving the program execution time

General Tips and Tricks

- ✓Selecting the “Active project”
  - ✓Right click on the project you want to work in and select the option “Set Active Project”; The “Active project” comes in Bold
- ✓Reset (windows) perspective in order to rearrange the windows
  - ✓Window→Reset Perspective…
- ✓APPs Help
  - ✓Right-click on a APPs and select “APP Help”
- ✓Infineon Forums - Search the Internet for:
  - ✓Infineon XMC forum
  - ✓Infineon DAVE forum

Using the right variables

- ✓When typing for a new variable press Ctrl + Space bar to show template proposals



Floats

- ✓Never forget to add a “.0F” when using floats
  - ✓Use float=3.1416F; instead of float=3.1416;
  - ✓Use float=10.0F; instead of float=10;
  - ✓The XMC microcontroller has a kind of processor for floats; the use of “F” shorts the operations execution time

Measuring a routine execution time

- ✓A periodic routine execution time, e.g., a PWM “Period Match Interrupt” routine can be measured using an Oscilloscope or an Logic Analyzer by:
  - ✓Putting a Pin at level logic one when entering the interrupt routine;
  - ✓Putting a Pin at level logic zero before leaving the interrupt routine;
  - ✓Measure on the oscilloscope the Pin “level logic one” time duration.

- ✓In the same way an ADC time conversion can be easily measured if the ADC is triggered by a PWM which signal is compared with a Pin signal that is set to “level logic one” at the beginning of the ADC Interrupt routine.

Moving Average Filter MAV– simple code

```
// Window filter
float x_new=0.0F;
float x_sum=0.0F;
float x_vec[10];
float x_average=0.0F;
uint8_t x_counter = 0;
const uint8_t x_counter_max = 10; //Window filter with 10 positions

// Window filter array initialization (run it once)
for (x_counter=0; x_counter < x_counter_max; x_counter++)
        x_vec[x_counter] = 0;
x_counter = 0;
```

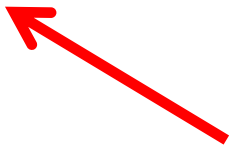
Variable declaration

The MAV is also known as Window filter

Array initialization with zeros

Moving Average Filter – simple code

```
// Window filter "with x_counter_max" positions
x_sum = x_sum - x_vec[x_counter] + x_new;
x_vec[x_counter] = x_new;
x_counter++;
if (x_counter > x_counter_max-1)
        x_counter = 0;
x_average = x_sum/x_counter_max;
```



The execution time of this code is independent of the number of array positions