Fixed point number

- Fixed point arithmetics is used in embedded systems where the processors' calculation rating is small. The a im is often to save energy/battery and realtime control (ohjaus?) of actuators (speed).

- The design team decides where the comma should be.

- E.g., a device moves 8m/s both directions and uses a 16-bit microcontroller. The place for the comma could be following:

- +/- 111, 1000 0000 0000 => 7,5m/s and if the rest of the decimals are ones, then 7,99 m/s, which is a sufficient time for many applications. The first bit is the sign bit.

Exercise

Write your birth date_____. Convert all numbers (digits?) to fixed point number so that the comma comes after the date and the number range is 16 bits. All dates must be presented in the integer part of number . E.g. when the birth date is 18 February 77, so the first convertable number is now 18,0277. Remember that the first bit to the right of the comma has value 0,5 the next is 0,25   0,125   0,0625…….

This way you can perform the conversion with sufficient accuracy relatively fast. Return to Moodle.