In this lab, we will develop a program that, in effect, works as a digital voltmeter. There are in total 2 assignments in this lab: an external digital-to-analogue converter and analogue-to-digital converter. A external D/A converter will receive the input in binary codes and will output it in analogue form, while the A/D converter do it vice-versa.

The board will be connected to the external D/A Converter and the stop button and send the result out through the 7-segment display.

weighting conversion method :

first, an output is a binary number with only MSB set. Then the comparison of the corresponding output voltage Uout with the input voltage Ue is done. If Uout is less than Ue, the voltage level at PG(0) is set to high level. If Uout is more than Ue, the comparator puts out a low level. So, the decision whether the MSB should be cleared or not is determined

The sequence of these steps is holded for all remaining bits and as a result we get a binary value which corresponds to the input voltage Ue. Afterwards, the voltage is being output. Ports (J) and (E) are used for displaying three digits of this output. When the change of the digital input occurs, it takes some time for a comparator to come to a stable mode. In our program we should consider the delay for the comparator which is equal to 30µs.

The result of the A/D conversion according to our assignment should be a transformation of the analog voltage Ue into a corresponding binary number. This binary number should be proportional to Ue