

# weighted average calculator code in C

A short code to achieve a very fast weighted filter calculator with integers, using few resources.

This filter was needed for a task that is polled at every 5. millisecond during the runtime. tUI8, -16, -32 are integer types of 8, 16 and 32 bits.

```
/* this is for a task that runs at a 5 ms frequency */
tUI8 weighted_filter(int new_sample)
{
    #define FILTER_CONST_WEIGHT          128U    /*
total weights */
    #define FILTER_CONST_WEIGHT_SAMPLE   3U     /* weight
of new sample */
    #define FILTER_CONST_SHIFT          8U     /* shift
by */
    #define FILTER_CONST_SHIFT_VAL      256U    /*
shift value */
    #define FILTER_CONST_WEIGHT_SHIFT   7U     /* shift
value of weight */

    static tUI32 sample_weighted = 0U;        /* store previous
weighted */
    static tBOOL sample_first_run = 1;        /* first run flag */
    tUI8 sample_output = 0;                   /* return value */
    tUI32 sample_tmp = 0U;                    /* temporary value,
needed for calculation */

    /* if first run, set initial values to immediately reach
input
    * method would be too slow without this
    */
    if (sample_first_run == 1)
    {
```

C

```

        sample_first_run = 0;          /* no more first runs */
        sample_output = new_sample;    /* return the input
value */
        sample_weighted = (tUI32)(new_sample ) <<
FILTER_CONST_SHIFT;    /* weighted initial value with offset
*/
    }
    else
    {
        sample_tmp = new_sample;      /* add offset temperature
to be in unsigned range */

        sample_tmp = sample_tmp >>
FILTER_CONST_WEIGHT_SHIFT; /* divide by total weights */
        sample_tmp = (sample_weighted +
(FILTER_CONST_SHIFT_VAL>>1) -1 ) >> FILTER_CONST_SHIFT;    /*
round and divide by shift | need to be kept in one row! */
        sample_output = (tUI8)sample_tmp;    /* output value
*/
    }

return (sample_output);
}

```

Created by Peter Molnar <mail@petermolnar.net>, published at 2011-08-23 10:11 UTC, last modified at 2021-10-31 15:57 UTC , to canonical URL <https://petermolnar.net/article/weighted-average-calculator-code-in-c/> , licensed under CC-BY-4.0 .