

<http://medialab.freaknet.org/martin/src/sqrt/sqrt.c>

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2010 2012 2014



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```

*      Argument is a positive integer, as is result.
*
*      I have formally proved that on exit:
*
*          2          2          2
*      res  <= x < (res+1)    and    res  + op == x
*
*      This is also nine times faster than the library routine (-lm).
*/

int
sqrt(x)
int x;
{
    /*
     *      Logically, these are unsigned. We need the sign bit to test
     *      whether (op - res - one) underflowed.
     */

    register int op, res, one;

    op = x;
    res = 0;

    /* "one" starts at the highest power of four <= than the argument. */

    one = 1 << 30; /* second-to-top bit set */
    while (one > op) one >>= 2;

    while (one != 0) {
        if (op >= res + one) {
            op = op - (res + one);
            res = res + 2 * one;
        }
        res /= 2;
        one /= 4;
    }
    return(res);
}

```