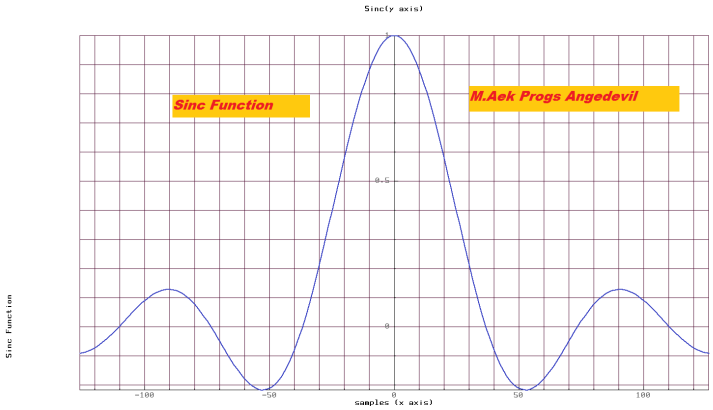
input

-3817 -5048 -3 -5879 -2399 -972 -3691 178
-579 7094 586 11539 135 3373 8554 1789
1935 -3808 1090 -7024 -4088 -7742 -6506 -7658
-9974 -17021 -7718 -16129 -10426 -14398 -7661 -16920
-9169 -16149 -9696 -11913 -9849 -1590 -11683 1852
-7977 7625 -1217 14284 8634 15493 11692 17280
10313 18542 11442 12254 8771 9257 6262 8073
-1228 5309 -4462 -780 -10366 -10139 -11022 -9863
-10378 -8584 -12185 -7305 -11467 -6863 -2488 1229
2431 8 2519 -2772 6708 1290 11580 11965
15253 22271 12659 21385 11120 19445 4815 9312
704 1310 -569 -6004 2858 -7818 2787 -9528
73 -11807 -4323 -15774 -8298 -18445 -6894 -19455
-577 -9685 1991 -8652 407 -4627 -3799 -1103
-2012 -862 5280 12203 10426 14143 11088 15708
11901 18454 5194 10349 -1303 995 -5930 -6081
-4571 -7775 -6109 -10745 -4195 -14423 -9235 -19266
-10470 -19397 -8650 -19641 -3561 -9015 -493 -2805
2758 1640 7754 3639 7702 3966 14826 13465
10795 15298 11218 15918 8356 14990 7923 10349
7838 4522 9322 7181 5170 5442 981 3238
-6352 -565 -13358 -1776 -10523 1267 -2969 2367
426 3547 6970 6570 8465 6046 8814 11489
9452 15384 13160 17030 21537 21121 25653 22154
23168 17537 16320 18405 6993 14398 3206 14555
-341 11973 -6826 2021 -11601 -3733 -13553 -7280
-11972 -9217 -8375 -7571 -3273 -3516 1336 2032
2616 11632 -3578 10666 801 13963 2634 6037
1000 -1868 556 -4561 -81 -8309 -3653 -13567
-6371 -11256 -13753 -16668 -16345 -17958 -21268 -19526
-23716 -17291 -22684 -18618 -18096 -21906 -15233 -21748
-12175 -19092 -10342 -17480 -9221 -12210 -2858 -8948

fcut = 90
len = 31
srate = 22050



Sinc = sin(x)/x

f= fcut/srate

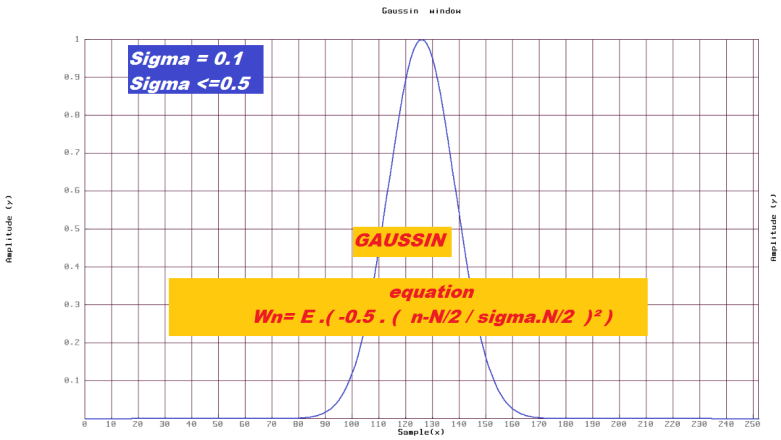
x = 2PI*f*i-(len-1)/2

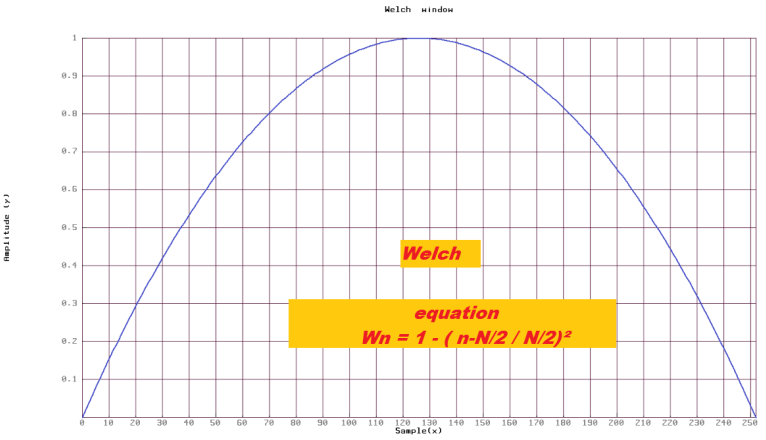
SINC:

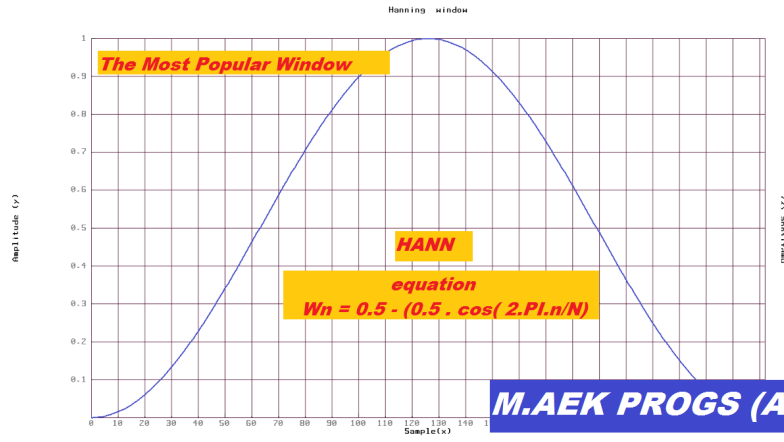
0,97552 0,97865 0,98158 0,98429 0,98679 0,98907 0,99114 0,993
0,99464 0,99606 0,99726 0,99825 0,99901 0,99956 0,99989 1
0,99989 0,99956 0,99901 0,99825 0,99726 0,99606 0,99464 0,993
0,99114 0,98907 0,98679 0,98429 0,98158 0,97865 0,97552

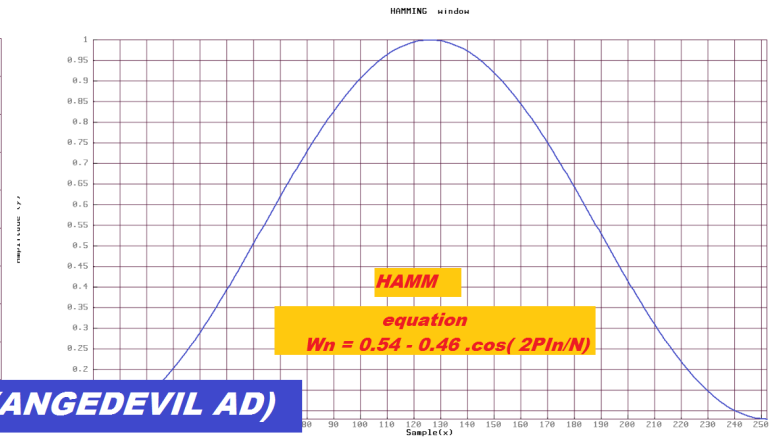
hann window = 0.5-(0.5*cos(2PI*i/(len-1)))

Hann:
0 0,01093 0,04323 0,09549 0,16543 0,25 0,34549 0,44774
0,55226 0,65451 0,75 0,83457 0,90451 0,95677 0,98907 1
0,98907 0,95677 0,90451 0,83457 0,75 0,65451 0,55226 0,44774
0,34549 0,25 0,16543 0,09549 0,04323 0,01093 0

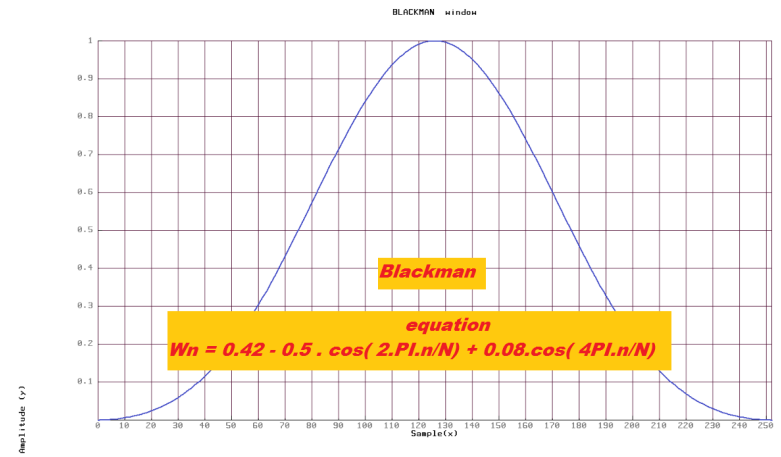


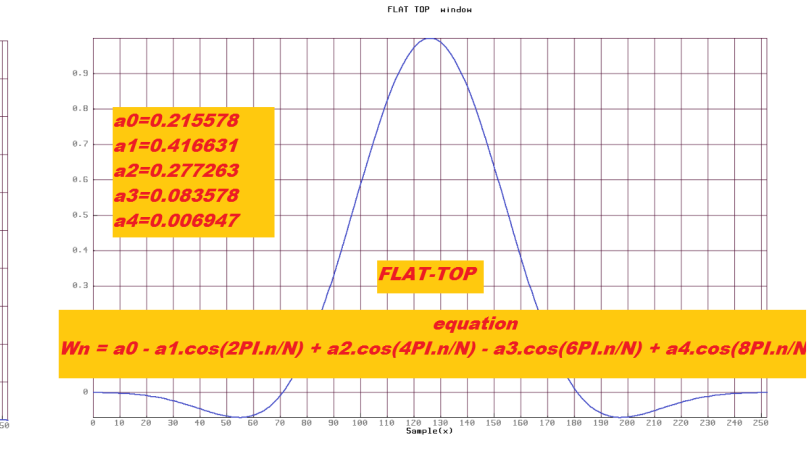




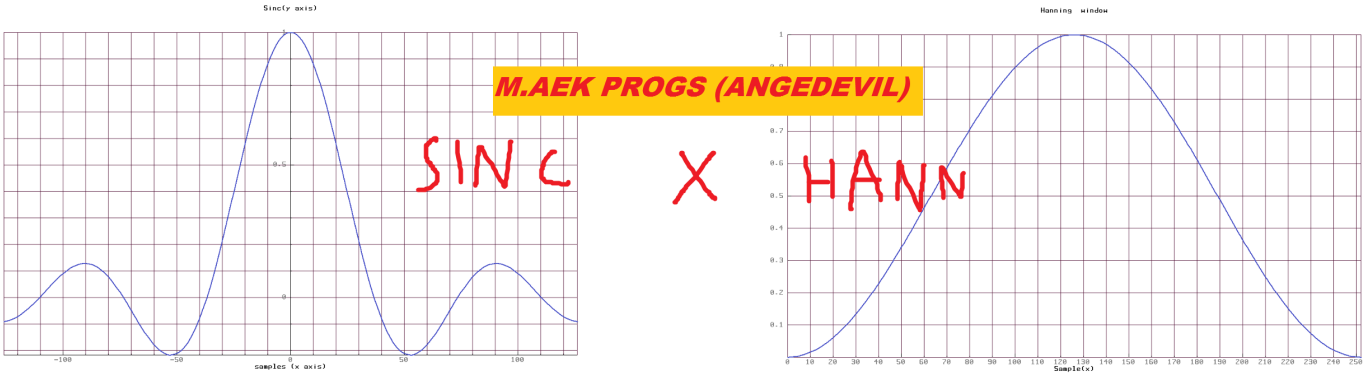


M.AEK PROGS (ANGEDEVIL AD)





Filter = Hann * SINC:
0 0,00072 0,00284 0,00629 0,01092 0,01654 0,0229 0,02974 0,03674 0,0436 0,05002 0,05572 0,06044 0,06396 0,06614 0,06688 0,06614 0,06396 0,06044 0,05572 0,05002 0,0436 0,03674 0,02974 0,0229 0,01654 0,01092 0,00629 0,00284 0,00072 0



M.AEK PROGS (ANGEDEVIL)

equation
multiply:
*FLTRn = SINCn * WINDOWn*
normaliz:
sum= FLTRn0 + FLTRNn1 + FLTRn2 ……+FLTR N

FLTRn = FLTRn / sum

M.Aek Progs Angedevil AD

Convolution:

Convolution

$$f \cdot g(n) = \sum_{m=-\infty}^{m=\infty} f(m) * g(n-m)$$

le:
input: 7 8 4 3 2 1 5 9 6 8 Filter : 4 2 3 5 7 8 4
filter len : 7
shift_nd_reverse (input) 7 0 0 0 0 0 0 0 0 0

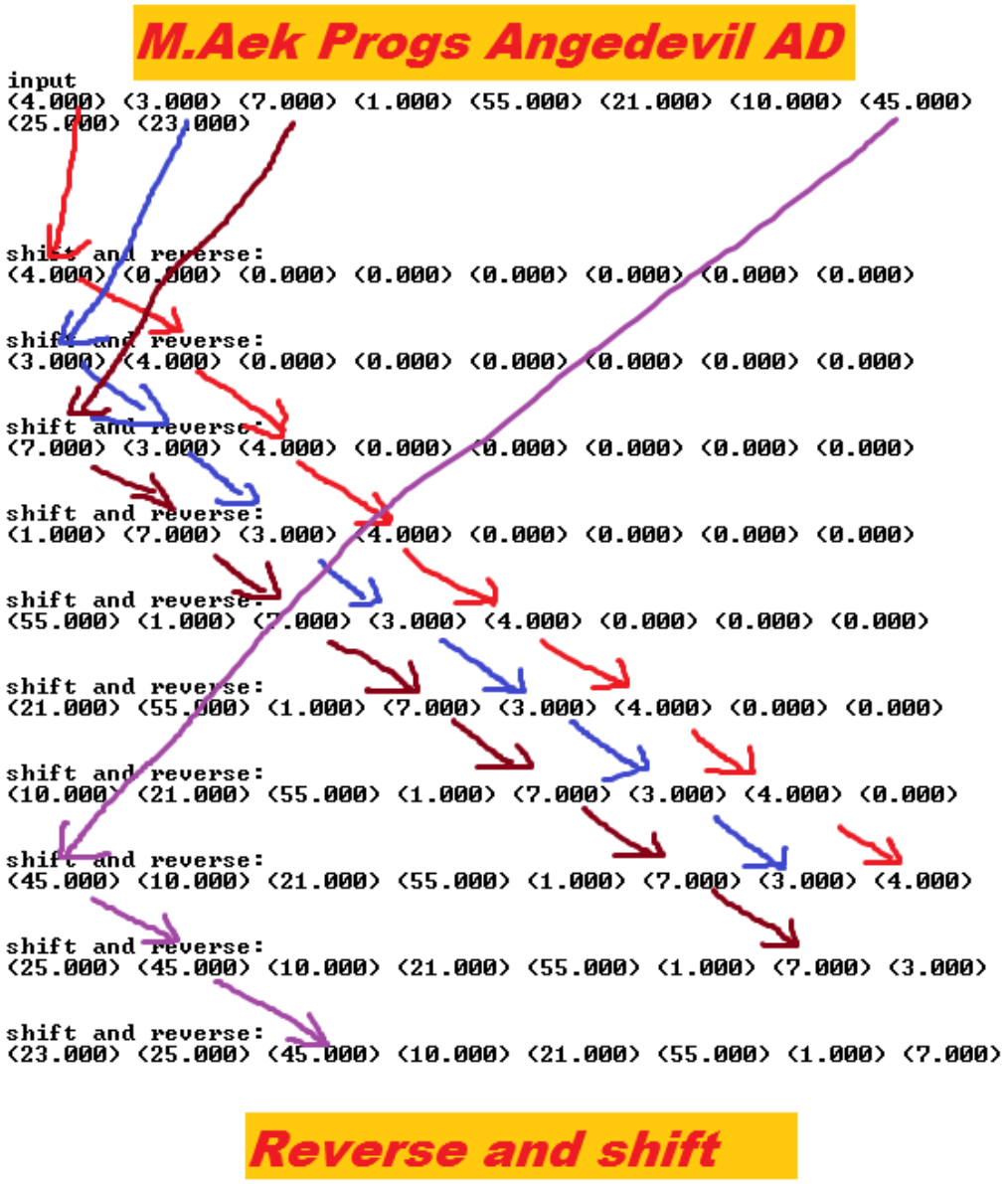
for i < filter len-1
*result = shifted_nd_reversed_input * Filter = 28 0 0 0 0 0 0 0 0 0*

output = accumulate(result) = 28+0+0+0+0+0+0+0+0+0 = 28

Shift_nd_reverse(input) 8 7 0 0 0 0 0 0 0 0
*result = shifted_nd_reversed_input * filter = 32 14 0 0 0 0 0 0 0 0*

accumulat = 32+14+0+0+0+0+0+0+0+0 = 46
continue .....
until shift_nd_reverse = 8 6 9 5 1 2 3 4 8 7
*multiply * filter = 32 12 27 25 7 16 56*
Acumulate = 32+12+27+25+7+16+56 = 175

reverse and shift



reverse and shift :0
-3817 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0
sumation:
0

reverse and shift :1
-5048 -3817 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0
sumation:
-2,72978

reverse and shift :2
-3 -5048 -3817 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0
sumation:
-14,44223

reverse and shift :3
-5879 -3 -5048 -3817 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0
sumation:
-38,32245

.
.
reverse and shift :255
-8948 -2858 -12210 -9221 -17480 -10342 -19092 -12175
-21748 -15233 -21906 -18096 -18618 -22684 -17291 -23716
-19526 -21268 -17958 -16345 -16668 -13753 -11256 -6371
-13567 -3653 -8309 -81 -4561 556 -1868
sumation:
-17288,35303

output (filtred block):
0 -2 -14 -38 -77 -136 -215 -313
-430 -560 -692 -817 -918 -985 -1010 -983
-900 -759 -569 -340 -86 173 419 629
784 864 845 711 450 54 -477 -1135
-1901 -2758 -3681 -4643 -5615 -6568 -7465 -8277
-8980 -9554 -9982 -10251 -10342 -10241 -9945 -9449
-8751 -7860 -6790 -5557 -4189 -2721 -1192 354
1881 3344 4700 5908 6932 7733 8280 8552
8542 8253 7699 6907 5904 4731 3433 2063
682 -652 -1891 -2993 -3928 -4673 -5209 -5525
-5610 -5464 -5081 -4470 -3646 -2631 -1458 -167
1195 2575 3918 5174 6298 7255 8013 8551
8854 8916 8740 8337 7722 6912 5924 4780
3510 2152 759 -617 -1927 -3130 -4193 -5096
-5830 -6391 -6781 -7004 -7059 -6946 -6661 -6206
-5582 -4798 -3861 -2792 -1622 -394 845 2045
3152 4123 4920 5515 5890 6036 5951 5637
5093 4328 3359 2214 926 -460 -1889 -3303
-4641 -5848 -6881 -7704 -8292 -8627 -8708 -8537
-8122 -7481 -6635 -5607 -4423 -3113 -1709 -247
1229 2681 4066 5343 6483 7462 8266 8887
9321 9569 9636 9524 9237 8786 8186 7461
6639 5753 4833 3922 3058 2278 1606 1064
672 442 385 504 800 1271 1914 2722
3685 4783 5987 7260 8564 9855 11091 12232
13247 14112 14809 15318 15622 15702 15542 15136
14483 13589 12469 11148 9662 8056 6381 4693
3051 1508 121 -1071 -2044 -2780 -3271 -3516
-3528 -3325 -2943 -2417 -1790 -1104 -410 242
804 1234 1502 1586 1472 1153 633 -79
-966 -2009 -3180 -4449 -5786 -7158 -8536 -9891
-11201 -12439 -13579 -14601 -15492 -16244 -16846 -17288