

W2FTCFTS

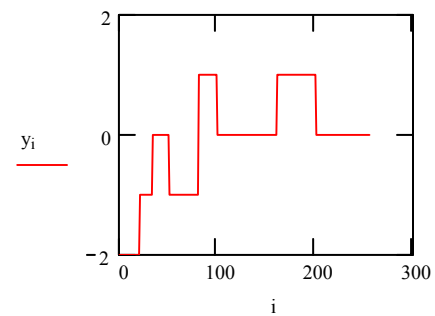
Example of real fft and complex cfft on a real object function.

1. The real FT fft

The Object $i := 0, 1 \dots 255$

$A_1 := 33$ $A_3 := 80$ $A_4 := 50$ $A_5 := 20$ $A_6 := 99$ $A_7 := 160$ $A_8 := 200$

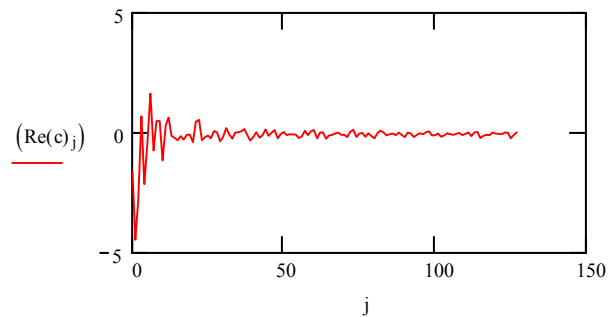
$$y_i := \sum_{n=1}^3 (-\Phi(A_n - i)) + \sum_{n=4}^8 [\Phi(A_n - i) \cdot (-1)^n]$$



The real Fourier Transformation

$c := \text{fft}(y)$ $Nc := \text{last}(c)$ $Nc = 128$

$j := 0 \dots Nc - 1$



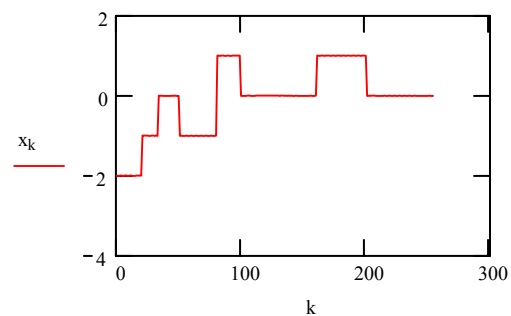
The inverse Fourier Transformation.

$x := \text{ifft}(c)$

$Nx := \text{last}(x)$ $Nx = 255$

$k := 0 \dots Nx - 1$

We can not use $x = \text{fft}(c)$ we get the "Error message" c must be real.

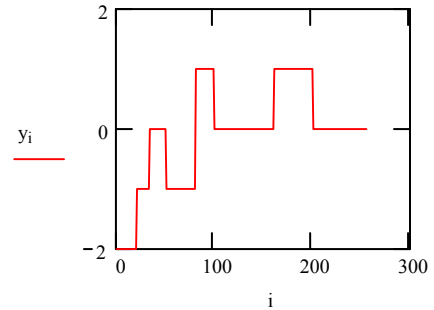


2. The complex Fourier Transformation.

The Object $i := 0, 1 \dots 255$

$A_1 := 33$ $A_2 := 80$ $A_3 := 80$ $A_4 := 50$ $A_5 := 20$ $A_6 := 99$ $A_7 := 160$ $A_8 := 200$

$$y_i := \sum_{n=1}^3 \left(-\Phi(A_n - i) \right) + \sum_{n=4}^8 \left[\Phi(A_n - i) \cdot (-1)^n \right]$$

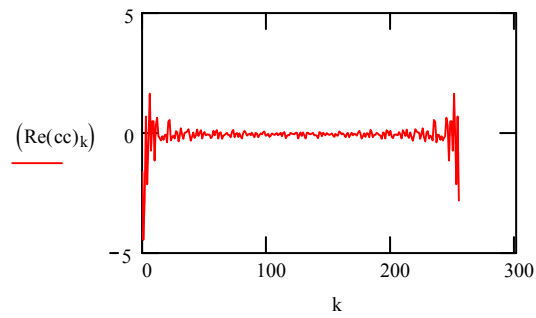


The complex Fourier Transformation.

$cc := \text{cfft}(y)$

$N_{cc} := \text{last}(cc)$ $N_{cc} = 255$

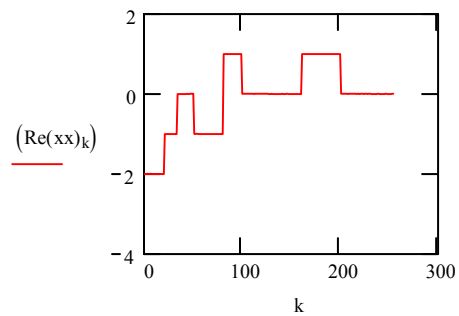
$k := 0 \dots N_{cc} - 1$



The inverse Fourier Transformation.

$xx := \text{icfft}(cc)$ $N_{xx} := \text{last}(xx)$

$N_{xx} = 255$ $k := 0 \dots N_{xx} - 1$



3. Application of cfft the second time, instead of the invers icfft

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xxx := cfft(cc)
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Nxxx := last(xxx)    Nxxx = 255
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f := 0..Nxxx - 1
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