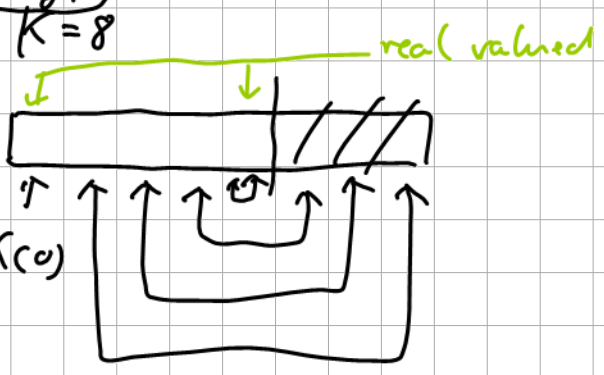
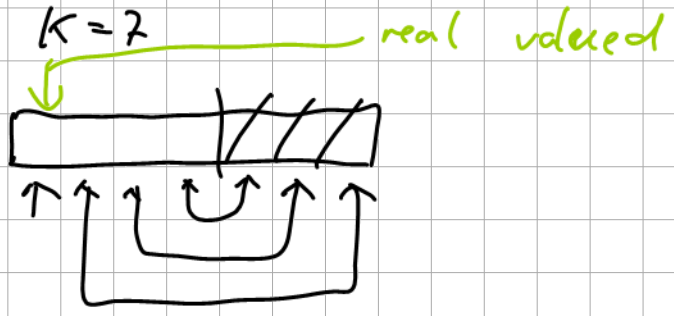
C2 27)





remaining part $\tilde{K} = \frac{K}{2} + 1$

remaining part $\tilde{K} = \left\lfloor \frac{K}{2} \right\rfloor + 1$

$\Uparrow$ rounding down

$\lceil$ rounding up

remaining part $\tilde{K} = \lfloor \frac{K}{2} \rfloor + 1$

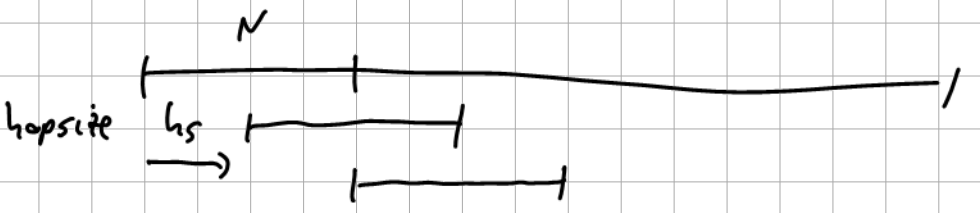
C2 28 T1 3s of audio $r = 16\ kHz$

Df Seffa than 10 Hz

the resolution Seffa than 50 spectra per second

overlap ~~50%~~ 75%

K = ? , N = ? , zero padding = ? , memory consumption

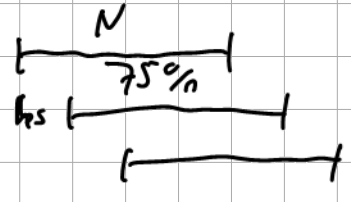


50 Blocks per second $\Leftrightarrow$ 50 spectra per second

$\Rightarrow$ $hs = \frac{1s}{50} = 20\ ms$ $\hat{=}$ 320 samples

$r = 16000\ Hz$

$1s \hat{=} 16000$ samples

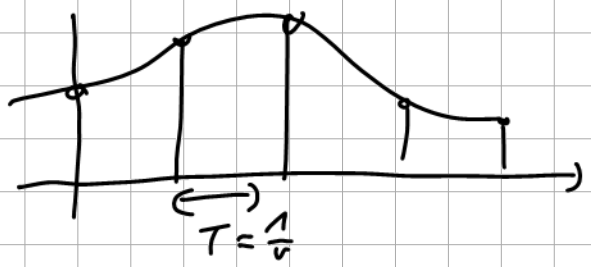


$N = 80\ ms$ $\hat{=}$ 1280 samples

$1ms \hat{=} 16$ samples

$$\Delta f = \frac{1}{K \cdot T} \qquad T = \frac{1}{f}$$

$$= \frac{r}{K}$$

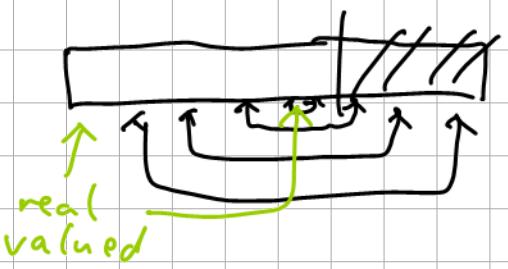


$$\Delta f \leq \frac{r}{K} \Rightarrow K \leq \frac{r}{\Delta f} = \frac{16000\ Hz}{10\ Hz} = 1600$$

zero padding: $N < K \Rightarrow$ yes

$K = 1600$ remaining part for each spectra:

801



2 real values

799 complex values

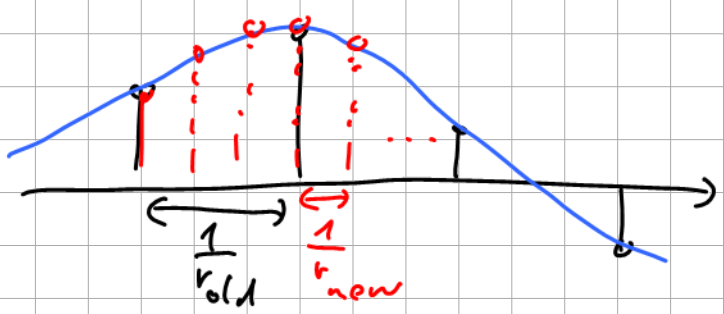
$$3\,\cancel{s} \cdot 50\ \frac{\text{spectra}}{\cancel{s}} \cdot Y\ \frac{\text{Bytes}}{\cancel{\text{spectra}}}$$

with $Y = 2 \cdot 4\ \text{Bytes} + 799 \cdot 8\ \text{Bytes}$

$$3 \cdot 50 \cdot (2 \cdot 4 + 799 \cdot 8)\ \text{Bytes} = 960000\ \text{Bytes}$$

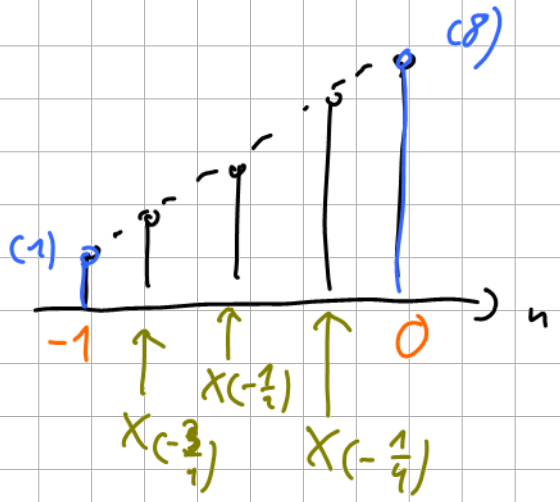
$$\left(\frac{3 \cdot 16000 - 1280}{320} + 1\right) \cdot (2 \cdot 4 + 799 \cdot 8) = 934400\ \text{Bytes}$$

C2 J5 T2



Envelope ideally evaluated by sinc(...)

$$r_{new} = 3 \cdot r_{old}$$



envelope by linear interpolation

$r_{new} = 4 \cdot r_{old}$

input

$x(n) = m \cdot n + s$

$m = \frac{8-1}{0-(-1)} = 7$

$1 = 7 \cdot (-1) + s \Rightarrow s = 8$

$x(-\frac{3}{4}) = 7 \cdot (-\frac{3}{4}) + 8 = \frac{11}{4}$

C2] 2 T4 $N=5$ $r = 1000$ $f_c = 250\ Hz$

$\downarrow$

$-2 = n$
$-1 = m$
$0 = n$

$$h(n) = \frac{\sin(2\pi f_c \frac{n}{r})}{2\pi f_c \cdot \frac{n}{r}} \cdot \frac{1}{2}\left(1 + \cos(2\pi n / N)\right)$$