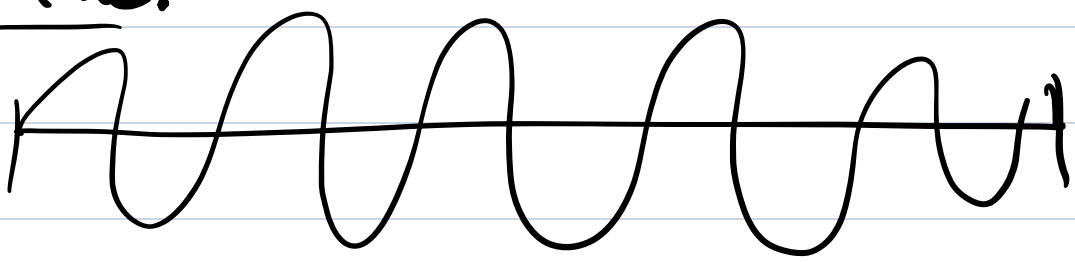
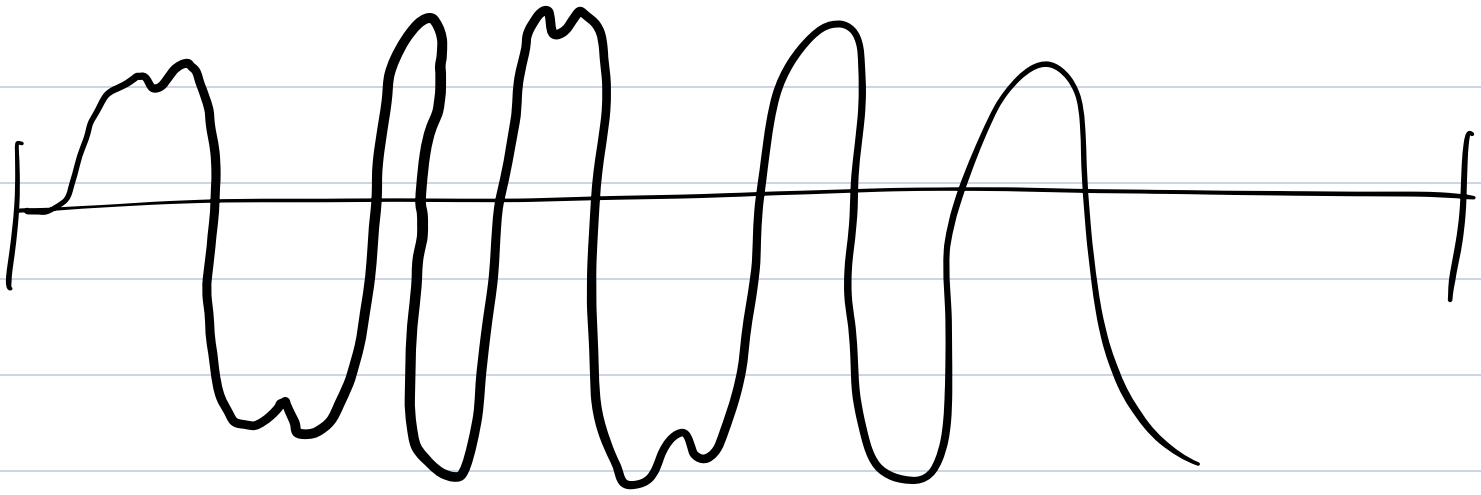
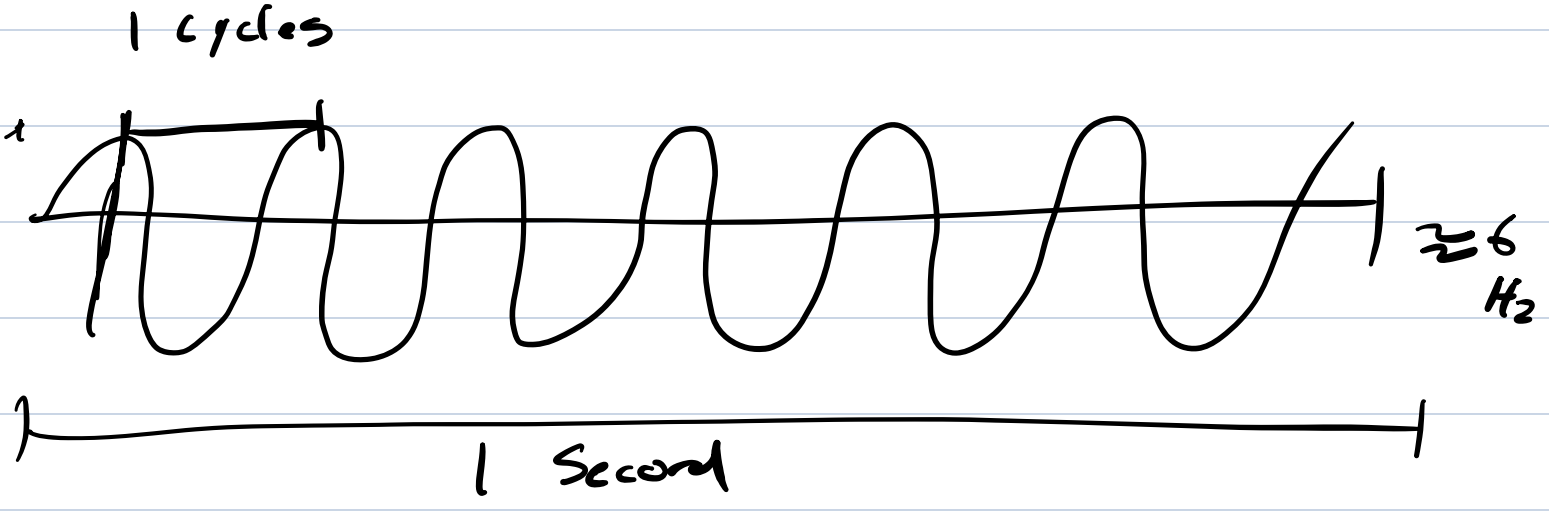
Frequency - the number of times a periodic function repeats the sequence of values during a unit of time.







Cycles per second = Hertz (Hz)

- The lower the frequency the fewer oscillations / cycles

- The Higher the frequency the higher number of oscillations.

< 200 Hz → Counts as low frequency

> 2,000 Hz → High frequency

5G networks ~ 5 GHz

2.5 – 5.26 GHz

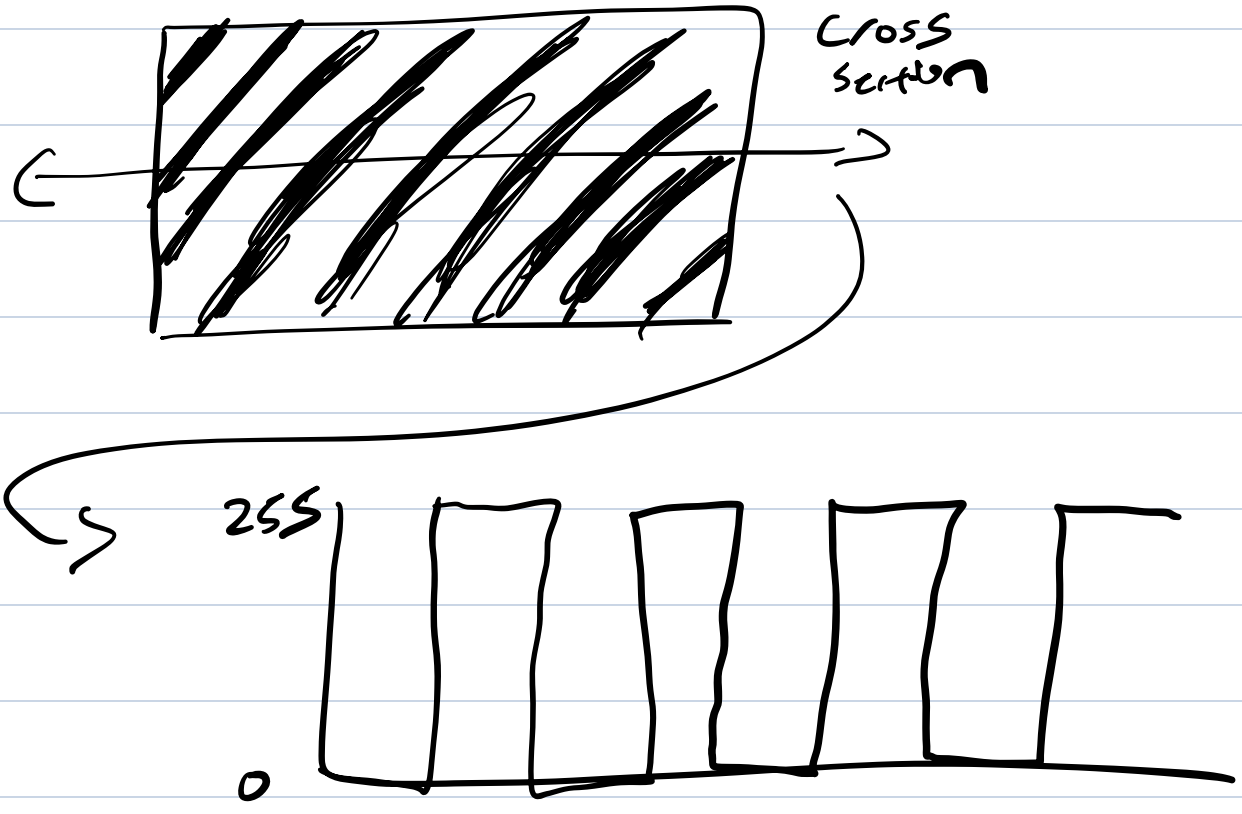
5G towers → 1-3 miles

Ham radio – 30 - 300 MHz

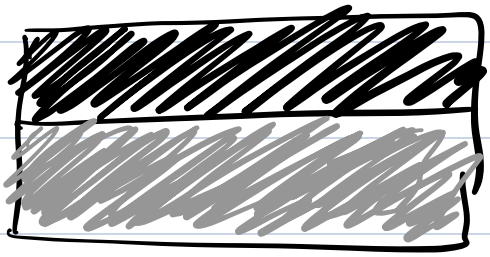
- Powerful base station + hi-gain antenna (4,000 → 6,400 km) miles

- Frequency in an image - is the rate of change of intensity of values.

- High-frequency image — an image that changes between extreme pixel values

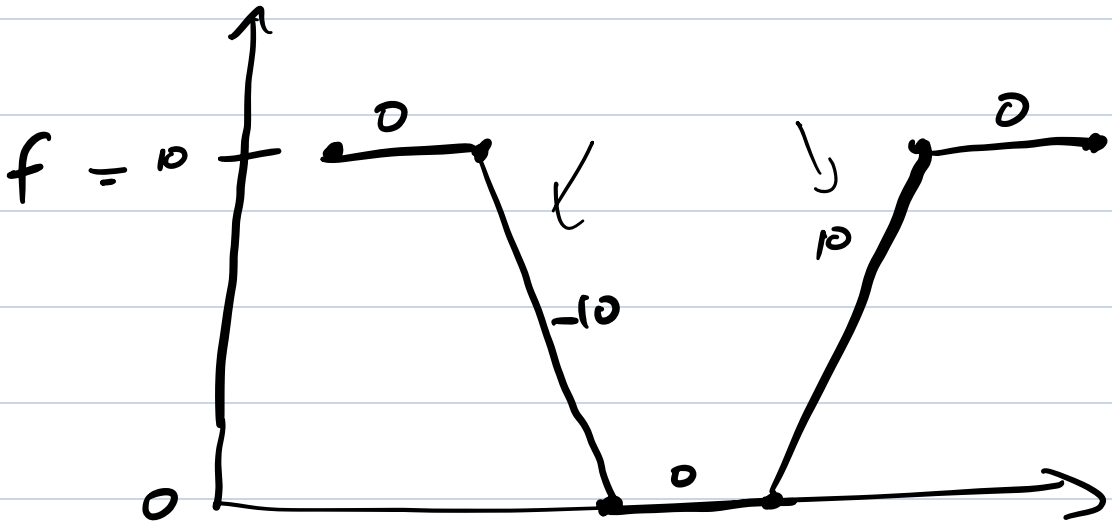


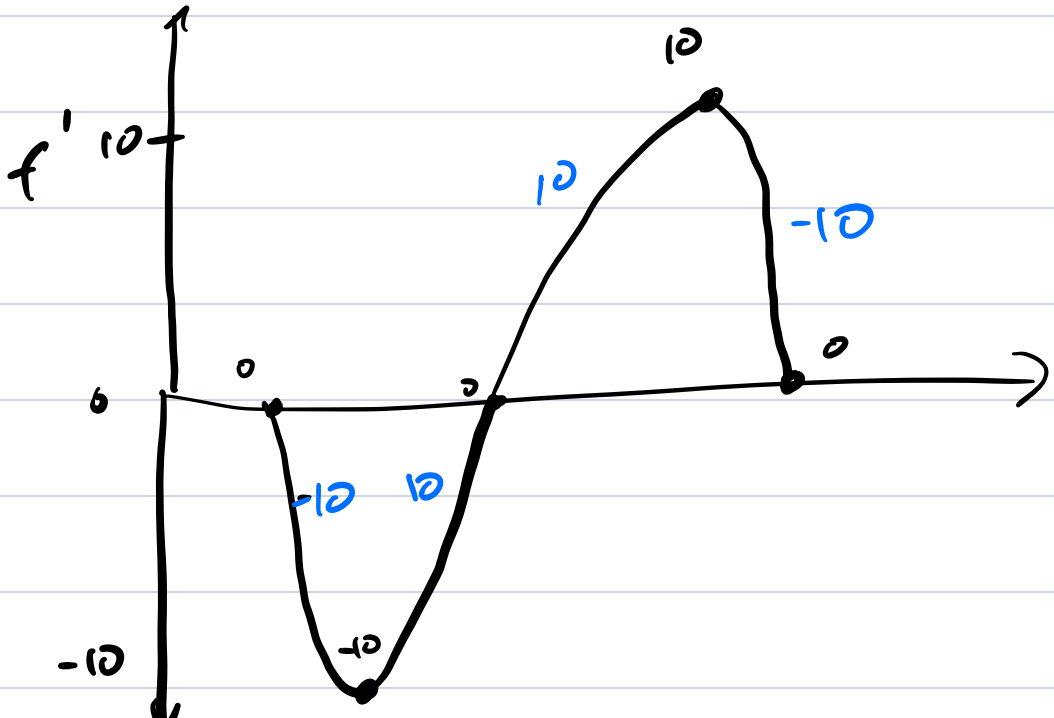
low-frequency - are images that have relative uniform brightness.

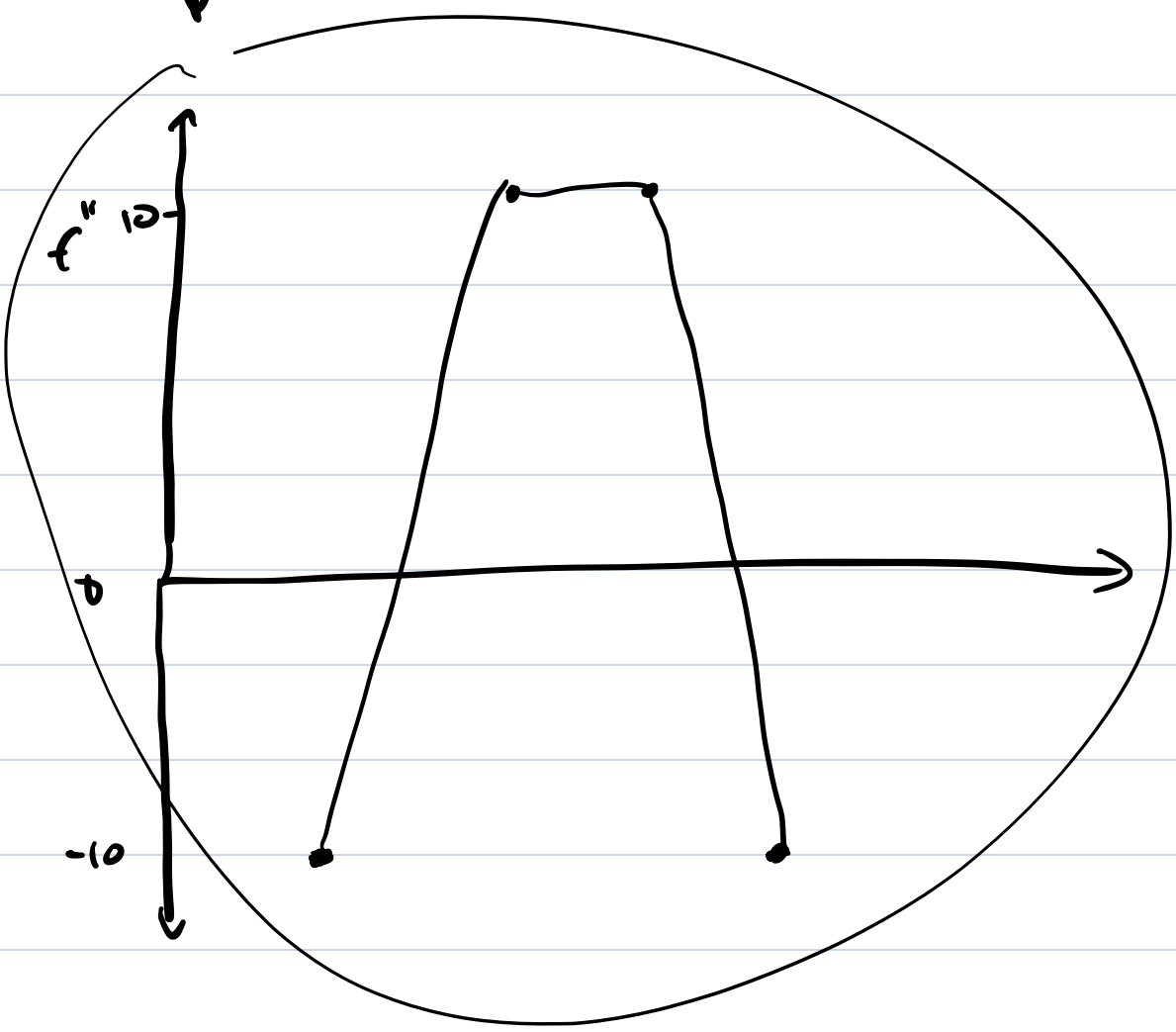


High pass filter

(orginal image − low pass filter) +127 = 2nd derivative?







$f = (10, 10, 0, 0, 10, 10)$

low pass = $[1, 0, 1]$

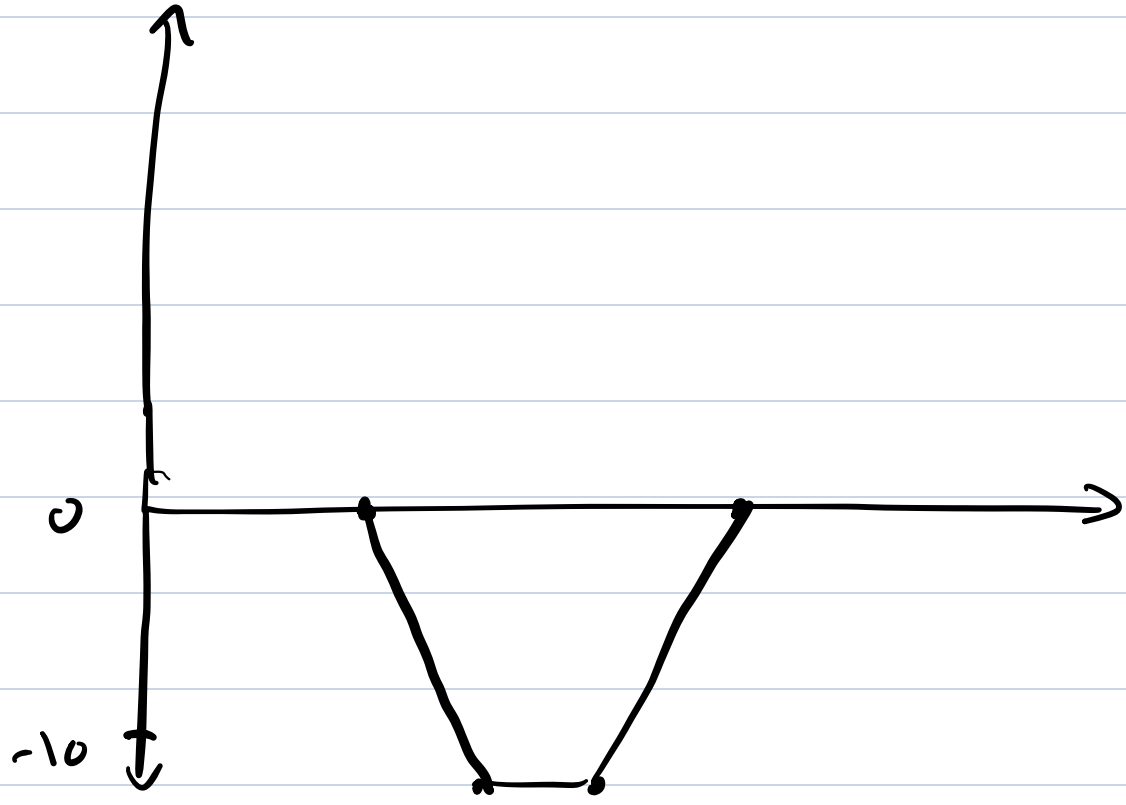
original image: 10 10 0 0 10 10

low pass results = $[X, 10, 10, 10, 10, X]$

$[X, 0, -10, -10, 0, X]$

original

- low pass results



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most extreem

[255, 0, 0]

[1, 0, 1] $\frac{1}{2}$

~ 128

[0, 255, 255

[1, 0, 1] $\frac{1}{2}$

128

orginal image

$0 - 128 = -128$

$-128 + 128$

0

orginal

$255 - 128 = 127$

$127 + 128$

255

$0 \longleftrightarrow 255$