**Fourier Transform**

A Fourier transform (FT) is**a mathematical transform that decomposes functions into frequency components, which are represented by the output of the transform as a function of frequency.**

**Fast Fourier Transform**

A divide and conquer Technique to scan even verse odd elements and implement the formula to achieve BIGO(NLOGN) then It was shifted to collect the high frequencies from the edges to the DC then a log transform was implemented to impower the week parts.

**Text, letter

Description automatically generated**

Firstly the image is been flattened by image.flatten() to have just 1d signal to get the Fourier transform applied to it. Then the recursive fast fourier transform is applied bye doing decrease and conquer technique to it by calling the recursion twice each for even and odd iterations. With a base case length of <= 2 so another discrete function is called to perform the operation to the remaining size of the array 2 or 1 cells. Then the imaginary exponential is calculated according to the formula and the even part plus the odd part multiplied to the exponential were concatenated and returned to represent the fourier transform. Then we do reshape to the image back to it is original shape

