multifractals - fractals with varying degrees of roughness. For each value of roughness, compute the dimension of the part of the fractal having that roughness.

α measures roughness; for each value of α, $f(\alpha)$ is the dimension of the part of the fractal with that α.

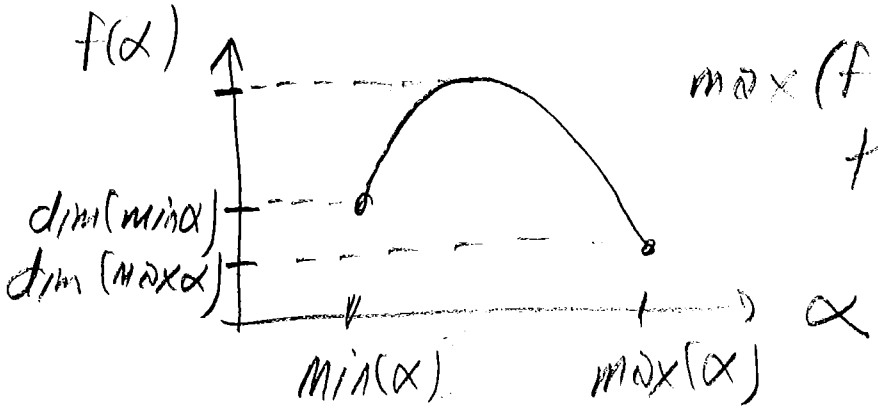
Using IFS with different probabilities,

$$\alpha = \frac{\log(\text{prob})}{\log(\text{box size})}$$

If $r_1 = r_2 = r_3 = r_4$ for $\{T_1, T_2, T_3, T_4\}$,

then $$\min(\alpha) = \frac{\log(\max p_i)}{\log(r_i)}$$

$$\max(\alpha) = \frac{\log(\min p_i)}{\log(r_i)}$$



$\max(f(\alpha)) =$ dim of the IFS $= \frac{\log 4}{\log(1/r)}$