1) Zgral weight: Wi= h: 2) Inverse soldility Weighting, Assets are weighted inversely proportional to their vol. Lorer volatility axets receive a higher neight.  $w_i = \frac{\sqrt{6}i}{\Sigma_{i} = 1} \frac{1}{6}i$ 3> Inverse Vacance Weighting: Wi. 1/6; 4> Hierarchical Risk Parity (HRP) Weighting: Improve traditional will parity approaches by onsideing hierarchical structure in and returns. (Vietal for assets with Guylex swelation structurer. Steps: O Compute Vistance Matrix D=, 2x(1-5), I = Correlation Matrix; @ Hierarchizal Clustering: (Wand's method, single linkage, aug. linkage, etc.) -> result is tree-like structure (dendrogram) shows how every asset is linked to each other. (1) Chasi- Diagonalization: Order courts from hierarchical zlustering -> zhon to diagonal matrix; @ Perusine Ricoction: Beausinely split the denogram: start of entire set of cosets, then successively divide set into smaller subjects. Each time of split, albeate the visit equally b/2 2 resulting subsets. Continue bisection until each asset forms its own subject; (5) All-rading weights: Using 27 or 37 aim: asset (sweet of asset) that are less virge and less smelated with the vest of part. receive hisher weights, and vice versa. 57 Zand Pisk Entibetion (ZRZ) Weighting: Zouh asset contributes equally to the portf. 's total risk. Min [ Sin ( W. PZ: - h I'm PZ; PZ; Pick contribution

of each asset is (depending on asset weight and marginal contribution to putif. visle).

4 6) Maximum Viversication weighting: Maximize Piversification Ratio = weighted arg. vol. Max ( Zi=1 wi 6i / [WT & w, New Z: Evariance matrix, w: weight matrix). 7> Maximum Decrelation Weighting: Minimizing anelogion blu assets in the portf. Min (uT I am w), where I am is the anelation motion. 82 Maximum Sharpe Ratio weighting. Socks a port. with highest Shape Rotio. Max (wT(H-VF) /WTIw), H: vector of expected vatures. Vf: visk-free vote. P. Min-Voriance given Taget Return (Taget Whathir). Optimize for the highest veture for a given level of risk on the lowest vish for a given level of return. - Touget Return: Min (w I w) s.E. w \u = touget veturn, I w = 1. - Target volatility. Max (v) s.t. TwIIw = target vol., Iw: = 1 Command of Shift of 5