A concise function such that given a matrix M as input

it will return **(Note: To check if k <0 $\lambda_i = 0$ should not be considered)**

i) the sum of the n absolute values of the eigenvalues or in genral i look at $\sum_{i=1}^{n} |\lambda_i|^k$

ii)sum of the positive eigenvalues or in general $\sum_{i=1}^{n^+} (\lambda_i^+)^k$

iii) sum of the absolute values of the negative eigenvalues $\sum_{i=1}^{n^-} |\lambda_i^-|^k$

iv) minimum eigen value $\min_i\{\lambda_i\}$

v) Maximum eigen value $\max_i\{\lambda_i\}$

vi) Maximum of the absolute of the eigen values $\max_i\{|\lambda_i|\}$

vii) Maximum eigen value -Minimum eigen value