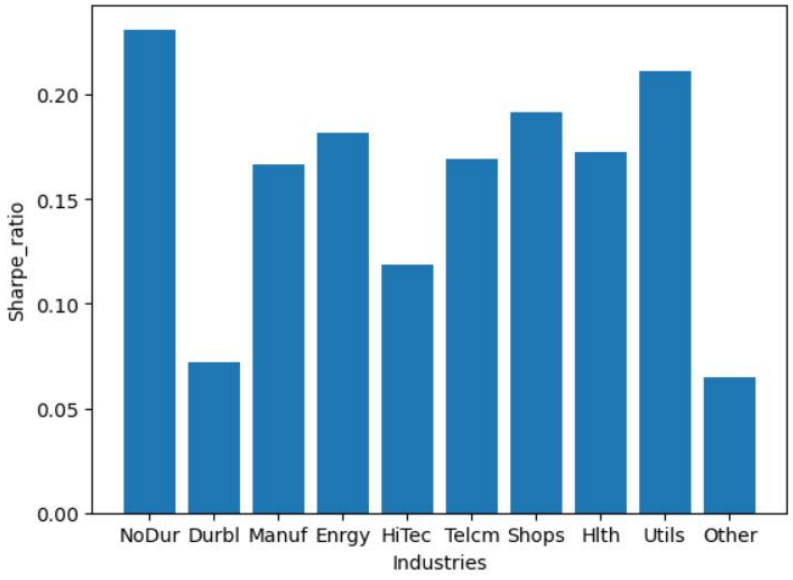
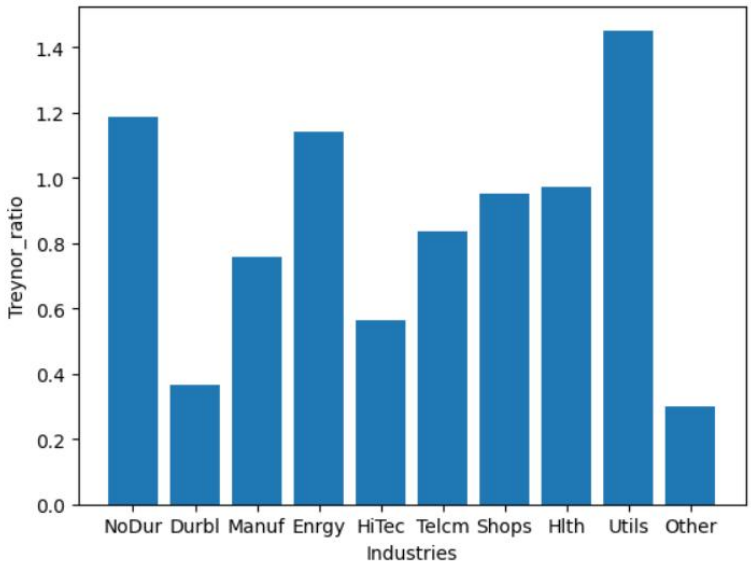
Q1.Create a table showing the performance metrics for the ten industry portfolios.

	Sharpe_Ratio	Treynor_Ratio	Sortino_Ratio	Jensen's Alpha	Three-Factor α
NoDur	0.231099	1.186372	0.350804	0.369717	0.386704
Durbl	0.072356	0.367463	0.111967	-0.417903	-0.474342
Manuf	0.166616	0.758251	0.241260	0.160494	0.153285
Enrgy	0.181708	1.143330	0.273612	0.504485	0.523007
HiTec	0.118552	0.564295	0.170620	-0.064024	-0.065979
Telcm	0.169064	0.836363	0.244940	0.194348	0.200724
Shops	0.191753	0.951258	0.293032	0.274093	0.255941
Hlth	0.172529	0.971435	0.270294	0.236968	0.257472
Utils	0.210948	1.452334	0.290044	0.446523	0.474411
Other	0.064693	0.299781	0.087351	-0.387508	-0.404412

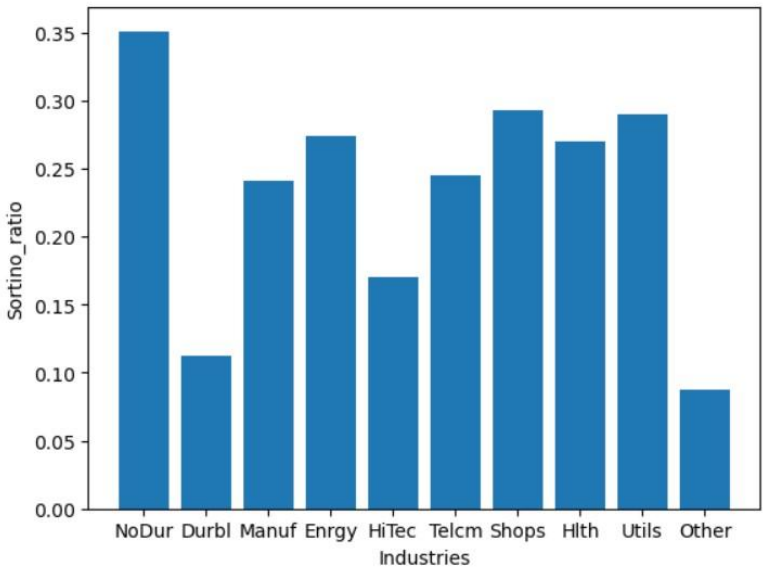
Q2.Plot your results as a bar chart for each performance metric.
Sharpe Ratio:



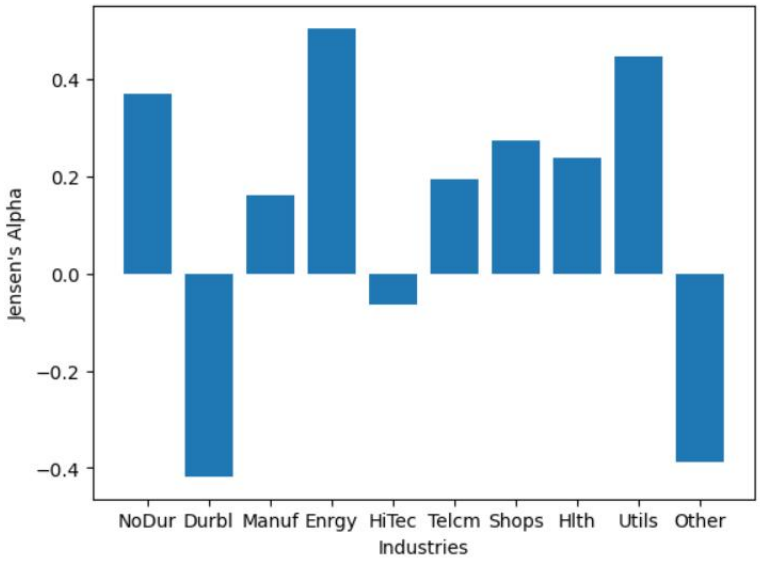
Treynor Ratio(based on CAPM β）：



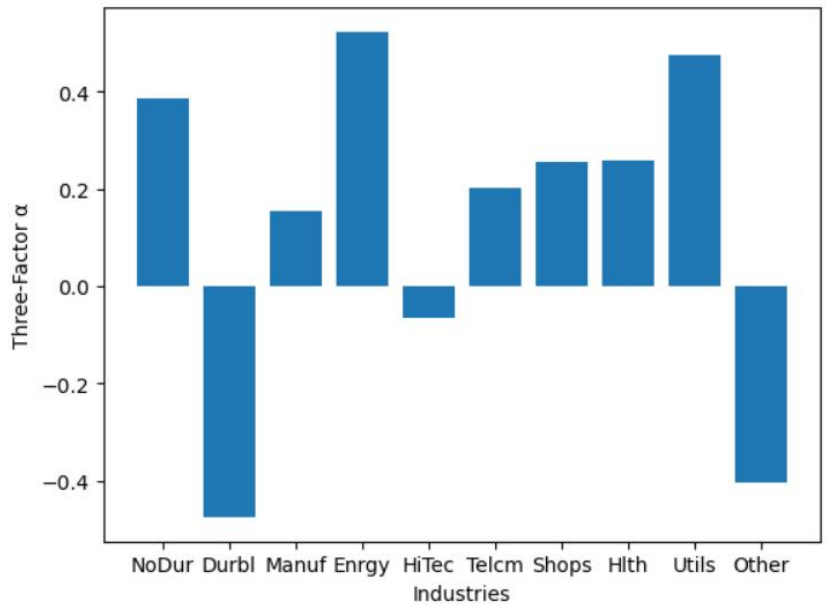
Sortino ratio (using risk-free rate as target)：



Jensen’s Alpha:



Three Factor alpha:



Q3.Briefly explain the economic significance of each of the three performance ratios (but not α's).

Sharpe Ratio: Sharpe ratio is risk premium per unit of standard deviation,its economic significance lies in helping investors evaluate the trade-off between risk and return, enabling them to make more informed investment decisions.A high Sharpe Ratio generally indicates that a portfolio or asset has earned a higher return per unit of risk. We can make reasonable investment decisions based on Sharpe ratio and investors' own risk preference.

Treynor Ratio: Treynor ratio is risk premium per unit of market risk.Investors can use it to evaluate the market risk exposure of their portfolios and determine whether adjustments are needed to achieve a more favorable risk-return trade-off.However,it will fail to account for other types of systematic risk besides market risk,so it should be used in conjunction with other performance metrics and analyses to make well-informed investment decisions.

Sortino Ratio: Sortino ratio is expected deviation from target (or benchmark) return, per unit of below-target semi-deviation.It is an improvement upon the Sharpe Ratio, as it focuses specifically on downside risk, which includes only the volatility or risk associated with negative returns.