

```
import numpy as np
import pandas as pd
X = pd.read_csv('mtcars.csv')
y = X['carb']
X = X.drop(['carb', 'model'], axis=1)
X = (X - X.mean()) / X.std()
covariance_matrix = np.cov(X, rowvar=False)
eigenvalues, eigenvectors = np.linalg.eig(covariance_matrix)
sorted_indices = np.argsort(eigenvalues)[::-1]
eigenvalues = eigenvalues[sorted_indices]
eigenvectors = eigenvectors[:, sorted_indices]
explained_variance_ratio = eigenvalues / np.sum(eigenvalues)
feature_rank = np.argsort(explained_variance_ratio)[::-1]
variance = np.var(X, axis=0)
print("Rank of features:")
for i,var in enumerate(variance):
    print(f"Feature {i+1}:variance {var:.4f}")
```

Output:

```
Rank of features:
Feature 1:variance 0.9688
Feature 2:variance 0.9688
Feature 3:variance 0.9688
Feature 4:variance 0.9688
Feature 5:variance 0.9688
Feature 6:variance 0.9688
Feature 7:variance 0.9687
Feature 8:variance 0.9687
Feature 9:variance 0.9688
Feature 10:variance 0.9687
```