In [41]: `import numpy as np`

Question 1

Robust Scaler is a feature scaling technique used in machine learning to standardize numerical input variables, especially when dealing with datasets that contain outliers. It uses the median and IQR to scale the data, making it less sensitive to extreme values compared to other scaling methods like StandardScaler.

Question 2

In [42]:
```
X = [[ 1., -2.,  2.],

    [ -2.,  1.,  3.],

    [ 4.,  1., -2.]]
X = np.array(X)
```

In [43]:
```
from sklearn.preprocessing import RobustScaler
r_scaler = RobustScaler()
scaled_X = r_scaler.fit_transform(X)
scaled_X
```

Out[43]:
```
array([[ 0. , -2. ,  0. ],
       [-1. ,  0. ,  0.4],
       [ 1. ,  0. , -1.6]])
```

Question 3

In [44]:
```
X = [[ 1., -1.,  2.],

    [ 2.,  0.,  0.],

    [ 0.,  1., -1.]]
X = np.array(X)
```

In [45]:
```
from sklearn.preprocessing import StandardScaler
s_scaler = StandardScaler()
scaled_X = s_scaler.fit_transform(X)
scaled_X
```

Out[45]:
```
array([[ 0.        , -1.22474487,  1.33630621],
       [ 1.22474487,  0.        , -0.26726124],
       [-1.22474487,  1.22474487, -1.06904497]])
```

Question 4

```
In [46]: from sklearn.preprocessing import MaxAbsScaler
         m_scaler = MaxAbsScaler()
         scaled_X = m_scaler.fit_transform(X)
         scaled_X
```

```
Out[46]: array([[ 0.5, -1. ,  1. ],
                [ 1. ,  0. ,  0. ],
                [ 0. ,  1. , -0.5]])
```

Question 5

```
In [47]: from sklearn.preprocessing import OneHotEncoder
         arr = np.array([['Male', 1], ['Female', 3], ['Female', 2]])
         enc = OneHotEncoder()
         encoded_arr = enc.fit_transform(arr)
         encoded_arr.toarray()
```

```
Out[47]: array([[0., 1., 1., 0., 0.],
                [1., 0., 0., 0., 1.],
                [1., 0., 0., 1., 0.]])
```

Question 6

```
In [48]: from sklearn.preprocessing import MultiLabelBinarizer

         mlb = MultiLabelBinarizer()
         encoded = mlb.fit_transform([{'sci-fi', 'thriller'}, {'comedy'}])
         print(mlb.classes_)
         print(encoded)
```

```
['comedy' 'sci-fi' 'thriller']
[[0 1 1]
 [1 0 0]]
```