In the first part of this assignment, we will consider school ground maps representing rooms and their layout in a rectangular grid, and analyze the sequences of cardinal directions (north, south, east, west) that a person needs to walk to reach from one room to another.

Feature Transformations

Consider the data contained in the text file assignment3.zip, and the file ./data/ex1.txt contains the data.

1) Scaling

The data contains separate training and test data as follows:

```
data = load('ex1.dat');
X = data(:,1:2); y = data(:,3);
```

Consider the regression setting $Y = [X, X_2] + \epsilon$. Let

$$\Gamma = \begin{bmatrix} \gamma_1 & 0 \\ 0 & \gamma_2 \end{bmatrix}$$

be a diagonal matrix with non-negative entries, and let $\Gamma^{-1} = \begin{bmatrix} \gamma_1^{-1} & 0 \\ 0 & \gamma_2^{-1} \end{bmatrix}$ be its inverse.

$$\Gamma^{-1} = \begin{bmatrix} \gamma_1^{-1} & 0 \\ 0 & \gamma_2^{-1} \end{bmatrix}, \quad \Gamma = \begin{bmatrix} \gamma_1 & 0 \\ 0 & \gamma_2 \end{bmatrix}$$

In this phase, γ_1 and γ_2 $\in \{1, 2, 3\}$. Use the sequentially through the stages and the Ridge-Lasso-Elastic-Net-Lasso-Ridge-Lasso-Elastic-Net-Lasso-Ridge-Lasso-Elastic-Net-Lasso-