### **Task 1: Feature Selection**

In this task, you will explore the given features and select the most relevant ones for predicting the target variable (median\_value\_of\_home(1000s\_dollars)). Use the following steps to complete this task:

1. Load the dataset and split it into train and test sets (70% for training and 30% for testing).
2. Use correlation matrix and scatter plots to visualise the relationship between each feature and the target variable.
3. Based on your observations, select the top 5 most relevant features and create a new dataset with only these features.
4. Split the new dataset into train and test sets.

### **Task 2: Linear Regression**

In this task, you will apply Linear Regression on the selected features and evaluate its performance on the test dataset. Use the following steps to complete this task:

1. Train a Linear Regression model on the train dataset.
2. Evaluate the performance of the model on the train and test datasets using Mean Squared Error (MSE) and R-squared score.
3. Plot the predicted values vs the actual values for the test dataset to visualize the performance of the model.

### **Task 3: Regularization**

In this task, you will apply L1 and L2 regularization to prevent overfitting and improve the performance of the Linear Regression model. Use the following steps to complete this task:

1. Train a Ridge Regression model with L2 regularization on the train dataset and evaluate its performance on the test dataset using MSE and R-squared score.
2. Train a Lasso Regression model with L1 regularization on the train dataset and evaluate its performance on the test dataset using MSE and R-squared score.
3. Compare the performance of the Ridge and Lasso Regression models with the Linear Regression model.

### **Task 4: Grid Search**

In this task, you will use GridSearchCV to find the best value of lambda for both Ridge and Lasso Regression models. Use the following steps to complete this task:

1. Define a range of values for lambda.
2. Use GridSearchCV to find the best value of lambda for Ridge and Lasso Regression models.
3. Train the Ridge and Lasso Regression models with the best values of lambda and evaluate their performance on the test dataset using MSE and R-squared score.
4. Compare the performance of the Ridge and Lasso Regression models with the Linear Regression model.

### **Submission**

Submit your solution as a Jupyter notebook including code, comments, and visualisations. Make sure to include all the necessary libraries and dependencies. Also, provide explanations for each step and conclusion.