MACHINE LEARNING

1. A) Least Square Error
2. A) Linear regression is sensitive to outliers
3. B) Negative
4. B) Correlation
5. A) High bias and high variance
6. B) Predictive model
7. D) Regularization
8. D) SMOTE
9. A) TPR and FPR
10. B) False
11. A) Construction bag of words from an email
12. A) We don't have to choose the learning rate.**,** B) It becomes slow when the number of features is very large. **AND** C) We need to iterate.
13. **Regularization**:

* Regularization is a technique used in machine learning and statistical modelling to prevent overfitting.
* It adds a penalty term to the loss function, discouraging large coefficients for features.
* Two common regularization methods are:
  + **L1 Regularization (Lasso)**: Adds the absolute values of coefficients to the loss function.
  + **L2 Regularization (Ridge)**: Adds the squared values of coefficients to the loss function.
* Regularization helps improve model generalization by balancing model complexity and fit to the data.

1. **Algorithms for Regularization**:

* Algorithms that incorporate regularization include:
  + **Lasso Regression**: Uses L1 regularization.
  + **Ridge Regression**: Uses L2 regularization.
  + **Elastic Net**: Combines L1 and L2 penalties.
  + **Logistic Regression with Regularization**: For classification.
  + **Support Vector Machines (SVM)**: Can use L2 regularization.

1. **Error in Linear Regression Equation**:

* In linear regression, the error (also called residual) represents the difference between the actual target values and the predicted values.
* The goal is to minimize the sum of squared errors across all data points.