SLIIT UNI
THE KNOWLEDGE UNIVERSITY

IT2011 - Artificial Intelligence and Machine Learning

Department of Information Technology, Faculty of Computing

Year 2 semester 1 (2025)

Tutorial 05

Supervised Learning Workshop 1

Part 1 - Linear Regression

1. How do you load the Boston.CSV dataset using pandas and display its first five rows?
2. How do you separate the dataset into independent variables (x) and the target variable (y)?
3. How would you split the dataset into training and testing sets using an 80-20 split?
4. How do you create a linear regression model object and train it on the training dataset?
5. How do you retrieve the coefficients and intercept of the trained linear regression model?
6. How would you evaluate the model's performance on the training data using the R-squared metric?
7. How can you calculate the Mean Squared Error (MSE) and Root Mean Squared Error (RMSE) for the test dataset?
8. How can you predict the value of the target variable for a new custom input row?

Part 2 - Logistic Regression

9. How do you load the diabetes.CSV dataset and display its first few rows?
10. How would you separate the dataset into feature variables (x) and the target variable (y)?
11. How do you split the dataset into training and testing sets using an 80-20 ratio?
12. How do you create a logistic regression model object and train it on the training data?
13. How do you extract the learned coefficients and intercept from the trained logistic regression model?

14. How can you use the trained model to predict class labels for the test dataset?
15. How can you predict class probabilities for each observation in the test set?
16. How do you generate a confusion matrix to evaluate model performance?
17. How do you visualize the confusion matrix using a heatmap?
18. How do you calculate the accuracy and misclassification error of the logistic regression model?
19. How do you generate a classification report including precision, recall, and F1-score?