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Machine Learning using AzureML Studio

COURSE OUTLINE

Basics of Machine Learning

- What is machine learning?
- Understanding various aspects of data –type, variables, category
- Common machine learning terms
- Types of machine learning models – classification, regression, clustering etc

Getting started with Azure ML

- What is AzureML and overall architecture
- Creating a free AzureML account
- Azure ML experiment workflow
- Azure ML cheat sheet for model selection

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Data-Pre Processing

- Data input-output- upload data, convert & unpack, Import data
- Data Transformation – Add rows/columns, apply SQL transformation, clean missing data, edit meta-data
- Sample & Split data

Classification 1

- What is logistic regression?
- Understanding logistic regression parameters and their impact
- Understanding confusion matrix, AUC, Accuracy, Precision, Recall & F1 Score

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Classification 2

- What is a decision tree?
- Decision Tree- Ensemble Learning – Bagging and Boosting
- Two class decision boosted decision tree

Classification 3

- What is Decision Forest?
- Two class decision forest
- Multi-class decision forest
- What is Support Vector Machine?

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Hyper-parameter Tuning

- Parameter understanding
- Tuning hyperparameters for best parameter selection

Deploy Webservice

- Preparing the experiment for webservice
- Deploying ML model as a web-service
- Deploying ML web-service in excel

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Regression Analysis 1

- What is linear regression?
- Common metrics
- Linear regression model using OLS

Regression Analysis 2

- Linear regression – R squared
- Gradient descent
- Stochastic gradient descent

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Regression Analysis 3

- What is regression tree?
- What is boosted decision tree regression?
- Experiment boosted decision tree

Clustering

- What is cluster analysis?
- Cluster experiment using K-means
- Cluster scoring and evaluation

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Regression Analysis 3

- What is regression tree?
- What is boosted decision tree regression?
- Experiment boosted decision tree

Clustering

- What is cluster analysis?
- Cluster experiment
- Cluster scoring and evaluation

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Data processing challenges 1

- How to summarize data
- Outlier treatment – clip values
- Clean missing data with Mice

Data processing challenges 2

- SMOTE – create new synthetic observations
- Data normalization – Scale & Reduce
- Joining multiple datasets

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Feature Selection 1

- Pearson Correlation Coefficient
- Chi Square test of independence
- Kendall correlation coefficient

Feature Selection 2

- Spearman's rank correlation
- Filter based selection
- Fischer based LDA

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Recommendation System 1

- Data preparation using recommender split
- Matchbox recommender
- Scoring matchbox recommender

Case Studies

- Loan approval
- Wine Quality prediction
- Predicting market segments using call center data

Case Studies

Loan Approval Prediction

- To know whether an individual will get a loan approved or not

Wine Quality Prediction

- To know the quality of wine based on different parameters

Predicting market segments using call center data

- To differentiate market segment in un-substantiated data and predict patterns for clients