Machine Learning with R and Python

Section 1

1. Introduction to Data Science

2. Business Intelligence Vs Data Analysis

3. Data Analysis Vs Data Scientist

4. Data Scientist Roles.

5. Different Disciplines of Data Science

6. Machine Learning overview

7. Natural Language Processing overview

8. Deep Learning overview

9. Artificial Intelligence overview

10. When to use Machine Learning Models and Deep Learning Models.

11. Applications of Machine Learning

12. Why Machine Learning is the Future

13. What are prerequisites for Data Science?

14. Importance of Statistics & essentials of statistics for DS

15. Essentials of mathematics for DS

16. R language essentials for Data Science

17. Python essentials for Data Science

18. Python numpy essentials for Data Science

[Recorded Sessions of prerequisites will be given free of cost]

19. Different R language packages used for Data Science

20. Different Python modules used for Data Science

21. Installing Python and Anaconda (Mac, Linux & Windows)

22. Installing R and R Studio (Mac, Linux & Windows)

Section 2

23. Data Preprocessing activities

24. Why need to preprocess data

25. Importing the Libraries

26. Importing the Dataset

27. Python: overview of Object-oriented programming: classes & objects

28. Missing Data

29. Categorical Data

30. Splitting the Dataset into the Training set and Test set

31. Feature Scaling

32. Data Preprocessing Template!

Section 3

33. Machine Learning Life Cycle

34. Types of Machine Learning approaches

35. Examples of Supervised Learning.

36. Examples of unsupervised Learning.

37. Example of semi-supervised learning

38. Example of reinforcement learning

39. Types of data sets used into machine learning

40. Transformations required for datasets.

41. Different approaches to prepare train/validation/test datasets

42. Overview of different predictive models. [When to use what]

43. Guide lines for model selection.

43. How to measure accuracy of a model.

Section 4

44. Predictions using Regression

45. Linear Vs Non Linear Regression

46. Types of Linear Regressions

47. What is slope and intercept.

48. How to Derive Simple Linear Regression coefficients.

49. Dataset + Business Problem Description

50. Simple Linear Regression Intuition – Step 1

51. Simple Linear Regression Intuition – Step 2

52. Simple Linear Regression in Python – Step 1

53. Simple Linear Regression in Python – Step 2

54. Simple Linear Regression in Python – Step 3

55. Simple Linear Regression in Python – Step 4

56. Simple Linear Regression in R – Step 1

57. Simple Linear Regression in R – Step 2

58. Simple Linear Regression in R – Step 3

59. Simple Linear Regression in R – Step 4

Section 5

60. Multiple Linear Regression

61. Dataset + Business Problem Description

62. Multiple Linear Regression Intuition – Step 1

63. Multiple Linear Regression Intuition – Step 2

64. Multiple Linear Regression Intuition – Step 3

65. Multiple Linear Regression Intuition – Step 4

66. Prerequisites: What is the P-Value?

67. Multiple Linear Regression Intuition – Step 5

68. Multiple Linear Regression in Python – Step 1

69. Multiple Linear Regression in Python – Step 2

70. Multiple Linear Regression in Python – Step 3

71. Multiple Linear Regression in Python – Backward Elimination – Preparation

72. Multiple Linear Regression in Python – Backward Elimination – HOMEWORK !

73. Multiple Linear Regression in Python – Backward Elimination – Homework Solution

74. Multiple Linear Regression in Python – Automatic Backward Elimination

75. Multiple Linear Regression in R – Step 1

76. Multiple Linear Regression in R – Step 2

77. Multiple Linear Regression in R – Step 3

78. Multiple Linear Regression in R – Backward Elimination – HOMEWORK !

79. Multiple Linear Regression in R – Backward Elimination – Homework Solution

80. Multiple Linear Regression in R – Automatic Backward Elimination

Section 6

81. Polynomial Regression Intuition

82. How to get the dataset

83. Polynomial Regression in Python – Step 1

84. Polynomial Regression in Python – Step 2

85. Polynomial Regression in Python – Step 3

86. Polynomial Regression in Python – Step 4

87. Python Regression Template

88. Polynomial Regression in R – Step 1

89. Polynomial Regression in R – Step 2

90. Polynomial Regression in R – Step 3

91. Polynomial Regression in R – Step 4

92. R Regression Template

Section 7

93. Gradient Descent algorithm for Simple linear Regression.

94. Gradient Descent algorithm for Multiple Linear Regression.

95. Gradient Descent algorithm for polynomial regression.

96. Stochastic Gradient Descent algorithm.

97. Batch gradient Descent algorithm.

Section 8

98. Support Vector Regression

99. How to get the dataset

100. SVR Intuition

102. SVR in Python

103. SVR in R

Section 9

104. Decision Tree Regression

105. Decision Tree Regression Intuition

106. How to get the dataset

107. Decision Tree Regression in Python

108. Decision Tree Regression in R

Section 10

109. Random Forest Regression

110. Random Forest Regression Intuition

111. How to get the dataset

112. Random Forest Regression in Python

113. Random Forest Regression in R

Section 11

114. Evaluating Regression Models.

115. R-Squared Intuition

116. Adjusted R-Squared Intuition

117. Evaluating Regression Models Performance – Homework's Final Part

118. Interpreting Linear Regression Coefficients

119. Developing Accuracy testing functions.

Section 12

120. Classification Algorithms

121. What is a classification model?

122. Different types of classification models

123. When to use what type of model

124. How to measure accuracy of a classification model

Section 13

125. Logistic Regression

126. How to get the dataset

127. Logistic Regression in Python – Step 1

128. Logistic Regression in Python – Step 2

129. Logistic Regression in Python – Step 3

130. Logistic Regression in Python – Step 4

131. Logistic Regression in Python – Step 5

132. Python Classification Template

133. Logistic Regression in R – Step 1

134. Logistic Regression in R – Step 2

135. Logistic Regression in R – Step 3

136. Logistic Regression in R – Step 4

137. Logistic Regression in R – Step 5

138. R Classification Template

Section 14

139. K-Nearest Neighbors [knn]

140. How to get the dataset

141. K-NN in Python

142. K-NN in R

Section 15

143. Support Vector Machine [svm]

144. SVM Intuition

145. How to get the dataset

146. SVM in Python

147. SVM in R

Section 16

148. Kernel SVM

149. Mapping to a higher dimension

150. The Kernel Trick

151. Types of Kernel Functions

152. How to get the dataset

153. Kernel SVM in Python

154. Kernel SVM in R

Section 17

155. Naive Bayes Classifier

156. Bayes Theorem

157. Naive Bayes in Python

158. Naive Bayes in R

Section 18

159. Decision Tree Classifier

160. Decision Tree Classification Intuition

161. Entropy of Target variable

162. Entropy of Input Variable on Target variable

163. Information Gain

164. How to get the dataset

165. Decision Tree Classification in Python

166. Decision Tree Classification in R

Section 19

167. Random Forest Classification

168. How random forest works

169. How to get the dataset

170. Random Forest Classification in Python

171. Random Forest Classification in R

Section 20

172. Evaluating classification models performance

173. False Positives & False Negatives

174. Confusion Matrix

175. Accuracy Paradox

176. CAP Curve

177. CAP Curve Analysis

Section 21

178. Evaluating classification models performance

179. False Positives & False Negatives

180. Confusion Matrix

181. Accuracy Paradox

182. CAP Curve

183. CAP Curve Analysis

Section 22

184. K-means Clustering

185. K-Means Random Initialization Trap

186. K-Means Selecting the Number Of Clusters

187. How to get the dataset

188. K-Means Clustering in Python

189. K-Means Clustering in R

Section 23

190. Hierarchical Clustering

191. Hierarchical Clustering How Dendrograms Work

192. Hierarchical Clustering Using Dendrograms

193. How to get the dataset

194. HC in Python – Step 1

195. HC in Python – Step 2

196. HC in Python – Step 3

197. HC in Python – Step 4

198. HC in Python – Step 5

199. HC in R – Step 1

200. HC in R – Step 2

201. HC in R – Step 3

202. HC in R – Step 4

203. HC in R – Step 5

Section 24

204. Association Rule Mining

205. What are recommendation systems?

206. Types of recommendation systems

207. Different ARM algorithms.

208. How ARM used for recommendations.

Section 25

209. Apriori algorithm [one of arm]

210. Apriori Intuition

211. How to get the dataset

212. Apriori in R – Step 1

213. Apriori in R – Step 2

214. Apriori in R – Step 3

215. Apriori in Python – Step 1

216. Apriori in Python – Step 2

217. Apriori in Python – Step 3

Section 26

218. Eclat algorithm [ARM]

219. Eclat Intuition

220. How to get the dataset

221. Eclat in R

Section 27

222. FPGrowth algorithm [ARM]

223. Problems with other ARM model.

224. How to construct Growing tree.

225. How to get the dataset

226. FPGrowth in Python

227. FPGrowth in R

Section 28

228. Overview of reinforcement leering.

[Deeply you will learn reinforcement and q-learning in

Artificial Intelligence course]

229. Overview of text mining and nlp.

[Deeply you will learn nlp with python with chatbot development

In “NLP with Python with chatbots using AI" course]

230. Overview of Neural networks and Deep Learning.

[We do deep dive about Deep learning in "Deep Learning" course

With ANN with NN/ANN with DNN/CNN/RNN/SOM with practical’s

231. Case study on Machine Learning.