Main Content

| 1. | Welco | me to D | L101 | 1 |
|----|--------|---------|----------------------------------|----|
| | a. | Lectur | re | 4 |
| | b. | Works | hop | 5 |
| | C. | All Top | pics | 7 |
| | d. | DL101 | : Linear Regression | 8 |
| | e. | Course | e Journey | 9 |
| | f. | Facebo | ook Group | 10 |
| | g. | Docun | nent for DL101 | 11 |
| 2. | Al Ove | rview | | 12 |
| | a. | Al and | Machine Learning | 13 |
| | | i. | History of AI | 15 |
| | | ii. | What is AI? | 18 |
| | | iii. | AI, ML and DL | 19 |
| | | iv. | Type of Machine Learning | 20 |
| | | ٧. | What is Supervised Learning? | 22 |
| | | vi. | What is Unsupervised Learning? | 23 |
| | | vii. | What is Reinforcement Learning | 24 |
| | b. | Super | vised Learning | 27 |
| | | i. | Concept of Supervised Learning | 28 |
| | | ii. | Regression and Classification | 30 |
| | | iii. | Classification | 31 |
| | | iv. | Regression | 33 |
| 3. | Introd | uction | | 37 |
| | a. | What i | s Linear Regression | 39 |
| | b. | Extens | sion to Neural Network | 45 |
| | C. | Real W | Vorld Application | 49 |
| 4. | Model | Creatio | 55 | |
| | a. | Data | | 59 |
| | | i. | Data Stating | 61 |
| | | ii. | Data Requirement | 69 |
| | b. | Model | | 75 |
| | | i. | Assumption | 77 |
| | | ii. | Real Face of the Model | 80 |
| | | iii. | Cost function and Cost Landscape | 90 |
| | | iv. | How to Create Model (Math) | 98 |

| | | | 1. Least Square Method | 100 |
|----|----------------|---------------------------------|---|-----|
| | | | 2. Calculation Example | 109 |
| | | ٧. | How to Create Model (Code) | 116 |
| | | vi. | Further Reading | 125 |
| | C. | Predi | ction | 131 |
| | | i. | 1-Sample | 135 |
| | | ii. | Multi-Sample | 140 |
| | | iii. | Code | 149 |
| 5. | Basic Workshop | | | 157 |
| | a. | a. Supervised Learning Workflow | | |
| | b. | Code | Pipeline | 159 |
| | | i. | Import Libraries | 160 |
| | | ii. | Read Data | 162 |
| | | iii. | Clean Data | 164 |
| | | | 1. Handle Missing Values | 165 |
| | | | 2. Handle Outliers | 167 |
| | | iv. | Train/Test | 169 |
| | | ٧. | Data Preparation | 171 |
| | | | 1. Type of Features | 173 |
| | | | 2. Type of Categorical Features | 175 |
| | | | 3. Ordinal Encoding | 177 |
| | | | 4. One Hot Encoding | 180 |
| | | | 5. Feature Scaling | 184 |
| | | vi. | Create Model | 186 |
| | | | 1. Setting Parameter | 187 |
| | | | 2. Train Model | 189 |
| | | | 3. Model's Weight & Bias | 191 |
| | | vii. | Prediction | 193 |
| | | viii. | Model Evaluation | 195 |
| | | | 1. Scoring | 196 |
| | | | 2. Scatter Plot between Predicted & Actual Values | 199 |
| | | ix. | Model Deployment | 202 |
| | C. | Al in l | Marketing | 205 |
| | i. Abstract | | | 206 |
| | | ii. | Why this project important? | 207 |
| | | iii. | Who this project is for? | 208 |
| | | iv. | Ads Dataset | 209 |

| | | ٧. | What we learn from this projec | t? 211 |
|--------|----------|------------------|--------------------------------|--------|
| | | vi. | File | 213 |
| | d. | AI in Investment | | |
| | | i. | Abstract | 215 |
| | | ii. | Why this project important? | 216 |
| | | iii. | Who this project is for? | 217 |
| | | iv. | SET50 Dataset | 218 |
| | | ٧. | What we learn from this projec | t? 220 |
| | | vi. | File | 222 |
| | e. | Smart Farm | | 224 |
| | | i. | Abstract | 225 |
| | | ii. | Why this project important? | 226 |
| | | iii. | Who this project is for? | 227 |
| | | iv. | Rice Dataset | 228 |
| | | ٧. | What we learn from this projec | t? 231 |
| | | vi. | File | 233 |
| | f. | Al in E | Business | 235 |
| | | i. | Abstract | 236 |
| | | ii. | Why this project important? | 237 |
| | | iii. | Who this project is for? | 238 |
| | | iv. | Bike Sharing Dataset | 239 |
| | | ٧. | What we learn from this projec | t? 242 |
| | | vi. | File | 244 |
| | g. | Al in lı | nsurance | 245 |
| | | i. | Abstract | 246 |
| | | ii. | Why this project important? | 247 |
| | | iii. | Who this project is for? | 248 |
| | | iv. | Insurance Dataset | 249 |
| | | ٧. | What we learn from this projec | t? 251 |
| | | vi. | File | 250 |
| 6. | Model | Improvement | | 258 |
| | a. | Assun | nption | 260 |
| | b. c. | Proble | em with Linearly Dependent | 314 |
| | | Soluti | on | 344 |
| d. Reg | | Regul | arization | 375 |
| | | i. | What is Regularization? | 379 |
| | | ii. | Ridge Regression | 384 |
| | | | | |

| | | | 1. | What is Ridge Regression? | 385 | |
|--------------------|------------------|-------|----------|---------------------------------------|-----|--|
| | | | 2. | Geometric View | 387 | |
| | | | 3. | Properties | 401 | |
| | | | 4. | Model Creation | 403 | |
| | | | 5. | How to find Lambda | 407 | |
| | | | 6. | Code | 412 | |
| | | iii. | Lasso | Regression | 421 | |
| | | | 1. | What is Lasso Regression? | 422 | |
| | | | 2. | Geometric View | 424 | |
| | | | 3. | Properties | 437 | |
| | | | 4. | Model Creation | 445 | |
| | | | 5. | How to find Lambda | 451 | |
| | | | 6. | Code | 456 | |
| | | iv. | Elastic | Net | 464 | |
| | | | 1. | What is Elastic Net? | 465 | |
| | | | 2. | Geometric View | 467 | |
| | | | 3. | Properties | 472 | |
| | | | 4. | Model Creation | 481 | |
| | | | 5. | How to find Lambda & $11_{\rm ratio}$ | 487 | |
| | | | 6. | Code | 492 | |
| | | ٧. | Conclu | ısion | 501 | |
| 7. | Advance Workshop | | | 505 | | |
| | a. | Super | vised Le | rised Learning Workflow | | |
| | b. Code Pipeline | | | 507 | | |
| c. Al in Car Price | | | ar Price | ! | 511 | |
| | | i. | Abstra | ct | 512 | |
| | | ii. | Why th | nis project important? | 513 | |
| | | iii. | Who th | nis project is for? | 514 | |
| | | iv. | Ads Da | ataset | 515 | |
| | | ٧. | What v | ve learn from this project? | 517 | |
| | | vi. | File | | 523 | |