

Learning Schedule

****12-Week Data Science Learning Schedule****

****Motivational Quote:**** "Believe you can and you're halfway there." - Theodore Roosevelt

Week 1: Math and Statistics Fundamentals (20 hours)

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

Topics

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

1. Linear Algebra: Vector operations, matrix multiplication, and eigenvalues
2. Calculus: Derivatives, gradient descent, and optimization
3. Probability and Statistics: Bayes' theorem, hypothesis testing, and confidence intervals

Resources

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Coursera's Data Science Learning Path (Linear Algebra and Calculus modules)

* Khan Academy's Probability and Statistics course

Practical Exercises

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Practice vector operations and matrix multiplication using NumPy

* Implement gradient descent in Python

* Solve probability and statistics problems on Khan Academy

Assessments

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Complete quizzes on Coursera's Linear Algebra and Calculus modules

* Take a probability and statistics quiz on Khan Academy

Week 2: Python and Data Preprocessing (20 hours)

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

Topics

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

1. Python Basics: Data types, control structures, and functions
2. Data Preprocessing: Handling missing values, data normalization, and feature scaling

Resources

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Coursera's Python for Data Science course

* Data Science Tutorials' Data Preprocessing tutorial

Practical Exercises

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Practice Python basics using Jupyter Notebook

* Implement data preprocessing techniques using Pandas and Scikit-learn

Assessments

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Complete Python exercises on Coursera

* Preprocess a dataset using Pandas and Scikit-learn

Week 3: Data Visualization and Exploration (20 hours)

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

Topics

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

1. Data Visualization: Matplotlib, Seaborn, and Plotly

2. Data Exploration: Summary statistics, data profiling, and correlation analysis

Resources

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Coursera's Data Visualization course

* Data Science Tutorials' Data Exploration tutorial

Practical Exercises

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Create visualizations using Matplotlib, Seaborn, and Plotly

* Explore a dataset using Pandas and Scikit-learn

Assessments

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Create a visualization project using a real-world dataset

* Complete data exploration exercises on Coursera

Week 4: Machine Learning Fundamentals (20 hours)

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

Topics

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

1. Supervised Learning: Regression, classification, and model evaluation
2. Unsupervised Learning: Clustering, dimensionality reduction, and anomaly detection

Resources

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Coursera's Machine Learning course

* Data Science Tutorials' Machine Learning tutorial

Practical Exercises

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Implement regression and classification models using Scikit-learn

* Apply clustering and dimensionality reduction techniques using Scikit-learn

Assessments

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Complete machine learning exercises on Coursera

* Implement a supervised learning model using Scikit-learn

Week 5: Model Evaluation and Hyperparameter Tuning (20 hours)

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

Topics

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

1. Model Evaluation: Metrics, cross-validation, and bias-variance tradeoff
2. Hyperparameter Tuning: Grid search, random search, and Bayesian optimization

Resources

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Coursera's Model Evaluation and Hyperparameter Tuning course

* Data Science Tutorials' Model Evaluation and Hyperparameter Tuning tutorial

Practical Exercises

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Evaluate a machine learning model using cross-validation

* Tune hyperparameters using GridSearchCV and RandomizedSearchCV

Assessments

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Complete model evaluation exercises on Coursera

* Tune hyperparameters for a machine learning model using Scikit-learn

Week 6: Advanced Machine Learning Topics (20 hours)

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

Topics

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

1. Deep Learning: Neural networks, convolutional neural networks, and recurrent neural networks
2. Ensemble Methods: Bagging, boosting, and stacking

Resources

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Coursera's Deep Learning course

* Data Science Tutorials' Advanced Machine Learning tutorial

Practical Exercises

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Implement a neural network using Keras or TensorFlow

* Apply ensemble methods using Scikit-learn

Assessments

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Complete deep learning exercises on Coursera

* Implement an ensemble method using Scikit-learn

Week 7: Natural Language Processing and Big Data (20 hours)

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

Topics

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

1. Natural Language Processing: Text preprocessing, tokenization, and topic modeling
2. Big Data: Hadoop, Spark, and distributed computing

Resources

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Coursera's Natural Language Processing course

* Data Science Tutorials' Big Data tutorial

Practical Exercises

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Preprocess text data using NLTK and spaCy

* Apply big data techniques using PySpark

Assessments

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Complete natural language processing exercises on Coursera

* Process a large dataset using PySpark

Week 8: Data Storytelling and Communication (20 hours)

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

Topics

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

1. Data Storytelling: Effective communication, visualization, and narrative
2. Data Communication: Report writing, presentation, and stakeholder management

Resources

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Coursera's Data Storytelling course

* Data Science Tutorials' Data Communication tutorial

Practical Exercises

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Create a data story using visualization and narrative

* Write a data report and present it to an audience

Assessments

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Complete data storytelling exercises on Coursera

* Present a data report to an audience

Week 9-12: Capstone Project (40 hours)

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

Topics

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

1. Apply data science skills to a real-world project
2. Develop a project proposal, data wrangling, modeling, and evaluation

Resources

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Coursera's Data Science Capstone project

* GitHub repositories for capstone projects

Practical Exercises

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Develop a capstone project proposal

* Implement data wrangling, modeling, and evaluation using Scikit-learn and other libraries

Assessments

Checklist:

Checkbox 1

Checkbox 2

Checkbox 3

Checkbox 4

Checkbox 5

* Complete the capstone project

* Present the capstone project to an audience

Motivational Quote: "The biggest risk is not taking any risk..." - Mark Zuckerberg