

# Data Science Roadmap for Beginners

Following is the roadmap to learn **Data Science** skills for a total beginner (**no coding** or **computer science background** needed). It includes FREE learning resources for technical skills (or tool skills) and soft (or core) skills 🦉

Total Duration: **6 Months**

**3 hours** in Tool Skills + **1 hour** in Core Skills = **4 hours** study Every Day



## Week 1 and 2: Python 🦉

- Topics
  - Variables, Numbers, Strings
  - Lists, Dictionaries, Tuples
  - If condition, for loop
  - Functions, modules

- Read, write files
  - Exception handling
  - Classes, Objects
- Learning Resources
  - Track A (Free)
    - Codebasics python tutorials (first 16) - <https://bit.ly/3X6CCC7>
    - Codebasics python HINDI tutorials - <https://bit.ly/3vmXrgw>
  - Track B (Paid with minor fees)
    - Python course: <https://codebasics.io/courses/python-for-beginner-and-intermediate-learners>
- **Assignment**
  - ☐ Track A: Finish all these exercises: <https://bit.ly/3k1mof5>
  - ☐ Track B: Finish exercises and quizzes for relevant topics
  - ☐ Create a professional looking LinkedIn profile
    - Have a clear profile picture, banner image (data scientist loading...)
    - Add tags such as: Open to work etc.

## Week 3, 4: Pandas, Data Visualization (matplotlib or seaborn)

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- **Tech Skills**
  - **numpy**
    - numpy YouTube playlist: <https://bit.ly/3GTppa8>
  - **pandas**
    - pandas YouTube playlist (**first 10 videos only**): <https://bit.ly/3vPJWpX>
  - **matplotlib or seaborn**
    - Do not learn both
    - matplotlib and seaborn are libraries for data visualization and exploration
    - matplotlib YouTube playlist: <https://bit.ly/3k55egu>
- **Core/Soft Skills**
  - **Linkedin**

- Start following prominent data science, analytics influencers
  - Daliana Liu: <https://www.linkedin.com/in/dalianaliu/>
  - Hemanand Vadivel: <https://www.linkedin.com/in/hemvad/>
- Increase engagement
  - Start commenting meaningfully on data science and career related posts
  - Helps network with others working in the industry build connections
  - Learning and brainstorming opportunity
- Remember **online presence is a new form of resume**
- **Business Fundamentals - Soft Skill**
  - Learn business concepts from ThinkSchool and other YT Case Studies
  - Example: How Amul beat competition: <https://youtu.be/nnwqtZiYMxQ>
- **Discord**
  - Start asking questions and get help from the community. This post shows how to ask questions the right way: <https://bit.ly/3I70Ebl>
  - Join codebasics discord server: <https://discord.gg/r42Kbuk>
- **Assignment**
  - ☐ Write meaningful comments on at least **10 data science related LinkedIn posts**
  - ☐ Note down your key learnings from **3 case studies** on ThinkSchool and share with your friend

## Week 5, 6, 7, 8: Statistics and Math for Data Science

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- Finish this excellent Khan academy course on statistics and probability
  - Course link: <https://www.khanacademy.org/math/statistics-probability>
- When you are doing khan academy course, you can use stat quest YouTube channel to clear your doubts
- Complete math and statistics for data science YouTube playlist with Python code (Khan academy course doesn't have Python code)
  - Playlist link: <https://bit.ly/3QrSXis>
- **Assignment**
  - ☐ Finish all exercises in that playlist: <https://bit.ly/3QrSXis>

- ☐ Perform EDA (Exploratory data analysis) on **at least 3 datasets** on <https://www.kaggle.com/>

## Week 9, 10, 11, 12: Machine Learning

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- **Machine Learning**

- Topics
  - Feature engineering
  - Regression
  - Classification
  - Clustering
- Learning Resources
  - YouTube playlist (more than 2 million views): <https://bit.ly/3io5qqX>
    - First 21 videos
  - Feature engineering playlist: <https://bit.ly/3IFa3Yf>

- **Core/Soft Skills**

- **Project Management**
  - Scrum: <https://scrumtrainingseries.com/>
  - Kanban: <https://youtu.be/jf0tlbt9lx0>
  - Tools: JIRA, Notion

- **Assignment**

- ☐ Complete all exercises in ML playlist: <https://bit.ly/3io5qqX>
- ☐ Work on **2 Kaggle ML notebooks**
- ☐ Write **2 LinkedIn posts** on whatever you have learnt in ML
- ☐ Discord: Help people with **at least 10 answers**

## Week 13, 14, 15: Machine Learning Projects with Deployment

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- You need to finish **two** end to end ML projects. One on **Regression**, the other on **Classification**
- Regression Project: Bangalore property price prediction
  - YouTube playlist link: <https://bit.ly/3ivycWr>

- Project covers following
  - Data cleaning
  - Feature engineering
  - Model building and hyper parameter tuning
  - Write flask server as a web backend
  - Building website for price prediction
  - Deployment to AWS
- Classification Project: Sports celebrity image classification
  - YouTube playlist link: <https://bit.ly/3ioaMSU>
  - Project covers following
    - Data collection and data cleaning
    - Feature engineering and model training
    - Flask server as a web backend
    - Building website and deployment
- **Assignment**
  - In above two projects make following changes
    - ☐ Use **FastAPI** instead of **flask**. FastAPI tutorial: <https://youtu.be/Wr1JhTt1Xg>
    - ☐ **Regression project**: Instead of property prediction, take any other project of your interest from Kaggle for regression
    - ☐ **Classification project**: Instead of sports celebrity classification, take any other project of your interest from Kaggle for classification and build end to end solution along with **deployment to AWS or Azure**

## Week 16, 17: SQL 💰

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- Topics
  - Basics of relational databases
  - Basic Queries: SELECT, WHERE LIKE, DISTINCT, BETWEEN, GROUP BY, ORDER BY
  - Advanced Queries: CTE, Subqueries, Window Functions
  - Joins: Left, Right, Inner, Full
  - Stored procedures and functions
  - No need to learn database creation, indexes, triggers etc. as those things are rarely used by data scientists

- Learning Resources
  - Track A
    - Khan academy: <https://bit.ly/3WFku20>
    - <https://www.w3schools.com/sql/>
    - <https://sqlbolt.com/>
  - Track B
    - SQL course for data professionals: <https://codebasics.io/courses/sql-beginner-to-advanced-for-data-professionals>
- **Core/Soft Skills**
  - Presentation skills
    - Death by PowerPoint: <https://youtu.be/lwpi1Lm6dFo>
- **Assignment**
  - ☐ Participate in resume project challenge on <https://codebasics.io/>
    - These challenges help you improve technical skills, soft skills and business understanding
    - Link: <https://codebasics.io/event/codebasics-resume-project-challenge>
  - ☐ Make a LinkedIn post with a submission of your resume project challenge
    - Sample post: <https://bit.ly/3GxGaq1>
    - Codebasics is promoting winning entries to employers. This way you can get interview calls. We do this in two ways
      - We have a database of employers hiring for data analyst positions. We send first 10 or 20 profiles based on their performance
      - LinkedIn post by Dhaval (who has more than 100k followers and some of them are HR managers, data analytics senior managers): <https://bit.ly/3jnii5c>

## Week 18, 19, 20: BI Tool (Power BI or Tableau)

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- **Power BI**
  - Track A (Free)
    - Sales insights Power BI project: <https://bit.ly/3C1WKgA>
    - Personal finance project: <https://www.youtube.com/watch?v=pqSoCa2NGj4>
    - HR data analytics project: <https://bit.ly/3C7cw9P>

- Track B (Paid for affordable fees)
  - Sales insights project tutorial playlist: <https://bit.ly/3C1WKgA>
  - My Power BI course that can make you job ready: <https://codebasics.io/courses/power-bi-data-analysis-with-end-to-end-project>
- **Tableau**
  - Codebasics sales insights project: <http://bit.ly/3YQSBFV>
  - HINDI codebasics sales insights project: <https://bit.ly/3hZXUCb>
- Should I learn Power BI or Tableau?
  - If someone asks me to pick between Power BI and Tableau, I always suggest Power BI as it is growing in popularity as compared to Tableau.
  - This Gartner research shows Power BI is leading a BI game: <https://info.microsoft.com/ww-landing-2022-gartner-mq-report-on-bi-and-analytics-platforms.html?LCID=EN-US>
- **Assignment**
  - ☐ Participate in one resume project challenge
    - These challenges help you improve technical skills, soft skills and business understanding
  - ☐ Make a LinkedIn post with video presentation
    - Example post: <https://bit.ly/3WMTgGK> (Naveen S)
  - ☐ Discord server participation

## Week 21, 22, 23, 24: Deep Learning 🤖

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- Deep Learning YouTube playlist: <https://bit.ly/3vOZ3zV>
- End to end potato disease classification project: <https://bit.ly/3QzkVJi>
- **Assignment**
  - ☐ Instead of potato plant images use tomato plant images or some other image classification dataset
  - ☐ Deploy to Azure instead of GCP

- ☐ Create a presentation as if you are presenting to stakeholders and upload video presentation on LinkedIn

## Week 25 onwards.... 😊😊😊

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- More projects 📁
- Online brand building through LinkedIn, Kaggle, Discord, Opensource contribution 👥
- Resume and interview preparation 📄
  - Resume prep video: <https://www.youtube.com/watch?v=buQSI8NLOMw>
- Job application and Success 🚀

## Tips of effective learning 🔥

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- **Spend less time in consuming information, more time in**
  - Digesting
  - Implementing
  - Sharing
- **Group learning**
  - Use **partner-and-group-finder** channel on codebasics discord server for group study and hold each other accountable for the progress of your study plan. Here is the discord server link: <https://discord.gg/r42Kbuk>

## Inspirational Stories 😊

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- Career transition stories: <https://bit.ly/3PUZ4f3>

## Advanced Topics 🔭

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- **ML Ops. What is it and how can I learn it?**



- This post has necessary information: <https://bit.ly/3X220Jk>
- **Cloud ML Platforms**
  - Big cloud service providers such as AWS, Azure, Google Cloud have their own ML offering such as Amazon Sagemaker in case of AWS. As a fresher it is ok if you are not familiar with these cloud platforms but once you have some experience it is good to have experience and know-how of at least one cloud ML platform.
- **Natural Language Processing (NLP)**
  - NLP YouTube playlist: <https://bit.ly/3XnjfEZ>
- **Computer Vision**
  - Computer vision is a vast field where one can use OpenCV, PyTorch, Tensorflow etc for deep learning approaches for computer vision as well. You can find many resources online on this. I do not have a specific recommendation for this