**Data Science and Machine Learning Roadmap.**

1. **Python:**

Make sure to take your time at this stage because this is the foundation of everything. Don’t rush. Ensure you understand concepts like object-oriented programming, data structures and algorithms and solve a lot of questions. Do a lot of personal projects and make sure your post on your github. (Github is easy to learn)

Expected duration: 4- 6months

Resources:

1. Learn Python[: 2021 Complete Python Bootcamp From Zero to Hero in Python](https://www.udemy.com/course/complete-python-bootcamp/)
2. Learn Data structures[: Algorithms and Data Structures Tutorial- Full Course for Beginners](https://www.youtube.com/watch?v=8hly31xKli0&t=14319s)
3. Solve algorithm problems: [Leetcode](https://leetcode.com/problemset/all/)
4. Learn Git & GitHub (optional): [Git and GitHub for Beginners](https://youtu.be/RGOj5yH7evk)
5. Basics of Data Science:

Here you begin to study python libraries that makes data science easy for you. Such as; Numpy, Pandas, Matplotlib, Seaborn, SQL, (Excel/ PowerBI). Take your time. Don’t rush. Do a lot of personal projects and make sure your post on your github

Expected duration: 3-4months

Resources:

1. Learn DS: [Python for Data Science and Machine Learning Bootcamp](https://www.udemy.com/course/python-for-data-science-and-machine-learning-bootcamp/) (just watch up till section 13)
2. SQL: [SQL for Data Analytics](https://www.udemy.com/course/the-complete-sql-masterclass-for-data-analytics/?src=sac&kw=sql+for+data)
3. Excel (optional): [Microsoft Excel Tutorial for beginners](https://youtu.be/Vl0H-qTclOg)
4. Machine Learning:

Fret not! This is still part of data science.

Take your time here. Read a lot of articles. Read articles before coding. Practice!!! Participate in machine learning competitions.

Learn algorithms such as Linear and Logistic regression, Decision trees, Random Forest, KNN, KMeans clustering, XGBoost, LightGBM, CatBoost. Don’t worry, implementing them is fairly similar, understanding the theory is the most important. After which, you can learn to write some ML models from scratch (this will solidify your understanding of the theories), also learn to deploy your models to web where they are now useful. Again, don’t forget to do personal projects and upload on GitHub too.

Expected Duration: 4-6 months

Resources:

1. Learn ML: [Python for Data Science and Machine Learning Bootcamp](https://www.udemy.com/course/python-for-data-science-and-machine-learning-bootcamp/) (from 13 to KMeans clustering)
2. ML from Scratch: [Machine Learning from scratch](https://www.youtube.com/watch?v=ngLyX54e1LU&list=PLqnslRFeH2Upcrywf-u2etjdxxkL8nl7E)
3. Model Deployment: [Deployment of ML models](https://www.youtube.com/watch?v=bjsJOl8gz5k&list=PLZoTAELRMXVOAvUbePX1lTdxQR8EY35Z1) (you can take a proper course later in the future)
4. Deep Learning:

At this point, you’re going deep into ML already. Make sure you understand the basics too.

Then pick a tool to code with (we’ve TensorFlow, Pytorch, Fastai etc.)

Then take your time to learn and understand artificial neural networks, Convolutional Neural networks, Recurrent Neural networks, Natural language processing and how to code them too using nay of the tools above. TensorFlow is recommended. After learning, do a few projects and deploy.

Expected duration: 4-6months

Resources:

1. Learn the basics and math: [Deep learning specialization](https://www.googleadservices.com/pagead/aclk?sa=L&ai=DChcSEwjypv2a6PrzAhXKse0KHY0xCzcYABAAGgJkZw&ae=2&ohost=www.google.com&cid=CAESQeD2MWlr1ZtiD7GM51ibBZ4qa1jS-a7OZVS6ponQOjfkuVHTCi0WM639q80iGbDQvFvS0ih9uTrKPSfMFt6mnMl_&sig=AOD64_3vgUCrwo0Pli0xuWMbIu7v5PTSOA&q&adurl&ved=2ahUKEwjYlPaa6PrzAhWOTsAKHS_UAqIQ0Qx6BAgCEAE)
2. Learn to use TF: [Complete TensorFlow 2 and Keras Bootcamp](https://www.udemy.com/course/complete-tensorflow-2-and-keras-deep-learning-bootcamp/)

**Special Notes:**

1. Make sure you’ve a mentor. They let you know when you should stop in these courses
2. Some stuffs are optional but an added advantage
3. Join a community to learn more
4. This document isn’t exhaustive.
5. Personal projects mean projects that you didn’t follow a particular tutorial to achieve
6. The journey isn’t easy but interesting and rewarding.