# 100 Days Of Machine Learning ( ML ) Coursework

**Motivation for 100 Days of ML Telegram Group**

Machine Learning is the most transformative technology of our time. Whether it's helping us discover new drugs for major diseases, fighting fraud, generating music, improving supply chain efficiency, the list of applications is truly endless. For us as a community to be able to make valuable contributions to the world, we need to master this technology. This is a call to action, a battle cry, a spark that will light a movement to radically improve the state of humanity. **100 Days of ML** Code is a commitment to better your understanding of this powerful tool by dedicating at least 1 hour of your time every day to studying and/or coding machine learning for 100 days.

## Eligibility

Everyone is eligible, even people who've never coded before and ready to strive on an awesome journey of learning starting from 1st January , 2019 !!

## My Pledge

1. I pledge to dedicate at least one hour of everyday toward coding and/or studying Machine Learning.
2. I pledge to write about my progress (with the #100DaysOfMLCode hashtag).
3. When applicable, I will post all relevant codes to a repository publicly available over GitHub or in a Google Colaboratory Notebook so that others can get helped too !!

At the outset, I thought it would be useful to clarify my interests within the field and the goals I'd like to achieve by engaging with this project.

## My Goals

At the end of this **100 Days Of ML** Code journey, I would like to be able to show a rich portfolio of code, analysis, and narrative treating all the above topics and models plus all the additional content , I'll invariably discover over the course of this learning journey.

I'd also like to be able to explain and demonstrate (at a reasonably granular level) the mathematical machinery underpinning machine learning.

Finally — and, I think, most importantly — I'd like to contribute to the plethora of existing resources aimed at encouraging others toward engaging with machine learning. I agree with the quote that, "machine learning is the most transformative and important technology of our time". My aim throughout this process will be to critically engage with freely accessible materials while always being sure to provide useful links.

I hereby accept **100 Days of ML** Code Challenge! I'd like to thank the community around for such a productive endeavor. I very much look forward to participating in this challenge .

** Thanks for joining the group - Ayon Roy !! **HAPPY LEARNING** !!**

If you see anything above violating your privacy/lifestyle , immediately report it to Ayon Roy { Telegram username @ayonroy2000 } .

Last Compiled By **Ayon Roy** for 100 Days of ML Telegram Group on 1/1/2019 at Delhi , India !!

# COURSEWORK

## For

## 100 Days Of ML

To all the members of 100 Days Of ML Telegram Group ,

This is an independent coursework mainly designed for the members of the telegram group for 100 Days of Machine Learning initiated by **Ayon Roy** . All the members are free to move forward by making commitments to this Coursework , however it`s not a compulsion to follow the specific path mentioned in the coursework ; you are free to utilize & commit your time for next 100 Days in the field of Machine Learning .

I know that being a student / working professional , sometimes it may not be possible for you to devote 1 hour on a daily basis , due to exams and other life goals like friends , families etc. and it`s quite cool to keep learning ML alongside these . But the main point is that " **PATIENCE , COMMITMENT IS THE KEY TO SUCCESS** " , keeping this in mind ; you are requested to move forward .

It`s not compulsory that you start the course from 1/1/19 only , you may start later due to exams or any unavoidable conditions ; the group and it`s members are here to help you even after the suggested end of 100 Days Of ML i.e. 10th April , 2019 . But do understand that this initiative prompts you to devote 100 hours in total and I hope you all can do this as per your convenience . Don`t rush as per the coursework or other group members , take your time and dive into Machine Learning patiently and with full confidence .

**I along with mentors and other members are here to help you along the journey , but do consider asking your doubts only after searching for the same on Google and still if you face any difficulty , then we are here for your support !**

**Don`t worry about the monthly / weekly deadlines , try to understand the concepts well !! Take your time !!**

Regards ,

**Ayon Roy**

( Creator of the 100 Days Of ML Telegram group )

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# 100 Days Of Machine Learning ( ML ) Coursework

**[B] – *Specially Suggested for Beginners* ; these can be / must be completed by all for better understanding of ML .**

# Month 1

Mathematics is the prerequisite for Machine Learning. Mathematics subject is crucial for many high demand remunerative career fields such as Computer Science, Data Science and Artificial Intelligence.

**Week 1 : Linear Algebra [B]**
https://www.khanacademy.org/math/linear-algebra

**Week 2 : Calculus [B]**
https://www.youtube.com/playlist?list=PLZHQObOWTQDMsr9K-rj53DwVRMYO3t5Yr
**or https://www.mathsisfun.com/calculus/ ; want theoretical notes , find it at** https://the-learning-machine.com/article/machine-learning/calculus .

**Week 3 : Probability [B]**
https://www.edx.org/course/introduction-probability-science-mitx-6-041x-2

**Week 4 : Statistics [B]**
**http://alex.smola.org/teaching/cmu2013-10-701/stats.html**

**Algorithms ( Only if you want to learn proper software development ) [ Highly optional ]**
This is an overview of what the students study as the subject Data Structures & Algorithm . So if you are fluent with this part , you can skip this !!
https://www.edx.org/course/algorithm-design-analysis-pennx-sd3x

**Note** :
* Please try to finish the monthly targets of Month 1 as soon as possible , so that you can get ample amount for time for exploring the courses in Month 2 . They are rock strong courses to work upon which will require a lot of commitment , time and patience !!
* If you like to get theoretical notes for Mathematical concepts of Month 1 , view it in the Miscellaneous Section .
* It`s not mandatory to do all the courses mentioned above , if you are quite fluent with these parts , you are free to skip them out and move on to Month 2 targets.
* There are no weekly assignments for the coursework , if you want to do the assignments , check for them in the respective course links shared above .

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# Month 2

**Introduction to python for data science [B]**
https://www.datacamp.com/courses/intro-to-python-for-data-science

*** Want to dive deeper into Data Visualization & Pre-Processing ? Look into Data Visualization & Pre-Processing section in miscellaneous resources . [ Highly optional ]**

**Machine Learning A-Z™: Hands-On Python & R in Data Science [B]**
Download the course from -
https://drive.google.com/drive/u/0/folders/1BtLftZRWdDnj6uc0vxNgynMvd7o9ZfCV

*** Want to explore the field of Deep Learning ? See the Deep Learning Section in miscellaneous resources . [ Highly optional ]**
*** Want to explore the field of Natural Language Processing [ NLP } ? See the Natural language Processing Section in miscellaneous resources . [ Highly optional ]**

**See how ML codes are written and made to work at - > https://github.com/maykulkarni/Machine-Learning-Notebooks or https://github.com/GokuMohandas/practicalAI/blob/master/README.md . [ Highly optional ]**

*** Find useful resources here at https://github.com/ujjwalkarn/Machine-Learning-Tutorials/blob/master/README.md . [ Highly optional ]**

**Note :**
* No weekly commitments have been set for this month as completing the courses of Month 2 requires immense concept clearing and that highly varies from person to person . Do try to finish the courses patiently with all doubts getting cleared as these form the basics for ML applications .
* If you are not able to finish the courses within Month 2 , it`s all okay . Do take your time in Month 3 and then start with projects . The coursework is independent as per your comfort .
* There are no weekly assignments for the coursework , if you want to do the assignments , check for them in the respective course links shared above .

# 100 Days Of Machine Learning ( ML ) Coursework

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# Month 3

**( Month of Projects )**

**Beginners Section [B]**
**Brush your basic concepts and revise them to start doing projects**

**1 ) Titanic Dataset**
**2 ) Iris Dataset**
**3 ) Stock Price Prediction**
**4 ) Stores Sales Forecasting**
**5 ) Housing Price Prediction**

**Guide for Beginner Projects:**

First of all see Below 2 videos to get an idea on how to make projects of Data Science and Machine Learning And then Move to Kaggle for Making your own project.Its is Good if you Make Minimum 2-3 Projects on your on own.

Titanic Survivor

Credit Card Fraud Detection

**Intermediate & Advanced Section**
**Learn libraries like Opencv , Tensorflow , SkLearn**

**1 ) Natural Language Processing : MNIST Handwritten Digit Classification**
**Twitter Sentiment Analysis**
**2 ) Email Spam Classifier**
**3 ) Fraud Detection System**
**4 ) Computer Vision : Face Recognition**
**Face Detection**

**Note :**
* It`s not necessary to do all the projects mentioned above , you may choose them as per your comfort zone and commitment . Apart from that , you can also choose a project not mentioned above . Main motive is to do things , independent of the sources !!
* Beginners , if you are fluent with the concepts by Month 2 end , you can consider picking up any 2 projects from the beginners section and then try to pick a project from Intermediate & Advanced Section .
* If you are completing the courses mentioned ( in Month 2 ) still in Month 3 , then no worries . Complete the courses fully and patiently , then try doing the projects .
* Details of the projects like what to do , how to do , datasets required etc. will be shared by the mid / end of Month 2 . Some more projects may be added and projects currently mentioned above may be removed as per the majority demands of the members .

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# Miscellaneous Resources

- **If you wanna have a look into Coursera Andrew Ng`s course , check it at https://www.youtube.com/playlist?list=PLLssT5z_DsK-h9vYZkQkYNWcItqhlRJLN .**
- **For awesome & cool Python videos , do check http://www.youtube.com/pylenin ( This channel is maintained by one of our mentors of the group ) , https://www.youtube.com/BhaveshBhatt8791**
- **Suggested notes for Month 1 ( Except Algorithms ) , download it at - https://gwthomas.github.io/docs/math4ml.pdf**

- **Deep Learning ( Do the courses as per your comfort zone )**

  MIT Introduction to Deep Learning , http://neuralnetworksanddeeplearning.com/

  Must read book on Deep Learning: Free HTML book

  Deep Learning course by Andrew Ng It has 5 courses, search them and enroll if you want to audit all the 5 courses for free.
- **Natural Language Processing ( Do the courses as per your comfort zone )**

  Introduction to Natural Language Processing UMichigan

  Natural Language Processing by Stanford

- **Practical Python Coding . Check at https://github.com/GokuMohandas/practicalAI .**
- **Check out study materials at https://www.dropbox.com/sh/ytdwn0ny0oo3qou/AADiW-0mvwxPWG1yK7HQSIxNa?dl=0 .**
- **Wanna solve assignments for the concepts learned . Try it as per the concepts you ( click on the assignment section ) - https://www.nptel.ac.in/downloads/106106139/**
- **See ML concepts implementation with Python – https://github.com/eriklindernoren/ML-From-Scratch#supervised-learning**
- **Data Preprocessing and Data Visualization**

  Data Preprocessing :

  **Numpy - (https://www.youtube.com/watch?v=rvY0MskPps0) , https://www.youtube.com/watch?v=P_3MyPMXN0Y)**

  **Pandas: (https://www.youtube.com/watch?v=Iqjy9UqKKuo&list=PLQVvvaa0QuDc-3szzjeP6N6b0aDrrKyL-) (https://www.youtube.com/watch?v=yzIMircGU5I&list=PL5-da3qGB5ICCsgW1MxlZ0Hq8LL5U3u9y)**

  Data Visualization :
  (https://www.youtube.com/watch?v=q7Bo_J8x_dw&list=PLQVvvaa0QuDfefDfXb9Yf0la1fPDKluPF)

- **ML Study Resources** : https://sgfin.github.io/learning-resources/
- **Udacity Machine Learning Engineer Course Download** : https://courseclub.net/udacity-machine-learning-engineer-nanodegree/
- **Data Science in 60 Days :** https://github.com/MeetJainAi/DataScienceIn60Days/blob/master/README.md
- **Which machine learning algorithm to choose for your problem :** https://blog.statsbot.co/machine-learning-algorithms-183cc73197c
- **To learn Tensorflow for ML :** https://github.com/Praneet460/MLCC

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- **A "weird" introduction to Deep Learning :** https://towardsdatascience.com/a-weird-introduction-to-deep-learning-7828803693b0
- **Machine Learning From Scratch** : https://github.com/eriklindernoren/ML-From-Scratch
- **Intro to Deep Learning :** https://towardsdatascience.com/a-weird-introduction-to-deep-learning-7828803693b0
- **Deep Learning Project Ideas :** https://github.com/NirantK/awesome-project-ideas
- **Best Resources for Learning & getting employed in AI/ML/DS :** https://www.linkedin.com/pulse/learning-employment-best-resources-data-science-machine-nikhil-jain/
- **Python Project Ideas for Beginners :** https://github.com/topics/beginner-project?l=python
- **Complete Guide For Titanic Survival Problem :** https://www.kaggle.com/arihant0497/complete-guide-for-titanic-survival-problem
- **How to learn ML in a self starter way :** https://elitedatascience.com/learn-machine-learning#step-3
- **For Beginner Projects :** https://elitedatascience.com/machine-learning-projects-for-beginners
- **Project Ideas :** https://www.kindsonthegenius.com/2018/11/29/10-machine-learning-project-thesis-topics-for-2019/
- **Helpful Resources :** https://brohrer.github.io/blog.html
- **Learn with Kaggle ( Kaggle Training ) :** https://www.kaggle.com/learn/overview
- **Basic ML Codes :** https://github.com/maykulkarni/Machine-Learning-Notebooks , https://github.com/nikhil-seth/ML-Models-from-scratch
- **Here are some essential math/stats for Machine Learning:**

➤ **Linear Algebra (Matrices, Vectors, Eigenvalues/Eigenvectors, Linear Transformations) Essence of Linear Algebra -** https://lnkd.in/gMzkkup

➤ **Basic Calculus (Derivatives & Integrals) Essence of Calculus -** https://lnkd.in/gDg4Nsz

➤ **Optimization (Gradient Algorithms & Objective Functions) Introduction to Optimization -** https://lnkd.in/g_e9sJu

➤ **Inferential Statistics (Distributions, CLT, Hypothesis Testing, Errors, ANOVA, Chi-Square, T-Test) Practical Guide to Inferential Stats -** https://lnkd.in/gbh3aRj

➤ **Probability Theory (Random Variables, Types of Distributions, Sampling, CI) Basics of Probability -** https://lnkd.in/gf6q8FN

➤ **Graph Theory (Trees, Nodes, Edges) Gentle Intro to Graph Theory -** https://lnkd.in/gYUgBhA

➤ **Data Structures (Algorithms, Big-O, Sorting, Time Complexity) Data Scientists Guide to Data Structures & Algorithms -** https://lnkd.in/gHZEw3d

# Things you must know

1. **Linear Algebra**: Principal Component Analysis (PCA), Singular Value Decomposition (SVD), Eigen decomposition of a matrix, LU Decomposition, QR Decomposition/Factorization, Symmetric Matrices, Orthogonalization & Orthonormalization, Matrix Operations, Projections, Eigenvalues & Eigenvectors, Vector Spaces and Norms are needed for understanding the optimization methods used for machine learning.
2. **Probability Theory and Statistics** : Some of the fundamental Statistical and Probability Theory needed for ML are Combinatorics, Probability Rules & Axioms, Bayes' Theorem, Random Variables, Variance and Expectation, Conditional and Joint Distributions, Standard Distributions (Bernoulli, Binomial, Multinomial, Uniform and Gaussian), Moment Generating Functions, Maximum Likelihood Estimation (MLE), Prior and Posterior, Maximum a Posteriori Estimation (MAP) and Sampling Methods.

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3. **Multivariate Calculus** : Some of the necessary topics include Differential and Integral Calculus, Partial Derivatives, Vector-Values Functions, Directional Gradient, Hessian, Jacobian, Laplacian and Lagragian Distribution.
4. **Algorithms and Complex Optimizations** : This is important for understanding the computational efficiency and scalability of our Machine Learning Algorithm and for exploiting sparsity in our datasets. Knowledge of data structures (Binary Trees, Hashing, Heap, Stack etc), Dynamic Programming, Randomized & Sublinear Algorithm, Graphs, Gradient/Stochastic Descents and Primal-Dual methods are needed.
5. **Computer vision** : Introduction to Computer Vision, Image Formation and Filtering: Light and Color, Image Filtering, Thinking in Frequency, Feature Detection and Matching: Edge Detection, Interest Points and Corners, Local Image Features, Feature Matching, Model Fitting
6. **Text mining** : Uses, issues and challenges, Tokenization, Text pre-processing, Document Vectors
7. **Regression, Classification and clustering** : k-NN, Naïve Bayes, decision tree, k-means, DB Scan, Training and testing (cross validation, performance evaluation methods)
8. **Some other popular domains :** Measuring similarity using various similarity measures (information retrieval),Market Basket Analysis , Web Mining, scrapping, crawling, regular expressions, Semantic Web or Topic Modelling

- **Want to upload any study material for group . Upload it at https://www.dropbox.com/request/onQMRpWhlm6l5b2uskq3 .**

## Ready to apply your machine-learning knowledge?

**Grab a data set and start solving a problem.**
**👉 Looking for a first project? Check out these 3:**
**• Iris classification -** https://lnkd.in/g8_Gx_b
**• Titanic survival -** https://lnkd.in/gsbu3yG
**• MNIST digit recognition -** https://lnkd.in/gCejAEU
**👉 Ready to go more advanced? • Check out one of the current Kaggle challenges and get started -** https://lnkd.in/gyZDbag
**👉 Got stuck?**
**• Grab a buddy and start working through the project together**
**• Draw out a visual map of what you've done and where you're stuck (trust me, this helps)**
**• Focus hard for one hour per day and then come back to the same problem the next day Don't get bogged down thinking that you need to achieve mastery before getting started. Start today and take one small step toward improving each day - you'll have more fun and make more progress that way. I promise :)**

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## So , How to learn?

"Read 500 pages every day. That's how knowledge works. It builds up, like compound interest. All of you can do it, but I guarantee not many of you will do it." — Warren Buffett

- You can go wide or you can go deep.

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- Don't chase the next shiny thing.
- Follow the relevant people.
- If you’re just off to becoming a professional developer, focus on the stuff that won’t change first.

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Pro tips to be one of the best?

- Programming Deliberately vs Programming by Coincidence
- Read all of the docs, sometimes the source code
- Never commit code you can't explain
- Search your mind deliberately → Google → Github Issues → Post to stack overflow → Ask a co-worker
- Debugging Deliberately
- Don't fix it! Reproduce It!

Be Happy ,Humble , Honest , Hungry !!

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# HAPPY LEARNING !!

## Want to apply for ML Internships , but don`t know the roadmap ?*

## Scroll down !!

***Please note that the roadmap has been prepared as per various blogs , articles ; I ( Ayon Roy ) have read about !!**

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# Machine Learning Internship Roadmap

Machine Learning is one of the fastest growing fields. Top tech companies like Google, Facebook, Amazon, Apple, and Microsoft are investing heavily in Machine Learning. For students, it is a great opportunity because not only does it open new avenues for learning but also it creates a lot of high-paying jobs and internships which the students can grab.

In this roadmap, we will talk about a step-by-step guide on how can a normal student like you get a great Machine Learning/Data Science Internship at a tech company.

This roadmap would be organized as follows:

1. Understanding the end objective
2. Preparing the basics
3. Picking up the basics of Machine Learning
4. Machine Learning project ideas
5. Building your resume
6. Interview Preparation
7. Reaching out to companies

Okay, so let us get started.

## Understanding the end objective

First, you should understand your end goal. Your aim is to get a great Data Science/Machine Learning related Internship. However, you need to refine your goal under the following areas:

1. *Timing and duration of the internship*: for how long do you wish to intern? Is it a 1-month long winter internship or is it a summer internship lasting for 3 months? Are you looking for a semester-long internship?
2. *Startup vs large organization*: are you excited to work at a startup? Or, are you looking to join a large organization? The environments, stipends, working hours are all very different in a startup as compared to a large organization. You will have to plan accordingly on what suits you the best.
3. *Paid vs unpaid*: are you fine with joining a great company where you believe that there is a huge learning potential, but may not pay you well?

The above factors are important to analyze before you start your preparation so that you can design your preparation strategy accordingly. Also, knowing the above parameters will help you refine the list of companies that you are reaching out to.

## Preparing the basics of Computer Science and Programming

It is highly recommended that you are clear with the basics of Computer Science and Programming before you jump into Machine Learning. A lot of students start to learn advanced concepts without the preparation of the very basics of Computer Science. Such students eventually face difficulties because the implementation of Machine Learning algorithms requires great programming skills. Not being fluent in Programming will make you feel handicapped while implementing Machine Learning algorithms.

Therefore, before you dirty your hands with Machine Learning, make sure to revise/prepare the following concepts:

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1. *Basics of Programming (the CS101 stuff)*: make sure that you are comfortable with at least 1 well-known programming language. It doesn't matter if it is C or C++ or Java or Python or something else. If your concepts are right, it is easy to pick up any new programming language. Revise the fundamentals of loops, variables, constants, functions, classes and objects.
2. *Calculus*: Machine Learning involves a lot of concepts from multivariate Calculus. Not knowing these concepts would make you feel that "ML is a black box" - which obviously you don't want. Therefore, you should revise Calculus thoroughly. In particular, make sure you are familiar with the concepts of Differential Calculus. Coursera's course on Mathematics for Machine Learning: Multivariate Calculus is excellent for picking up Calculus.
3. *Linear Algebra*: Linear Algebra is heavily used in Machine Learning. Some algorithms like PCA involve heavy use of Eigenvalues and Eigenvectors. Most students take Linear Algebra lightly and skip the advanced portions. They eventually face challenges in understanding ML algorithms. Coursera's course on Mathematics for Machine Learning: Linear Algebra is great.
4. *Probability and Statistics*: You should be absolutely comfortable with the theory of Probability before you start Machine Learning. Probability and Statistics course offered by MIT OCW is something you should definitely give a try.

For Machine Learning, it is highly recommended that you use Python as the programming language. Python has excellent libraries for Machine Learning and it integrates well with quite a few web-frameworks. For learning Python, you can take Introduction to Python Programming course offered by Udacity.

Once the basics are in place, you would find it far easier to understand the concepts of Machine Learning. Having done the above, you'd be in a position to start with the core ML concepts.

### Picking up the basics of Machine Learning

By far, the best known introductory course on Machine Learning is Andrew Ng's Course on Coursera. The course is an excellent mix of theory and programming and would give you a first-hand experience at ML. There is just 1 major drawback - the course uses Octave as the programming language which for all practical purposes is not used in the industry. Most companies, including startups, rather use Python for ML.

But that isn't an issue. When taking Andrew Ng's course, you can parallelly implement the algorithms in Python as well. To start off with, you can use the Scikit learn library in Python which is one of the easiest to learn and implement. Sckiti learn offers readymade implementations of a large number of Machine Learning algorithms.

Some of the key concepts that you should focus on as a part of the course are:

1. Supervised vs unsupervised learning: a lot of companies ask basic questions on this topic during the interviews.
2. Difference between Regression and Classification
3. Backpropagation in Neural Networks

At the end of the course, you'd be able to implement Machine Learning algorithms on simple datasets which is quite good to grab an internship.

### Machine Learning project ideas

As soon as you complete Andrew Ng's course, one of the most important things that you should do is to aim for at least 1 decent project in Machine Learning. Putting a great project on your resume is sure to give you an edge.

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Many students worry about project “validation”. You should understand 1 important point - most companies don’t care about the “validation” of your project. Basically, you need not necessarily show that you did the project under a professor. You can always take up a project on your own and put it on your resume. At the very most, the interviewer might want to verify if you are lying or not. They always have a simple way to check this - ask you questions. In fact, that’s what most interviewers do - they ask you questions about your projects that you have mentioned on your resume.

Therefore, having some great Machine Learning-based projects on your resume gives you a great opportunity to create that “story” in front of your interviewer. You can talk about how you implemented your project, the concepts that you learnt and the scope of improvement. These things help you stand out of your competitors.

To get some great project ideas on Machine Learning, you can visit Kaggle. Kaggle contains a large number of datasets on which you can implement your own algorithms. Google has also launched a repository of ML Datasets. Each dataset is a project opportunity for you.

There is also a great course by Eduonix on Learning Machine Learning by Building Projects.

While doing a project, focus on the following key points:

1. How did you clean the data in the particular dataset
2. Why did you choose a particular Machine Learning algorithm for that dataset
3. What metrics have you used to evaluate the performance of the algorithm
4. How does the performance get impacted if you use some other algorithm?

Basically, aim to create a 1 - 2 page long report which highlights these points. It would be great to carry a printout of this report during your interview.

### Building your resume

The first step in cracking a great Machine Learning internship is to get your resume shortlisted by some top companies you are aiming for. Generally speaking, resumes are screened by recruiters of the company. Recruiters often do not have the technical knowledge and therefore, they look for “keywords” on your resume. These keywords are highlighted in the form of skills, projects and certifications.

For instance, under the skills section, you should mention "*Machine Learning*" and "*Data Science*".

Under the projects section, you can add something like this: *implemented a Neural Network which predicts _____ with an accuracy of __%. The implementation was done using Scikit learn library in Python*.

Under the certifications section, you should mention any certificates that you may have obtained in Machine Learning. *Obtained a certificate of Machine Learning course completion by Coursera’s Machine Learning class*.

Interview Preparation

When preparing for the interviews, divide your preparation into 2 parts

1. Preparing for Non-Machine Learning based interview
2. Preparing for Machine Learning based interviews

It is highly likely that even if you are applying for a core-Machine Learning company, they will have a round of screening which evaluates you on your basic knowledge of Data Structures and Algorithms, Python programming, Operating Systems and related fundamentals.

The last thing that you would want is that after 3 months of Machine Learning preparation you are rejected during the screening round which has nothing to do with Machine Learning.

Therefore, preparation for non-Machine Learning based interviews and screening tests is equally important. To do so, you should aim for the following:

1. Practice some simple implementation based problems, primarily on arrays, trees and Dynamic programming - these are most common in screening tests
2. Revise the concepts of Operating Systems and a bit about Databases as well
3. Recall all of the concepts involved in various projects that you've mentioned on your resume, by it ML projects or be it non-ML projects - remember, interviewers can pick up anything.

Often, the companies carry out a generic hiring process and then depending on the skills and projects mentioned on the candidate's resume, they shift the candidate to a specific position (like Machine Learning Engineer Intern). Make sure that you are able to crack the generic hiring process by revising the concepts mentioned above.

For Machine Learning interview preparation, you should revise all the projects that you've mentioned on your resume. Besides, you should review Andrew Ng's course quickly so that all the algorithms and related concepts are fresh in your mind.

### Reaching out to companies

A great platform to reach out to startups and middle stage companies is AngelList. Create a proper AngelList profile, highlighting your education, courses, skills and most importantly, the projects in chronological order. Add a decent profile image. Recruiters tend to skip profiles without an image - often thinking it to be a fake profile. Add a professional photograph. Do not add a casual picture with your friends.

Now, you can use AngelList to filter roles and companies by location, and even skills. For instance, you can filter all companies that are hiring for Machine Learning or Data Science.

You should post about your projects on LinkedIn so that the audience can see your progress and potential recruiters can reach out to you. Make a decent LinkedIn profile and connect to recruiters of the companies that you found on AngelList. Drop them a polite message, attaching your resume

*Dear X,*

*My name is Y and I am a 3rd-year Computer Science student at PQR college. I am glad to be connected with you on LinkedIn.*

*I am very passionate about the domain of Machine Learning and for the past 3 months, I have been working hard to develop my skills around it. I believe that your organization could be a great opportunity for me to improve my skills and at the same time, create value for your company by working on your backend Machine Learning infrastructure.*

*I would be glad if you could kindly consider my resume for a position of a summer internship for 3 months, starting 1st of May, 2019.*

*Looking forward to hearing from you.*

*Thanks,*
*Name ( Ayon Roy )*
*B.Tech 2nd year*
*Computer Science and Engineering*
Guru Gobind Singh Indraprastha University , Delhi

After a week or so, if they have seen your message but not replied, you could drop a gentle follow-up message something like this:

*Dear X,*

*I hope you got a chance to see my last message. I was wondering if there is something else you need from my end which will help you consider my candidature.*

*Thanks and Kind Regards,*
*Name ( Ayon Roy )*
*B.Tech 2nd year*
*Computer Science and Engineering*
Guru Gobind Singh Indraprastha University , Delhi

Aim to reach out to at least 10 - 20 decent companies. Assuming a success rate of 50%, you'd hear back from 5 - 10 of them for the interview.

## Conclusion

Learning Machine Learning and cracking a great internship is easy. All that is needed is that you create a systematic plan and execute it. Unfortunately, Tier 2 and Tier 3 college students do not get much attention from the companies and so, if you are from one such college and are looking for a top internship, you should aim to differentiate yourself. Your resume and your skills should be that key differentiator. Aim to create a superb resume which will help you catch the eyes of the companies. Increase your visibility to recruiters by being active on LinkedIn and AngelList.