Title: 6-Month Learning Roadmap to Become an ML Researcher (For Beginners)

Week 1-2: Introduction to Machine Learning

- Module 1: Understanding Machine Learning
    - Resource: [Coursera's Machine Learning Course by Andrew Ng](https://www.coursera.org/learn/machine-learning) (2 hours)
    - Resource: [Stanford's Machine Learning (Andrew Ng)](https://www.youtube.com/watch?v=v-180yaD04c&ab_channel=Stanford) (2 hours)

Week 3-4: Mathematics for Machine Learning

- Module 2: Linear Algebra
    - Resource: [3Blue1Brown's Linear Algebra Playlist](https://www.youtube.com/playlist?list=PLZHQObOWTQDPD3MizzM2xVFitgF8hE_ab) (3 hours)
    - Resource: [Khan Academy's Linear Algebra Course](https://www.khanacademy.org/math/linear-algebra) (2 hours)

Week 5-6: Probability and Statistics

- Module 3: Probability Theory
    - Resource: [Khan Academy's Probability Course](https://www.khanacademy.org/math/statistics-probability/probability-lib) (3 hours)
    - Resource: [Probability and Statistics for Machine Learning by Princeton University](https://github.com/datascienceorg/ds100-probabilistic-machine-learning) (2 hours)

Week 7-8: Python for Machine Learning

- Module 4: Python Basics

- Resource: [Python for Everybody (CS109) by University of Michigan](https://www.py4e.com/) (3 hours)

- Resource: [Python Data Structures and Algorithms](https://www.codecademy.com/learn/learn-python-3-thinking-computationally) (2 hours)

Week 9-10: Introduction to Data Analysis

- Module 5: Data Manipulation (Pandas)

- Resource: [Pandas for Data Analysis (Python) - DataCamp](https://www.datacamp.com/courses/pandas-foundations-for-data-analysis-in-python) (3 hours)

- Resource: [Pandas Tutorials by Real Python](https://realpython.com/pandas-dataframe/) (2 hours)

Week 11-12: Introduction to Machine Learning Libraries

- Module 6: Scikit-learn

- Resource: [Scikit-learn: Machine Learning in Python](https://scikit-learn.org/stable/tutorial/index.html) (4 hours)

- Resource: [Scikit-learn from Novice to Practitioner](https://www.datacamp.com/courses/scikit-learn-from-novice-to-practitioner) (3 hours)

Week 13-14: Supervised Learning

- Module 7: Regression and Classification

- Resource: [Supervised Learning with Scikit-learn](https://scikit-learn.org/stable/tutorial/statistical_learning/supervised_learning.html) (4 hours)

- Resource: [Python Machine Learning - Classification and

Regression](https://www.datacamp.com/courses/python-machine-learning-classification-and-regression) (3 hours)

Week 15-16: Unsupervised Learning

- Module 8: Clustering and Dimensionality Reduction
  - Resource: [Unsupervised Learning with Scikit-learn](https://scikit-learn.org/stable/tutorial/clustering/index.html) (4 hours)
  - Resource: [Data Visualization and Clustering with Python](https://www.datacamp.com/courses/data-visualization-and-clustering-with-python) (3 hours)

Week 17-18: Neural Networks and Deep Learning

- Module 9: Deep Learning Basics
  - Resource: [Deep Learning Specialization by Andrew Ng](https://www.coursera.org/specializations/deep-learning) (7 hours)
  - Resource: [Deep Learning for Beginners - FreeCodeCamp](https://www.freecodecamp.org/news/deep-learning-for-beginners-understanding-neural-networks-and-backpropagation-a-step-by-step-explanation-with-python-code-3147b1c83e1e/) (4 hours)

Week 19-20: Research Project

- Module 10: Applying Machine Learning Techniques to Real-world Data
  - Resource: [Kaggle](https://www.kaggle.com/) (7 hours)
  - Resource: [Google's TensorFlow Playground](https://playground.tensorflow.org/) (3 hours)

Week 21-22: Machine Learning Best Practices and Ethics

- Module 11: Machine Learning Best Practices

- Resource: [Best Practices for Machine Learning Engineering](https://datascience.stackexchange.com/questions/16461/best-practices-for-machine-learning-engineering) (2 hours)
- Resource: [Practical Machine Learning Projects with Python](https://www.datacamp.com/courses/practical-machine-learning-projects-with-python) (3 hours)

- Module 12: Machine Learning Ethics
  - Resource: [Ethics in AI](https://www.edx.org/professional-certificate/ethics-artificial-intelligence) (2 hours)
  - Resource: [AI Ethics: A Primer for the Age of Artificial Intelligence](https://www.amazon.com/AI-Ethics-Primer-Artificial-Intelligence/dp/1949199414) (1 hour)

Week 23-24: Final Project and Assessment

- Module 13: Final Machine Learning Project
  - Resource: [Kaggle](https://www.kaggle.com/) (7 hours)
  - Resource: [Capstone Project](https://www.datacamp.com/community/projects) (7 hours)
- Module 14: Assessment and Feedback
  - Resource: [Project Review](https://www.linkedin.com/learning/machine-learning-projects-for-beginners/project-review) (1 hour)
  - Resource: [Code Review](https://www.reddit.com/r/MachineLearning/wiki/datasets#wiki_datasets_for_code_review) (1 hour)

Week 25: Preparation for the Future

- Module 15: Continuous Learning
    - Resource: [Recommended Reading for Machine Learning](https://www.oreilly.com/learning/machine-learning-books-for-humans) (1 hour)
    - Resource: [Top AI and Machine Learning Blogs](https://towardsdatascience.com/top-ai-and-machine-learning-blogs-to-follow-in-2021-75a9c6053d60) (1 hour)
- Module 16: Networking and Community Engagement
    - Resource: [Machine Learning Subreddits](https://www.reddit.com/r/MachineLearning/) (1 hour)
    - Resource: [Machine Learning Meetups](https://www.meetup.com/topics/machine-learning/) (1 hour)