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# Python machine learning tutorial with examples

Photo Courtesy: Christian Science Monitor/Getty Images Modern society is built on the use of computers, and programming languages are what make any computer tick. One such language is Python. It's a high-level, open-source and general-purpose programming language that's easy to learn, and it features a broad standard library. Guido van Rossum developed it in 1991, and it still sees plenty of use today. Python is designed for automated memory maintenance, the implementation of basic concepts of object-oriented programming (OOP) and developing programming paradigms. You can also use it to establish frameworks, like Pyramid and Django, or high-level content management systems, like Plone and Django CMS. If all this sounds complicated, don't worry. The following Python tutorials are designed for people who don't know anything about the language as well as those with more experience. These are some of the best tutorial platforms for learning Python on your own. The Python Software Foundation Who better to learn the Python programming language from than the organization that continues to maintain it? Python.org is the official website of the Python Software Foundation, and it has a wonderful tutorial for anyone looking to either learn the basics of the language or familiarize themselves with more advanced features. Photo Courtesy: MediaNews Group/Orange County Register via Getty Images/Getty Images Interested in learning what mutable and immutable objects (MIO)? Python enhanced proposals (PEP)? Generators and iterators entails? The tutorial has you covered. As you gain experience, you'll be able to advance to other topics like Python libraries. Learn Python the Hard Way "Learn Code the Hard Way" definitely doesn't have the most inviting name, but it's actually a popular and easy-to-use online platform for learning programming, including how to use Python. Other programming languages you can learn about on the site include JavaScript, C, SQL and more. Photo Courtesy: Bloomberg/Getty Images Topics you can expect to learn about include functions, strings and text, classes and objects and variables and names. While full courses cost \$20 to \$30 each, the first portion of each course is available for free online, which can be enough for many users. Either way, once you've completed the free content, you'll likely know if the full course is something you want to spend money on. Coursera Coursera is a great website for learning about basically anything. While most courses are not free, they're significantly cheaper than attending a university (roughly \$30 to \$100 a month), and many can be audited for free. Without paying anything, you get access to most or all course materials, including videos and readings. The site also offers videos in multiple languages, including English, Chinese, French, Russian, Spanish and others. Subtitles in more languages are also available. Photo Courtesy: Bloomberg/Getty Images You can find courses on Python (among other programming languages) that are appropriate for learners of nearly ever levels. From Python for Data Science and A.I. to a class that's literally called Python for Everybody offered through the University of Michigan, there's no shortage of options. UdeMyLike Coursera, UdeMy courses on a range of subjects. With topics ranging from advanced Python features like timestamps and decorators to basic coding exercises, the education platform can propel you from beginner to expert in no time. While only a few courses are free, most are fairly cheap, and sales are frequent. Photo Courtesy: SOPA Images/Getty Images Start your preferred Python course by signing up for an account on the platform. You'll receive a certificate of completion upon completing the entire course. Options include Introduction to Python Programming, Learn Python 3.6 for Total Beginners and Python for Absolute Beginners. More advanced courses for Python 2.0 and Python 3.0 as well as Python REPL also exist. Codecademy More than 45 million students have learned programming languages through Codecademy, and the education company has continued to emphasize the importance of developing diverse coding skills as well as the overall learning experience. Codecademy was established in 2011 and has emerged as the go-to online learning platform for free coding classes. Photo Courtesy: MediaNews Group/Orange County Register via Getty Images/Getty Images The company has several courses that cover the full range of Python skills. Like Coursera, while certificates, step-by-step support and other features require a Codecademy subscription, interactive lessons and daily practice are free. You can also use the free code editor and access the community discussion forums to discuss lessons with other learners. MORE FROM QUESTIONSANSWERED.NET By Bernd Klein. Last modified: 17 Feb 2022. Machine Learning Machine learning is the kind of programming which gives computers the capability to automatically learn from data without being explicitly programmed. This means in other words that these programs change their behaviour by learning from data. We will cover various aspects of machine learning in this tutorial. Of course, everything will be related to Python. So it is Machine Learning by using Python. It might well be that you came to this website when looking for an answer to the question: What is the best programming language for machine learning? Python is clearly one of the top players! We will cover in this tutorial on Machine Learning and Python the following topics amongst others: k-nearest Neighbor Classifier Neural networks Neural Networks from Scratch in Python Neural Network in Python using Numppy Dropout Neural Networks Neural Networks with Scikit Machine Learning with Scikit and Python Naive Bayes Classifier Introduction into Text Classification using Naive Bayes and Python Machine learning can be roughly separated into three categories: Supervised learning The machine learning program is both given the input data and the corresponding labelling. This means that the learn data has to be labelled by a human being beforehand. Unsupervised learning No labels are provided to the learning algorithm. The algorithm has to figure out the a clustering of the input data. Reinforcement learning A computer program dynamically interacts with its environment. This means that the program receives positive and/or negative feedback to improve its performance. Learn theory, real world application, and the inner workings of regression, classification, clustering, and deep learning. What you will need for this tutorial series: install numpy, matplotlib, pandas, sklearn and their dependencies pip install numpy pip install scipy pip install scikit-learn pip install matplotlib pip install pandas Need help installing packages with pip? see the pip install tutorial Hello girls and guys, welcome to an in-depth and practical machine learning course. The objective of this course is to give you a holistic understanding of machine learning, covering theory, application, and inner workings of supervised, unsupervised, and deep learning algorithms. In this series, we'll be covering linear regression, K Nearest Neighbors, Support Vector Machines (SVM), flat clustering, hierarchical clustering, and neural networks. For each major algorithm that we cover, we will discuss the high level intuitions of the algorithms and how they are logically meant to work. Next, we'll apply the algorithms in code using real world data sets along with a module, such as with Scikit-Learn. Finally, we'll be diving into the inner workings of each of the algorithms by recreating them in code, from scratch, ourselves, including all of the math involved. This should give you a complete understanding of exactly how the algorithms work, how they can be tweaked, what advantages are, and what their disadvantages are. In order to follow along with the series, I suggest you have at the very least a basic understanding of Python. If you do not, I suggest you at least follow the Python 3 Basics tutorial until the module installation with pip tutorial. If you have a basic understanding of Python, and the willingness to learn/ask questions, you will be able to follow along here with no issues. Most of the machine learning algorithms are actually quite simple, since they need to be in order to scale to large datasets. Math involved is typically linear algebra, but I will do my best to still explain all of the math. If you are confused/lost/curious about anything, ask in the comments section on YouTube, the community here, or by emailing me. You will also need Scikit-Learn and Pandas installed, along with others that we'll grab along the way. Machine learning was defined in 1959 by Arthur Samuel as the "field of study that gives computers the ability to learn without being explicitly programmed." This means imbuing knowledge to machines without hard-coding it. From what I have personally found, people outside the programming community mainly believe machine intelligence is hard-coded, completely unaware of the reality of the field. One of the largest challenges I had with machine learning was the abundance of material on the learning part. You can find formulas, charts, equations, and a bunch of theory on the topic of machine learning, but very little on the actual "machine" part, where you actually program the machine and run the algorithms on real data. This is mainly due to the history. In the 50s, machines were quite weak, and in very little supply, which remained very much the case for half a century. Machine Learning was relegated to being mainly theoretical and rarely actually employed. The Support Vector Machine (SVM), for example, was created by Vladimir Vapnik in the Soviet Union in 1963, but largely went unnoticed until the 90s when Vapnik was scooped out the Soviet Union to the United States by Bell Labs. The neural network was conceived in the 1940's, but computers at the time were nowhere near powerful enough to run them well, and have not been until the relatively recent times. The "idea" of machine learning has come in and out of favor a few times through history, each time leaving people thinking it was merely a fad. It is really only very recently that we've been able to put much of machine learning to any decent test. Nowadays, you can spin up and rent a \$100,000 GPU cluster for a few dollars an hour, the stuff of PhD student dreams just 10 years ago. Machine learning got another up tick in the mid 2000's and has been on the rise ever since, also benefitting in general from Moore's Law. Beyond this, there are ample resources out there to help you on your journey with machine learning, like this tutorial. You can just do a Google search on the topic and find more than enough information to keep you busy for a while. This is so much so to the point where we now have modules and APIs at our disposal, and you can engage in machine learning very easily without almost any knowledge at all of how it works. With the defaults from Scikit-learn, you can get 90-95% accuracy on many tasks right out of the gate. Machine learning is a lot like a car, you do not need to know much about how it works in order to get an incredible amount of utility from it. If you want to push the limits on performance and efficiency, however, you need to dig in under the hood, which is more how this course is geared. If you are just looking for a quick tutorial for employing machine learning on data, I already have a simple classification example tutorial and a simple clustering (unsupervised machine learning) example that you can check out. Despite the apparent age and maturity of machine learning, I would say there's no better time than now to learn it, since you can actually use it. Machines are quite powerful, the one you are working on can probably do most of this series quickly. Data is also very plentiful lately. The first topic we'll be covering is Regression, which is where we'll pick up in the next tutorial. Make sure you have Python 3 installed, along with Pandas and Scikit-Learn. The next tutorial: Regression - Intro and Data

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