Machine Learning with Python
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IBM builds up this course to structure the organized flow of sessions in helping learners know what machine learning is and how to apply this to the different fields people participate in the real world with well-known programming language Python. This course is divided into six sessions and they do provide lessons to assist us with the understanding of how to enhance our skills to be able to use machine learning for real-life application. Since wanting to be a professional AI engineer or simply being interested in what kind of discipline AI includes could be evident to the heart of an individual, machine learning with Python would be a necessary pick for essential reasons such as the relevance to the knowledge of AI.

This is the course which offers me so many learning opportunities about the programming of Python and the skills that are taken in the scope of machine learning for the wider scene of artificial intelligence. Before entering this course, I do not have any idea about what I could learn from the topic like machine learning since it seems so abstract to me. Even though it makes sense of knowing what it is, how to apply it and make it happen troubles me. Generally, I can break it down into three main topics such as supervised learning vs. unsupervised learning, model evaluation, and machine learning algorithms. After finishing learning all of these, I have gained a hands-on utility to use each different skill applied on a real-life project, and find out which one of the skills could be considered as the best classifier. Therefore, in this case, I have the opportunity to practice all the classification algorithms that have been previously learned in this course.

In the introduction of machine learning, I have learned the applications of it could occur in different fields such as health care, banking, telecommunication, and so on. I also have gotten a general overview of machine learning topics such as supervised vs unsupervised learning, and the usage of each algorithm. Meanwhile, I have had a chance to take advantage of using Python libraries, which give me a collection of functions and methods that allows anyone to perform many actions without writing any code, for implementing machine learning models. In the light of the concept of machine learning, it’s like a human being instructing a machine in order to accomplish a predictable and reasonable outcome without circumventing the real route for retaining the learning and manifesting the growing capacity to do tasks. For instance, as a machine learning model iteratively learns from data, it helps a computer to find hidden insights. Also, it creates multiple jobs such as object recognition, summarization, and recommendation. Lastly, by writing down rules and methods and being explicitly programmed, it gives a computer the ability to make decisions. It’s like my mentor is able to frame a way with a couple personal counsels in order to direct my thinking to make a final legitimate decision or take a logical next step, probably.

The second session of this course is regression, which displays the analysis, showing a set of statistical processes for estimating the relationships between a dependent variable and one or more independent variables. In this case, learning about linear, non-linear, simple and multiple regression, and their applications is unavoidable. In the applications on datasets, there

are several examples that we are able to use for the understanding of regression. In order to predict the price of a house in an area, we can take its size, number of bedrooms, or others to attain adequate price estimation. As for employment income, we can consider hours of work, education, occupation, sex age, years of experience, and others to be our proper independent variables. Certainly, there are more real-life examples of using the method of regression as a helpful guide, such as sales forecasting and satisfaction analysis that can be good demonstrations of predicting the outcome based on clear, reasonable independent variables. Therefore, by using regression, predicting continuous values is the end goal. And this is the very first technique I do learn from the area of machine learning.

Next, this course provides seven different classification methods that are capable of applying their algorithms on various datasets to solve real world problems. They are k-nearest neighbors (which also can be used for regression), decision trees, Naïve Bayes, linear discriminant analysis, logistic regression, neural networks, and support vector machine (SVM). In this scenario, predicting the item class/category of a cause is the result of this type of technique. For the final capstone project, I am asked to apply several classification methods with machine learning algorithms on the data to do prediction on whether a loan case will be paid off or not. K-nearest neighbors, decision tree, support vector machine (SVM), and logistic regression are main algorithms to build my models by Python on the notebook in IBM Watson Studio, which helps data scientists and analysts prepare data and build models at scale across any cloud. In the end, I could judge which one is the best classifier based on this assignment, along with the outcome of the accuracy of each classifier, using the value of Jaccard index, F1-score, and Log Loss when these are applicable, and these are clearly shown in the file as well.

After the sessions of regression and classification, now the next thing I gain is to learn about different clustering approaches. This course provides three different types of clustering algorithms: partitioned-based clustering (k-means clustering in this case), hierarchical clustering, and density-based clustering. For example, in the method of k-means clustering, buying patterns of customers is identified or new books or movies to new customers is recommended is the application of it. There would be data information about the frequency of customers' buying choices and other sufficient sets to help frame the idea of the movement from each particular selled item. Definitely, there are other examples as well, such as fraud detection in credit card use, articles recommendation, characterizing patient behavior in the context of medicine, and so on.

Lastly, recommender systems are introduced, and they are categorized into two main types that are discussed in the course: they are content-based and collaborative filtering. Basically, the general purpose of the recommender system is to capture the pattern of people's behavior and use it to predict what else they might want or like. When shopping online to look at the webpage about books, movies, beers, shoes, and others, people will simultaneously think of

what they should buy. On social media websites such as Linkedin and Facebook, they will automatically ask people of who they should be friends with. With the establishment of assisting people to fastly make a choice, these can be good suggestions. But at the same time, I think personal awareness and consciousness need to be addressed as well due to the lack of intimate personal comprehension of machines to human beings.

Therefore, the emphasis about how to use machine learning tools is vitally important, since it is so close to home and the influence of technological advancement cannot be possibly rejected. With that in mind, we as humans ought not to be dominated by their usefulness, instead we ought to corroborate with them advantageously without destruction in any shape or form. By the way to get through life with so many helpful assessing tools of machine learning ideas for efficient and convenient living, I do hope that this AI technique will not minimize our ability to think about how to use it correctly and realistically and other issues that are closely aligned with our everyday lives. Ultimately, this course has informed me with sufficient knowledge about machine learning and made me ponder deeply about how I can practically apply it for the good of the society.