Deep walk on Azure Machine Learning – Why on Cloud and that too on Azure!!

Introduction:

This article goes up with a deep walk on Azure Machine Learning covering the topics with lot many modules which heads up with loading data in azure machine learning, data preparation, azure machine learning modelling, deploying the models and about r scripts in Azure.

Welcome to Azure Machine Learning:

Days were there where we were helping folks on developing software's to automate things, the next era started about thinking on how to solve the existing problems that we have in real times of our life and as it went on we came up with a great technology which started predicting with Artificial Intelligence to give up the solution for the problems, to respond back as a Bot, to keep your data secured and recognise as a Cognitive Service, etc.,

One such emerging trend that we have today to give up solution using the available data sets is nothing but "Machine Learning". Machine Learning is one powerful predictive technology that has come up with solutions for existing problems and the result of the solution cannot be 100% perfect but the way that it predicts is more over the right solution for the problem. The accuracy for the solution depends on how perfect the data sets matches the current problem scenario. Machine Learning is a common factor that maximum of IT giants work today like Microsoft with Azure Machine Learning Studio, Google on Machine Learning solutions as Cloud Machine Learning Engine, etc.,

So that's a wrap mixing up things together for a better start about Azure Machine Learning!! Here my writing will be completely on Azure Machine Learning Studio.

Why Machine Learning in Cloud?

Machine Learning can be executed at any environment either with the computation at on-premise or at cloud but maximum of giants today who work to come up with a solution on Machine Learning works only with cloud and namely its Azure Machine Learning or Google Cloud Machine Learning Engine! So, thinking about this in detail we get charged up with strong valid points that stands up and certainly when we speak about Azure Machine Learning Services.

Here are the points which considers about it:

- **Integration:** Azure Machine Learning is put up as a wrap where we can work with workflow of Azure ML Studio as added up the designers of drag and drop which makes things to be much simple, this also helps us in feature processing and integrating the same Azure Machine Learning models with Azure Storage.
- **Scalability:** Azure Machine Learning helps us to go with any matter of solution subjected to small scale or a larger scale one ranging from just a normal developer to data scientists who work to come up with a solution on their models. We have a good scalability on Azure ML which can come up with 20 default endpoints and it can scale upto 200 concurrent requests per endpoint, the ML solution can also be deployed as a PaaS application on azure as web service application. We can also spread the jobs across the nodes and scalability also works in

getting larger datasets samples using Hive queries, Azure SQL Database queries, etc., between scalability doesn't support on scaling the size of virtual machines that runs the web service.

- **Discover and share experience:** Azure Machine Learning helps us in understanding the business goals, discover and gather data, ingest data, understand the data, transform it, create the model, deploying the model, monitor and maintain the model, respond to the changes in the model as debugging it and enhancing it followed by sharing the results with business owners as apps or web services, etc., Azure Machine Learning also helps us in sharing the models and experiments using the Cortana Intelligence Gallery which explores the predictive analytics experiments built by Microsoft Engineers and other data science community.
  Ref - https://gallery.cortanaintelligence.com/solutions

- **Notebook Developer Experience –** Azure Machine Learning supports us with Notebook Developer Experience with workbench, command line interface by which we can work from any machines and any platforms just by the URL - http://studio.azureml.net/ further development can also be lead using Powershell on both new and classic modes followed by REST API reference and web service error codes.

- **Portable Models –** Azure Machine Learning provides portability with best open source frameworks like TensorFlow, Cognitive ToolKit, Spark ML, etc., also helps us to go with model management and Visual Studio Code Tools for Artificial Intelligence and deploy the model as a web app or as a Universal Windows Platform App.

Why Machine Learning in Microsoft Azure?

"Microsoft & Machine Learning – Long in touch.."

Starting from the period of 1999, Microsoft started working on Machine Learning to help the users on computers to work with filtration at junk mails in inboxes, example – Windows Live Hotmail. In 2004, Microsoft Search Engine "Bing" was built using Machine Learning followed up by 2005 for "Microsoft SQL Server" which enables the data mining for databases, by 2008 traffic prediction service was built on "Bing Maps" using azure machine learning, by 2010 users questers were predicted by Microsoft Kinect, by 2012 "Skype Translator" was built in for speech-to-speech translation using Azure Machine Learning, by 2014 Microsoft has come up with Microsoft Machine Learning to make innovations joining the hands of all common developers using Cortana Intelligence Gallery.

- **Fully Managed -** Microsoft Azure helps us in fully managed services where we no need to install any software, no hardware maintenance, it just helps us to go with one point of communication which is Azure Portal – http://portal.azure.com

- **Integration –** Azure Machine Learning just goes with simple integration as drag and drop to connect with the interface for the data. Azure Machine Learning helps the developers in such a way that we no need to worry about the programming languages for basic tasks.

- **Best in Class Algorithms –** Azure Machine Learning again supports us with built in collection for best algorithms and it provides support for R and other popular packages.

- **Deploy in short time –** We can just cross check the models, trained methods and everything leading up to the deployment status with just a few minutes of work. We can operationalise the models as a web app or as a UWP app in easy steps, Azure ML also helps us in setting up your model in gallery for others to help with what you have built,

simply make money with Machine Learning Marketplace from free workspace on Azure Machine Learning. Example - http://how-old.net/

Start with Azure Machine Learning Service:

"Data | Predictive Model | Operational Web API in minutes"

Azure Machine Learning Service can help getting the data from Blobs and Tables, Hadoop (HDInsight) from Relational Databases using Azure SQL Database and integrate them with the Machine Learning Development Environment using Azure Machine Learning Studio and make the model available for the client as a web app or as any forms of accessibility supporting all sort of devices like phones, tabs and PC's.

The Machine Learning Studio from Microsoft Azure supports us with visual editor for composing, testing, refining and deploying ML models which includes hundreds of modules, includes common algorithms for classification, regression and more. Azure ML studio also supports for number of input formats followed by the support for R and Python. Machine Learning provides many algorithms classified into groups as anomaly algorithms, classification, clustering and regression.
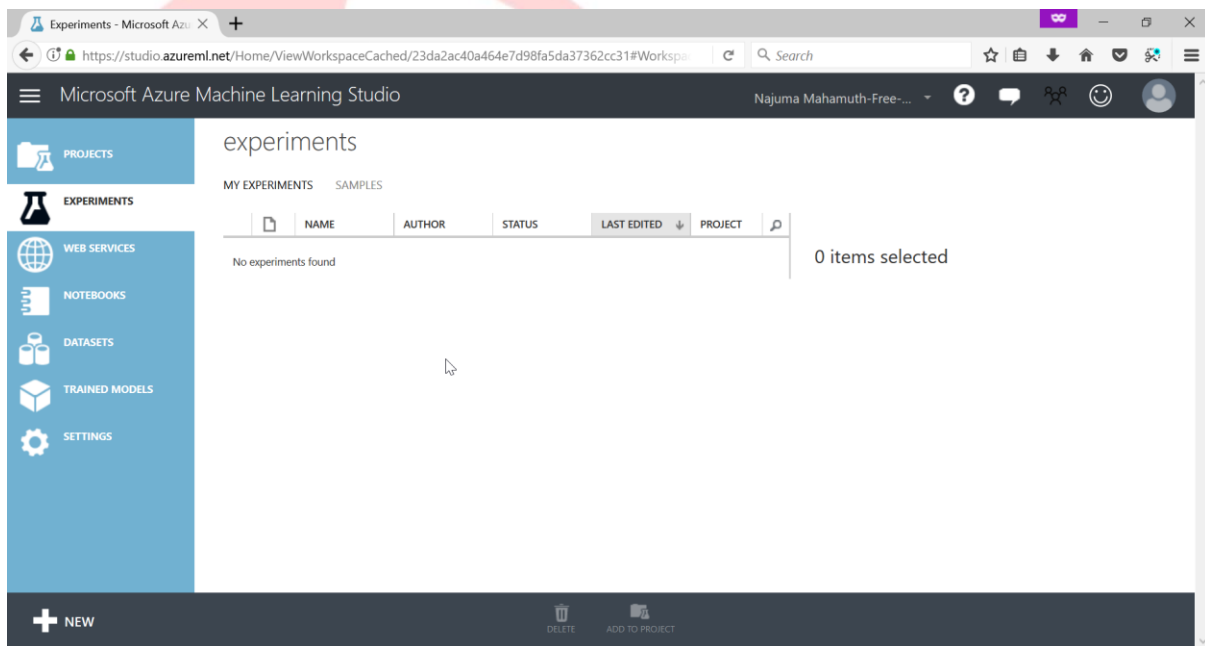
Anomaly detection is the identification of items, events, or observations which do not conform to an expected pattern or other items in a dataset. A classic example is examining a dataset representing banking transactions and detecting potentially fraudulent transactions in that group.

Regression algorithms seek to establish and quantify relationships between variables. By establishing a relationship between a dependent variable and one or more independent variables, regression analysis can enable the value of a dependent variable to be predicted given a set of inputs with a quantifiable accuracy. A great example can be seen at https://how-old.net/#, a site that lets you upload a photo and then guesses your age with uncanny accuracy. The site uses Azure Machine Learning and combines classic regression with advanced image recognition.

The purpose of classification algorithms is to identify the category to which an observation belongs based on training data consisting of observations which have already been classified (assigned to a

category). A great example is determining whether an e-mail belongs to the "spam" category or the "not-spam" category.

Clustering seeks to group a set of objects in such a way that objects in the same group (called a cluster) are more similar to each other than to those in other groups (clusters).

Check for the Algorithm Cheat sheets over here - http://aka.ms/MLCheatSheet

Summary:

Hope this writing would have helped you in understanding the basics of Machine Learning, why we should perform it on cloud and that too with azure cloud with all possibilities that we have from Azure Machine Learning Studio classifying the algorithms.

Follow up my next writing on getting started with Azure Machine Learning Studio to work and a brief introduction for Azure Storage.