CLOUD COMPUTING APPLICATIONS

Cloud Machine Learning: Cloud Providers

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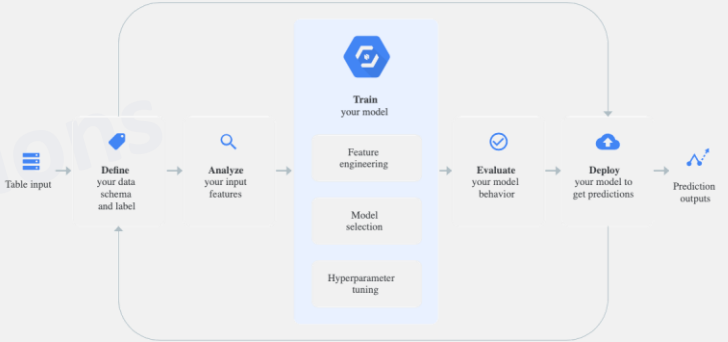
Cloud Based Machine Learning

- ML frameworks on virtual machines
  - Pre-built images
  - Tensorflow
  - MXNet
  - Mahout
- Cloud Managed platforms

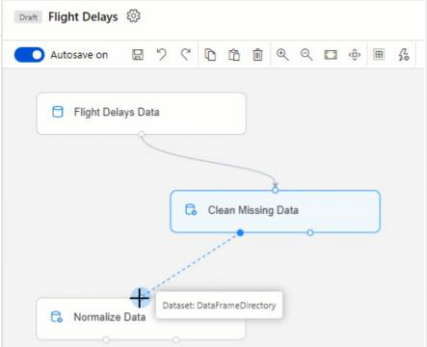
Google Cloud AI Platform

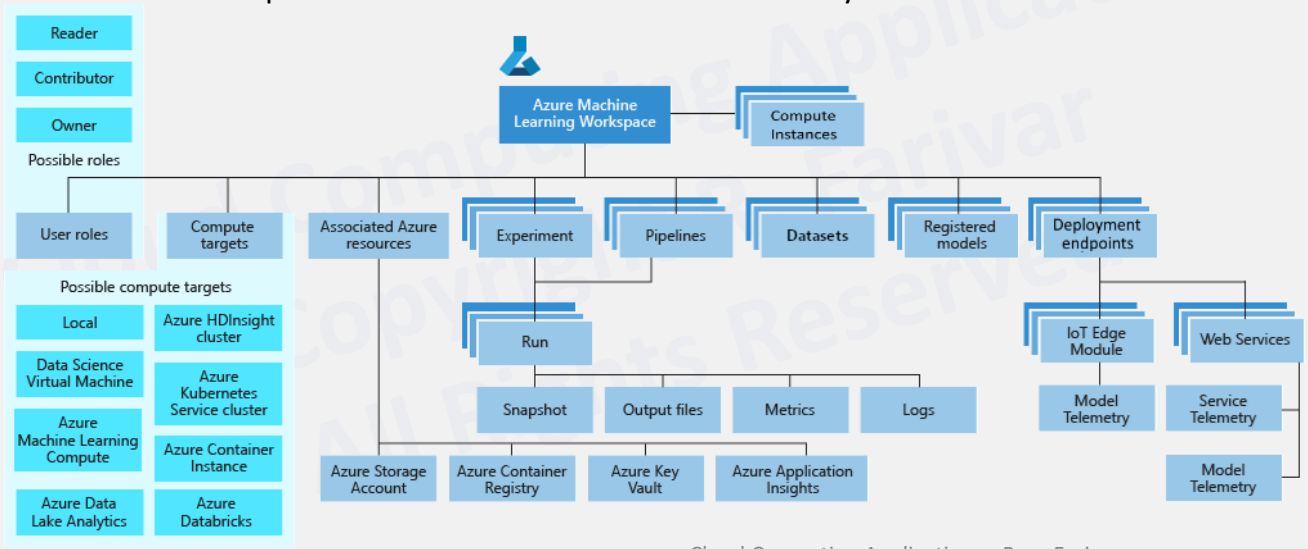
- AI Platform Notebooks
  - Managed notebooks
- AI Platform Training
  - Training with hyperparameter optimizations
- Continuous Evaluation
  - Model optimization
- AI Platform Predictions
  - Server model hosting deployment
- Kubeflow
  - Deployment of machine learning workflows on Kubernetes
- AutoML Tables



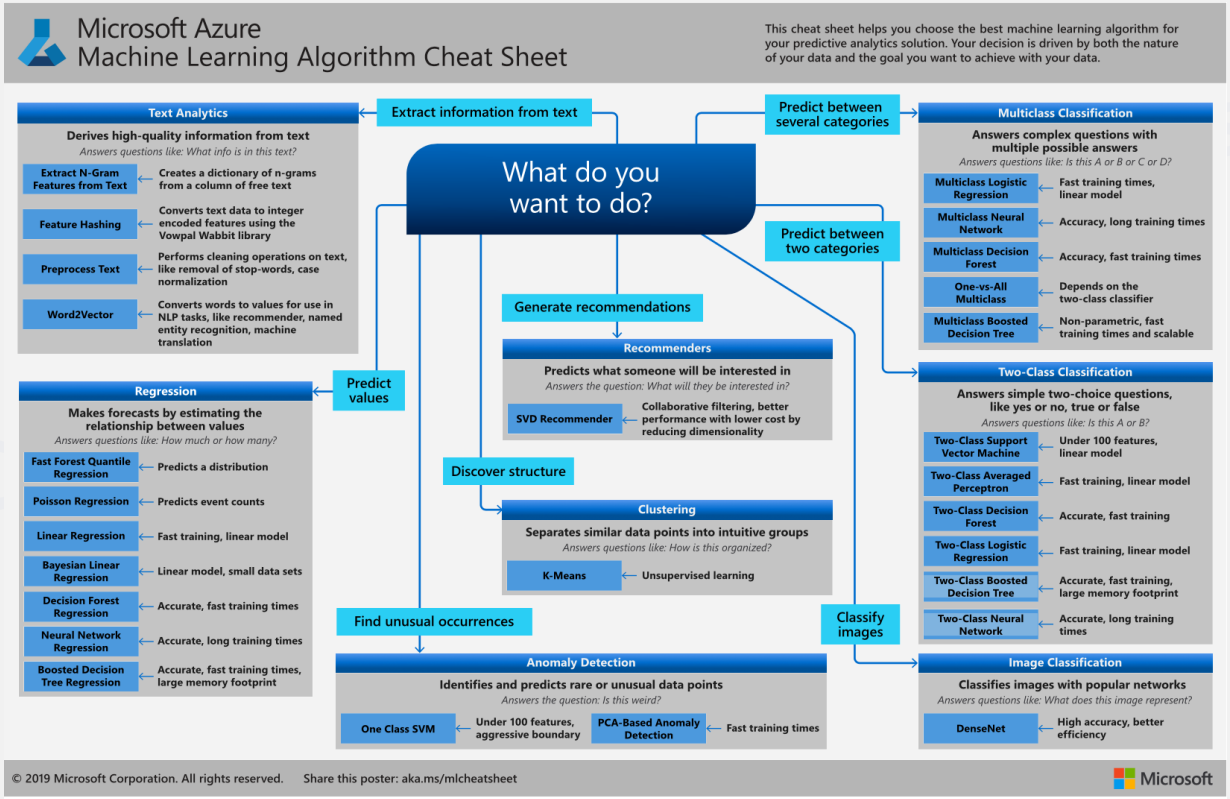
MS Azure Machine Learning

- Managed Platform
- Visual workflow design for no-code ML tasks: designer
- Managed Jupyter notebooks
  - The platform can launch the backend VM for you





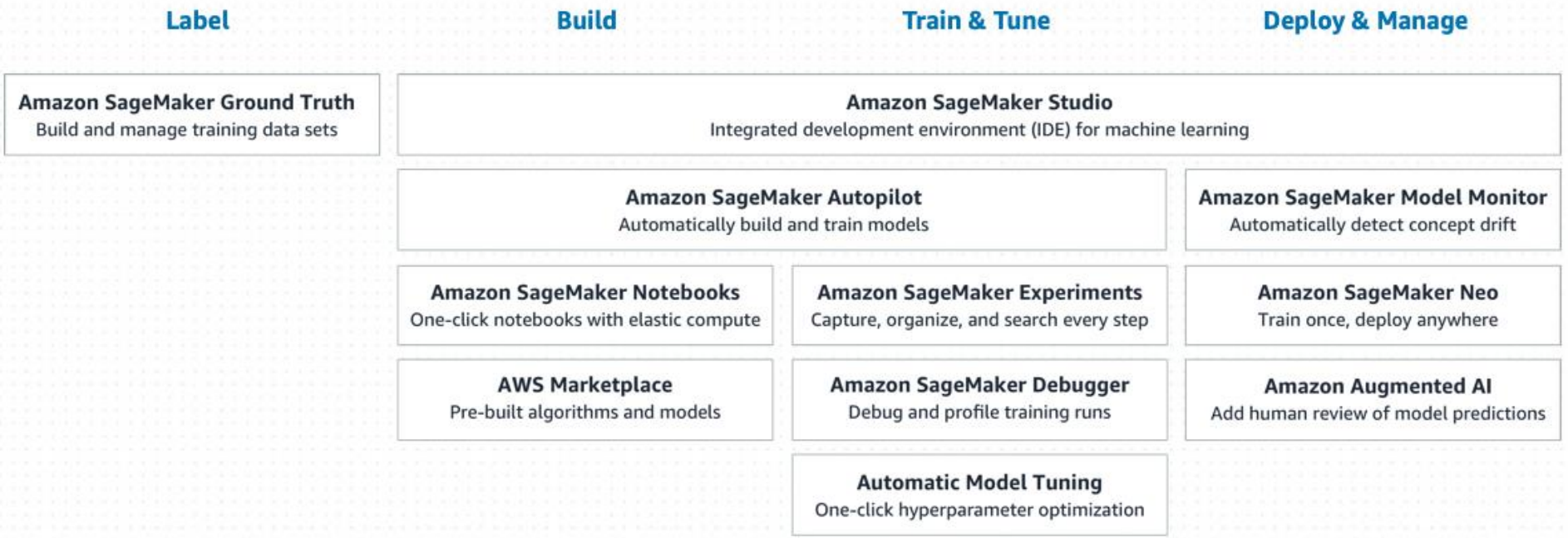
Azure Machine Learning Algorithm Cheat Sheet



Big Data Deployment on the Cloud

- Azure Databricks
  - Managed Spark Deployment
  - Spark MLlib
    - RDD based API
      - Older, will be deprecated
    - DataFrame based API
      - Also called Spark ML
- Azure HDInsight
  - Hadoop → Mahout
  - Spark
  - ML Services
    - Python and R-based analytics

AWS SageMaker



Cloud Machine Learning Artifacts Case Study

- Sagemaker training algorithms are packaged as Docker images
- Training
  - Any training algorithm can be utilizes as long as properly packaged
  - Sagemaker training job:
    - Launches a ML compute instance
    - Runs the train docker image
      - Creates the docker container in the ML compute instance
    - Injects the training data from an S3 location into the container
    - Uses the training code and training dataset to train the model
    - Saves the resulting model artifacts and other output in the output S3 bucket
- Model deployment
  - Creates the model resource
    - S3 path where the model artifacts are stored
    - Docker registry path for the image that contains the inference code
  - Creates an HTTPS endpoint
  - ML compute instances to deploy the model resource
- Model Usage
  - The client application sends requests to the Sagemaker HTTPS endpoint to obtain inferences from a deployed model