Homework H1.1

MOST POPULAR ML TECHNOLOGIES + PRODUCTS

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Content

- ✓ Quick Introduction of the 3 Technologies + Products
- ✓ IBM Watson ML
- ✓ Microsoft Azure ML Studio
- ✓ Google Cloud ML Plattform
- ✓ Learnings

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Machine Learning Technologies/ Products

IBM Watson ML – Sinan Yurttadur

Microsoft Azure ML Studio – Noah Bross

Google Cloud ML Plattform – Richard Mader

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This is IBM Watson ML

- Cloud service
- Run machine-learning models anywhere, across any cloud.
- Ist Open AI
- easy to use interface for build, manage, train and deploy models

https://www.ibm.com/cloud/machine-learning

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Deployment options

- Watson ML Cloud
  - deploy and run your model in the IBM Cloud
- Watson ML Server
  - deploy and run your model in any cloud

https://www.ibm.com/cloud/machine-learning

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Functions

- AutoAI
- One-Click deployment
- Model operations
- Intergrated UI end-to-end
- deploy any model at scale
- dynamic retraining

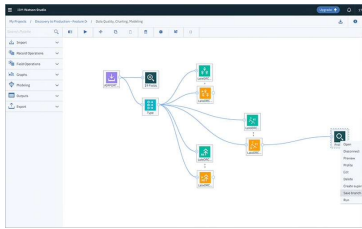https://www.ibm.com/cloud/machine-learning

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Product Image

https://www.ibm.com/cloud/machine-learning

Compare IBM ML

	Watson Machine Learning	Conventional ML tools
Hybrid multicloud deployment	☑	
Integrated with AutoAI	☑	
Prescriptive analytics solvers	☑	
Visual data science deployment	☑	☑
Access to data preparation	☑	☑
Advanced data refinery	☑	
Dynamic continuous learning	☑	
Neural network search	☑	
1-click open-source deployment	☑	
Automated AI lifecycle mgmt.	☑	
Monitoring and debiasing	☑	
Natural language integration	☑	
Visual recognition service	☑	

https://www.ibm.com/cloud/machine-learning

This is Azure Machine Learning Studio

- Cloud Service -> Machine Learning as a Service
- central tool for data scientists & developer
- interface for build, manage, train and deploy models

https://azure.microsoft.com/de-de/services/machine-learning/#faqs

Functions

- Automatic scaling of resources
- Connection to Microsoft ecosystem (PowerBI, database ...)
- Possibility to integrate open source RL algorithms & frameworks
- Beginners (drag and drop) and expert-friendly
- Automated MLAutomated creation of classification, regression and time series forecast
- Ability to understand how a model was created

https://azure.microsoft.com/de-de/services/machine-learning/#capabilities

Use Case

- computer vision
- forecasting
- text analysis
- hardware acceleration

Tooling & Language

- Visual Studio Code
- Visual Studio
- PyCharm
- Jupyter
- Python
- R

Frameworks

- MLflow
- Kubeflow
- ONNX
- PyTorch
- TensorFlow
- …

Interesting

The Studio supports around 100 methods that address *classification (binary+multiclass), anomaly detection, regression, recommendation,* and *text analysis.* It's worth mentioning that the platform has one *clustering* algorithm (K-means).

https://www.altexsoft.com/blog/datascience/comparing-machine-learning-as-a-service-amazon-microsoft-azure-google-cloud-ai-ibm-watson/

Pricing

https://azure.microsoft.com/de-de/services/machine-learning/#pricing

Bs-Serie

INSTANZ	VCPU(S)	RAM	PREIS FÜR LINUX-VM	MACHINE LEARNING DIENSTAUFPREIS	NUTZUNGSBASIERTE BEZAHLUNG GESAMTPREIS	RESERVIERUNG FÜR EIN JAHR (EINSPARUNGEN IN %) GESAMTPREIS	RESERVIERUNG FÜR DREI JAHRE (EINSPARUNGEN IN %) GESAMTPREIS
B2S	2	4 GiB	€0,036/Stunde	€0/Stunde	€0,036/Stunde	€0,021/Stunde (~42%)	€0,014/Stunde (~62%)
B2MS	2	8 GiB	€0,071/Stunde	€0/Stunde	€0,071/Stunde	€0,042/Stunde (~41%)	€0,027/Stunde (~62%)
B4MS	4	16 GiB	€0,140/Stunde	€0/Stunde	€0,140/Stunde	€0,083/Stunde (~41%)	€0,053/Stunde (~62%)
B8MS	8	32 GiB	€0,281/Stunde	€0/Stunde	€0,281/Stunde	€0,165/Stunde (~42%)	€0,106/Stunde (~62%)
B12MS	12	48 GiB	€0,421/Stunde	€0/Stunde	€0,421/Stunde	€0,247/Stunde	€0,159/Stunde

Example 1

Scandinavian Airlines

Mit Azure Machine Learning kann SAS Betrug mit einer Genauigkeit identifizieren, die nicht mit manuellen Methoden möglich war. Beim rückwirkenden Registrieren eines Flugs für EuroBonus-Meilen (eine gängige Betrugsquelle) sagt das neue System Betrugsversuche mit einer Genauigkeit von 99 % voraus.

https://azure.microsoft.com/de-de/services/machine-learning/#customer

Example 2

"With MLOps capabilities in Azure Machine Learning, we've improved bus departure predictions by 74 percent, and riders spend 50 percent less time waiting."

Sze-Wan Ng: Director of Analytics & Development, Translink

https://azure.microsoft.com/de-de/services/machine-learning/#customer

Popularity

Interest over time

● Amazon Machine Learning   ● Azure Machine Learning

Durchschnitt   06.10.2019   17.05.2020

https://stackshare.io/stackups/amazon-machine-learning-vs-azure-machine-learning

This is Google Cloud AI-Platform

- Infrastructure for Machine-Learning
- Tools & accompanying services

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Training service

- Train on Google's hardware
- Own or integrated algorithms
- Store training data in Google Cloud

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Forecast service

- Host models in the cloud
- Own models can also be operated

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Pipelines

Automation of ML tasks
- ✓ Prepare data
- ✓ Train
- ✓ Evaluate
- ✓ Deployment

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Notebooks

- Jupyterlab in the Google Cloud
- Suitable hardware can be selected

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Data Labeling Service

- Labeling of records as a service
- Pictures, videos & text

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Use Case

- Cloud console
- "Gcloud" CLI
- Rest API

Direct Compare of the Technologies

Download compare.pdf for more informations

https://drive.google.com/file/d/1u4S4xrq9WkFHbKhNaqTX-M6hW0BmWqOc/view?usp=sharing