

ECII/ECSI 3206:
Artificial Intelligence [and expert systems]
Topic 10:A.I programming languages[Python]

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Machine learning Environments

- **1. Google Colaboratory**

- It's a cloud service that can be easily accessed to develop products and projects, provided by Google. It supports free GPUs and is based on the *Jupyter* Notebooks setting. It provides a forum for everyone to build machine learning and deep learning applications using widely used libraries like *PyTorch*, *TensorFlow*, and *Keras*. It offers a way for your system not to take out the full workload of your ML activities. It's one of the most successful platforms of its kind.
- **RAM** – 12 GB to 26.75 GB
- **Disk Space** – 25 GB
- **CPU Cores** – 2
- **Languages Supported** – Python

- **2. IBM Watson**

- IBM launched the Watson Data Platform and Data Science Experience (DSX) to support open-source solutions. Eventually, it launched the multi-cloud freedom of choice platform for data science work. This was achieved with the help of containerization of the stack by *Kubernetes*. As a consequence, it can be distributed in *Docker* or *CloudFoundry* containers wherever the data is stored.
- **RAM** – 16 GB
- **Disk Space** – 90 GB
- **CPU Cores** – 4
- **Languages Supported** – Apache Spark, Python, R, Scala

- **3. Kaggle Kernel**

- It's an excellent platform for deep learning and machine learning applications in the cloud. Kaggle and Colab have a variety of similarities, both being Google products. It supports the *Jupyter* Notebooks in the browser. Many of the *Jupyter* Notebook keyboard shortcuts are almost the same as Kaggle. Kaggle has a large collection of datasets and has a broad community devoted to promoting, learning, and validating data science skills. The use of GPU and TPU has some usage restrictions in the Kaggle kernel.
- **RAM** – 25 GB
- **Disk Space** – 155 GB
- **CPU Cores** – 1
- **Languages Supported** – Python, R

- **4. Coclac**

- It is a virtual online workspace for computing, research, collaboration, and writing documents. This includes working with the full range of scientific languages, provides author text functionality in *LaTeX*, *R/knitr* or Markdown, a web-based *Linux* console, *time travel* feature, and networking resources such as chat rooms, course management, and more. However, most of its features come under a paid plan.
- **RAM** – 16 GB
- **Disk Space** – 20 GB
- **CPU Cores** – 3
- **Languages Supported** – Julia, Octave, Python, SageMath, R Statistics, etc.

- **5. Microsoft Azure**

- Microsoft's Azure notebooks are somewhat similar in functionality to Colab but it wins in terms of speed and is much better than Colab in this respect. Azure Notebooks is a series of linked notebooks called Libraries. These libraries are smaller than 100 megabytes in size of each data file. Azure Notebooks are more suited for basic applications. Azure provides only 12 months of free service.
- **RAM** – Variable
- **Disk Space** – Variable
- **CPU Cores** – Variable
- **Languages Supported** – Python, R, F#

Machine learning libraries

TensorFlow is an end-to-end open source platform for machine learning. It has a comprehensive, flexible ecosystem of tools, libraries and community resources that lets researchers push the state-of-the-art in ML and developers easily build and deploy ML powered applications.

TensorFlow was developed by the Google Brain team for internal Google use. It was released under the Apache License 2.0 in 2015

TensorFlow provides stable Python (for version 3.7 across all platforms)

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- It allows us to Build and train ML models easily using intuitive high-level APIs like Keras with eager execution, which makes for immediate model iteration and easy debugging.
 - Applications:
 - Neural networks[beginner]
 - Recommender systems[intermediate]
 - Generative adversarial networks[advanced]

Useful Links on Python A.I. practice

- **A Comprehensive Guide To Artificial Intelligence With Python**
 - Link: [<https://www.edureka.co/blog/artificial-intelligence-with-python/>]
- **Using Tensorflow with Python Pycharm IDE**
 - Link: [<https://www.techwithtim.net/tutorials/machine-learning-python/introduction/>]
- **IBM Watson Machine Learning using the MNIST database**
 - Link: [<https://dataplatform.cloud.ibm.com/docs/content/wsj/analyze-data/ml-mnist-tutorials.html>]

NB: Click on the above links for a comprehensive hands-on guide