Walchand College of Engineering, Sangli

Data Mining ISE 2

Exclusive Python frameworks for AI & ML application

- Presented by
  Saurabh Nagre
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- Under guidance of Dr. B. F. Momin

Agenda

- Introduction
- Use of Frameworks
- List of AI-ML Frameworks
- How to Use?
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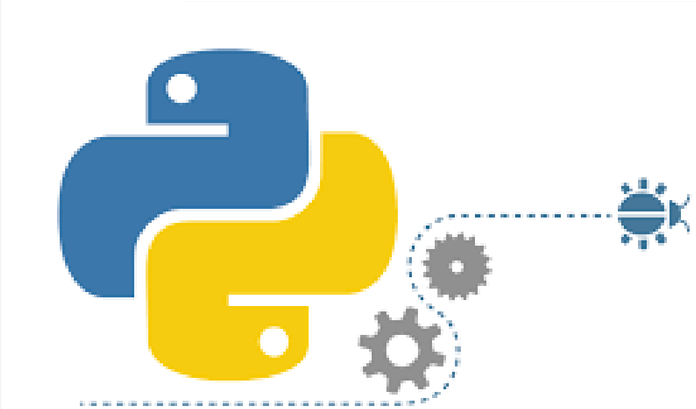
Introduction to the AI-ML frameworks

- In the 1950s, a young mathematician Alan Turing explored the possibility of the existence of artificial intelligence mathematically.
- The framework serves as a foundation, so you're not starting entirely from scratch.
- In AI ML, we need to build algorithmic models, these frameworks help us to work on boilerplate code.
- We can build classification, regression, clustering, and speech recognition models using these frameworks.



Use of Framework

- More secure code
- Simpler testing and debugging
- Avoiding duplicate code
- Clean and easily adaptable code
- Able to focus on writing code specific to the project
- Can be extended

Let's look at some of python AI-ML Frameworks

Tensorflow

- TensorFlow is Google’s brainchild for machine learning and high-performance numerical computation.
- TensorFlow is an open-source AI framework to perform complex numerical computations in large volumes using data-flow graphs.
- It has built-in modules for visualization, inspection, and model serialization.
- It is useful for natural language processing, deep neural networks, image and speech recognition, and other functions for Deep Learning.

PyTorch

- PyTorch is a Facebook developed framework to speed up python app development for machine learning
- It has a C++ frontend along with the Python interface.
- Design computational graphs and change them on the fly instead of using pre-defined ones.
- Implement network architectures like Recurrent Neural Networks (RNN), Convolutional neural networks (CNN), Long Short-Term Memory (LSTM), etc.
- PyTorch remains the underlying platform powering Facebook’s over 4000 AI workloads

Spark ML

- It supports a large number of ML algorithms, ML workflows, and other utilities.
- It is one of the top Machine Learning frameworks and libraries that eliminate the complexities in preparing and processing large amounts of data.
- Implement algorithms like classification, regression, decision trees, random forests, alternating least squares (ALS)
- Frequent itemsets, association rules, and sequential pattern mining
- Tools for constructing, evaluating, and tuning ML Pipelines

How to use these frameworks in python?

- Install using a package manager like pip or anaconda, ex. pip install tensorFlow
- import the library using the import module ex. import TensorFlow as tf
- Now, using various built-in pre-processing, model building algorithms

ex. model = tf.keras.models.Sequential([
tf.keras.layers.Flatten(input_shape=(28, 28)),
tf.keras.layers.Dense(128, activation='relu'),
tf.keras.layers.Dropout(0.2),
tf.keras.layers.Dense(10, activation='softmax')
])

References

- https://www.tensorflow.org/overview
- https://pytorch.org/
- https://spark.apache.org/docs/latest/ml-guide.html
- https://towardsdatascience.com/top-8-ai-and-machine-learning-frameworks-for-beginners-4e3996fc27f
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