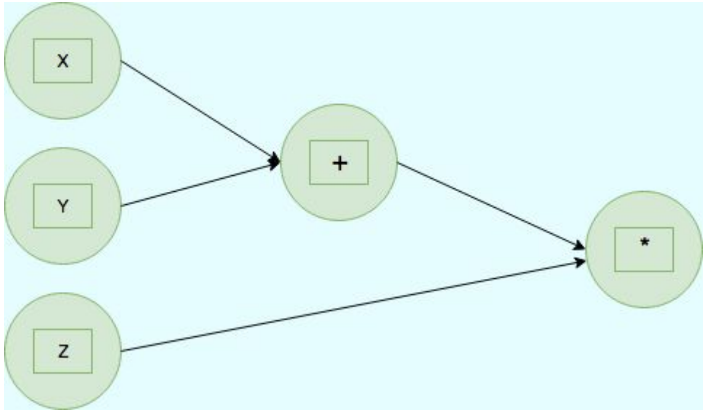
Deep Learning frameworks

TensorFlow Keras PyTorch

TensorFlow

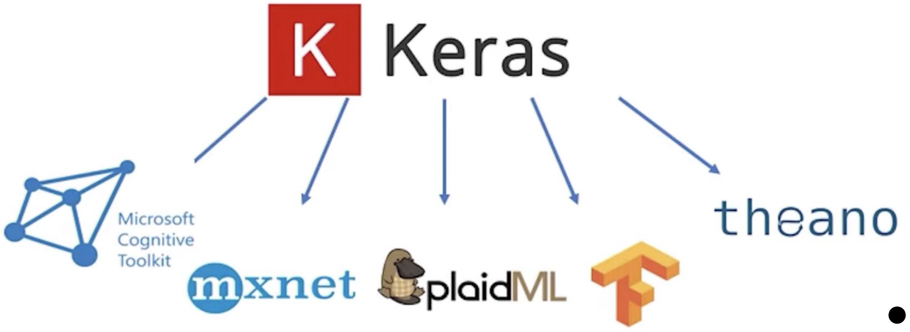
- Low level-software library created by Google to implement ML models and to solve complex numerical problems.



- It performs calculations by converting every element into graphical form. The variables of the graph are called **Tensors** and the mathematical operations are called **operators.**

Tensors are IMMUTABLE.

Keras

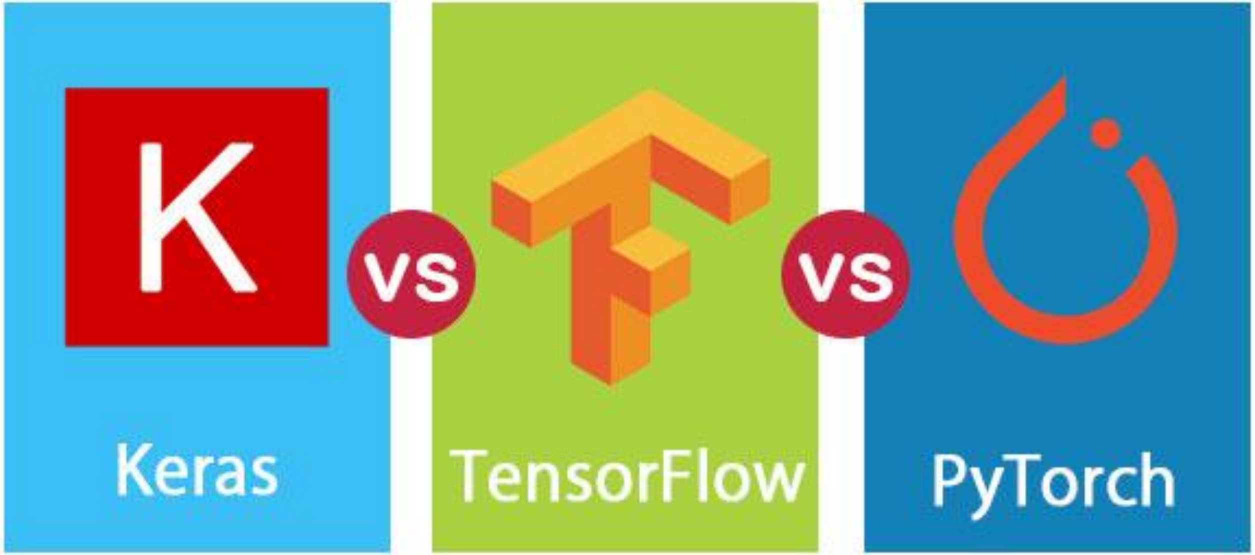


- A high-level deep learning API written in Python for easy implementation and computation of neural networks.

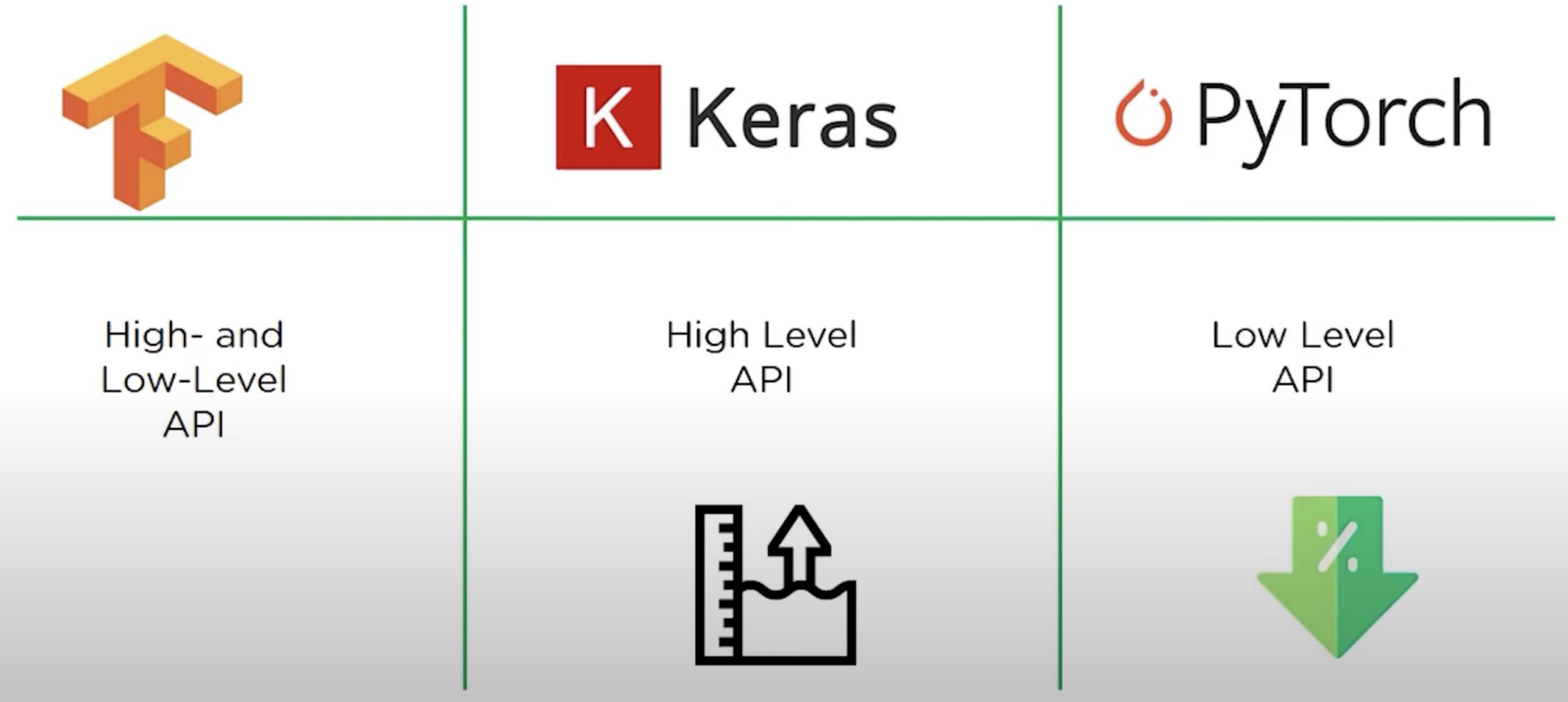
- It also integrates with various backend engines to help with fast computation while miniating ease of implementation.

PyTorch

- A low-level API developed by Facebook AI for Natural Language Processing and Computer Vision tasks.
- Think of a more powerful version of NumPy.
- Emphasizes flexibility and allows Deep Learning models to be expressed in basic Python.

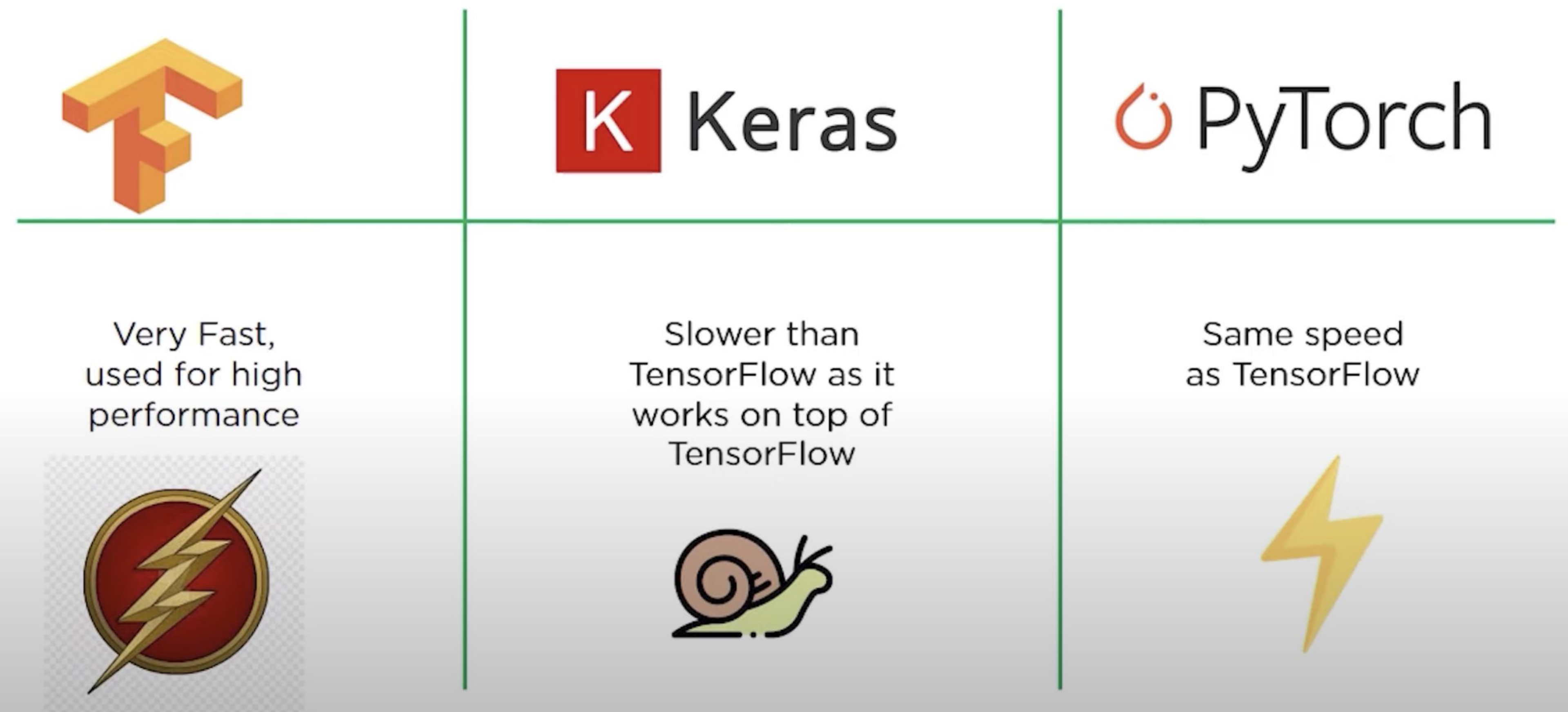

Keras
vs
TensorFlow
vs
PyTorch

1. Level of API



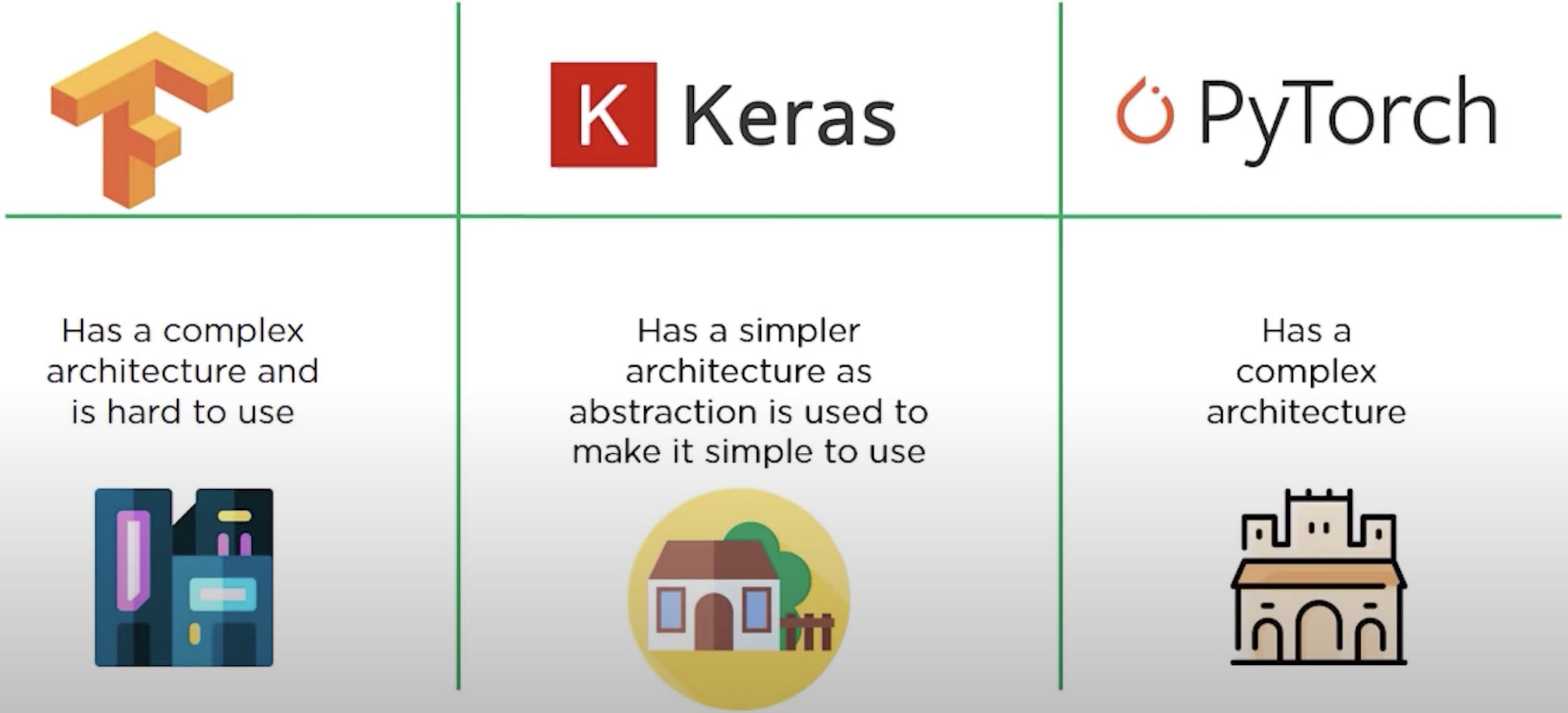
	Keras	PyTorch
High- and Low-Level API	High Level API	Low Level API

2. Speed



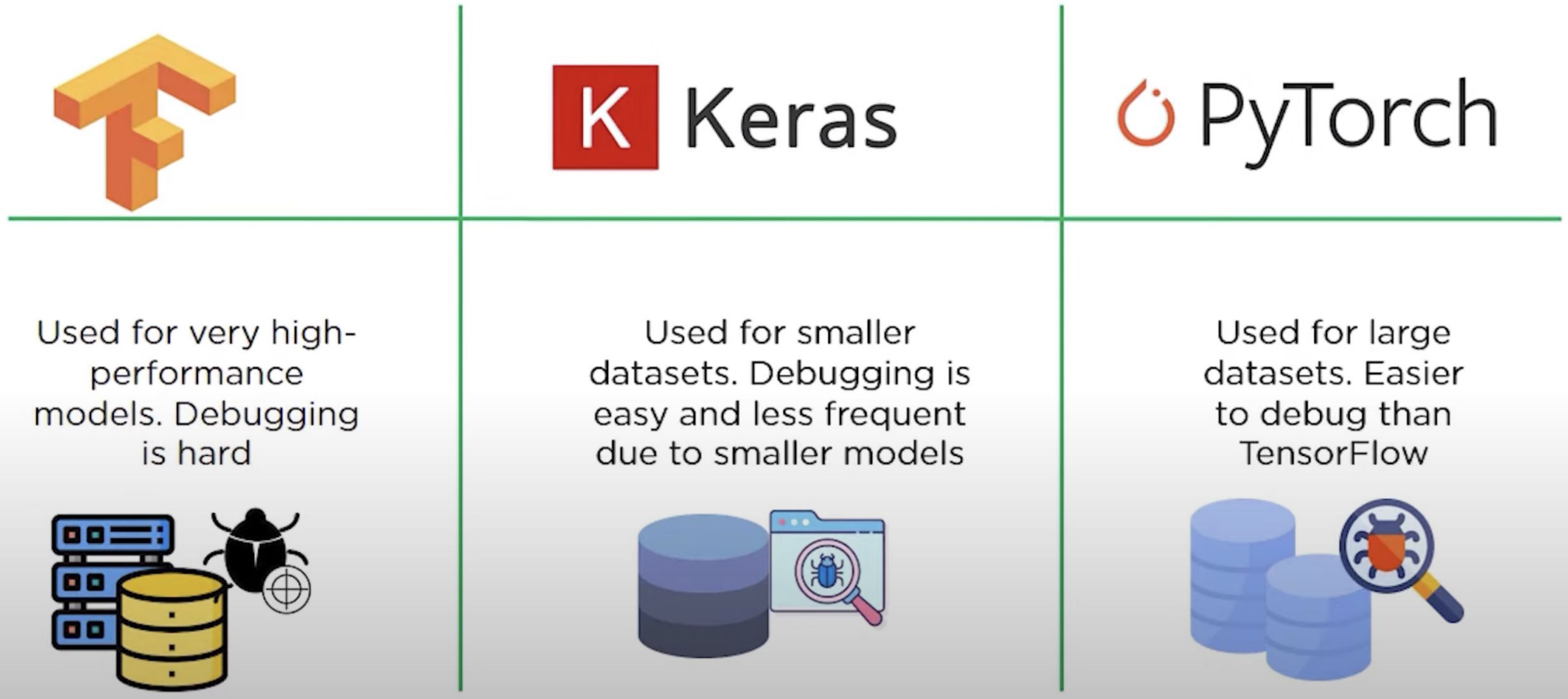
	Keras	PyTorch
Very Fast, used for high performance	Slower than TensorFlow as it works on top of TensorFlow	Same speed as TensorFlow

3. Architecture



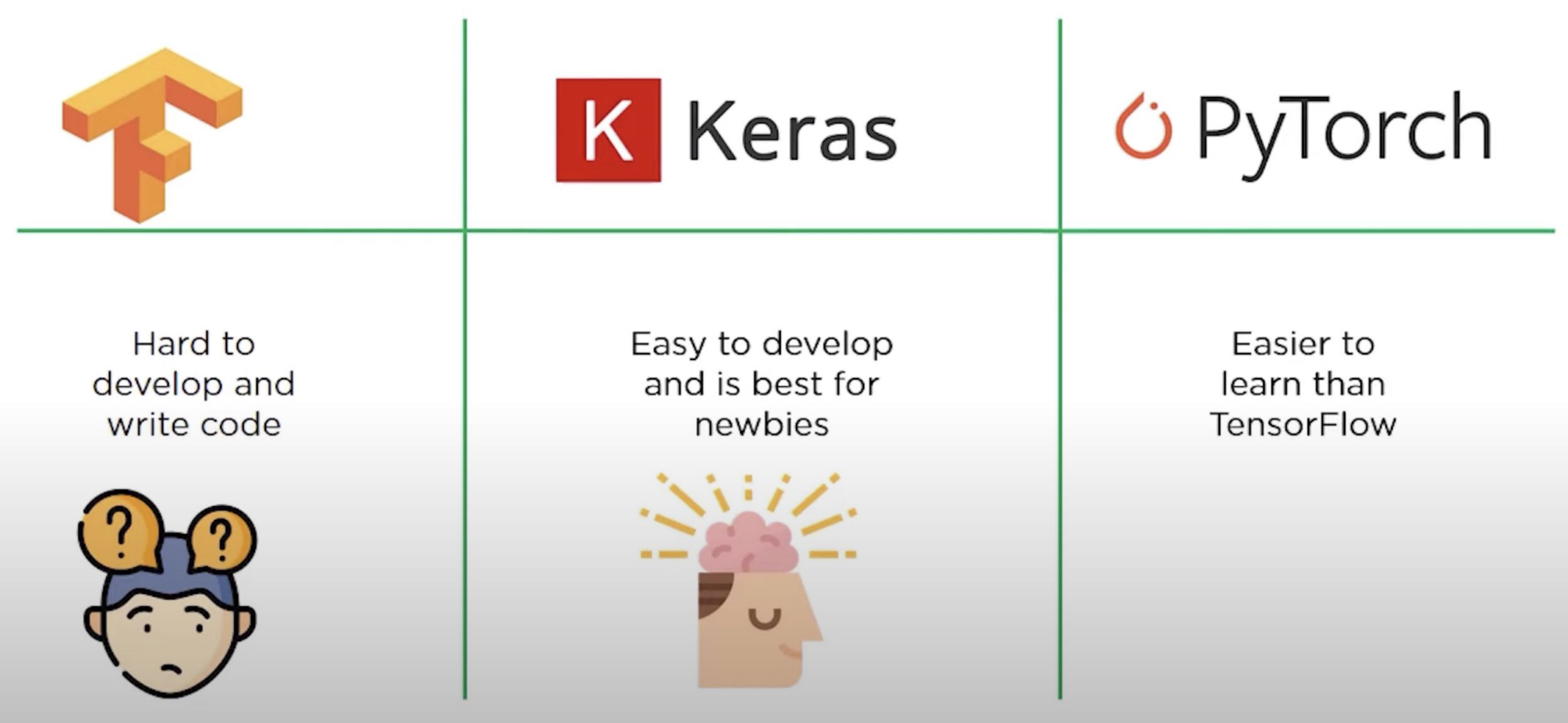
	Keras	PyTorch
Has a complex architecture and is hard to use	Has a simpler architecture as abstraction is used to make it simple to use	Has a complex architecture

4. Datasets and Debugging



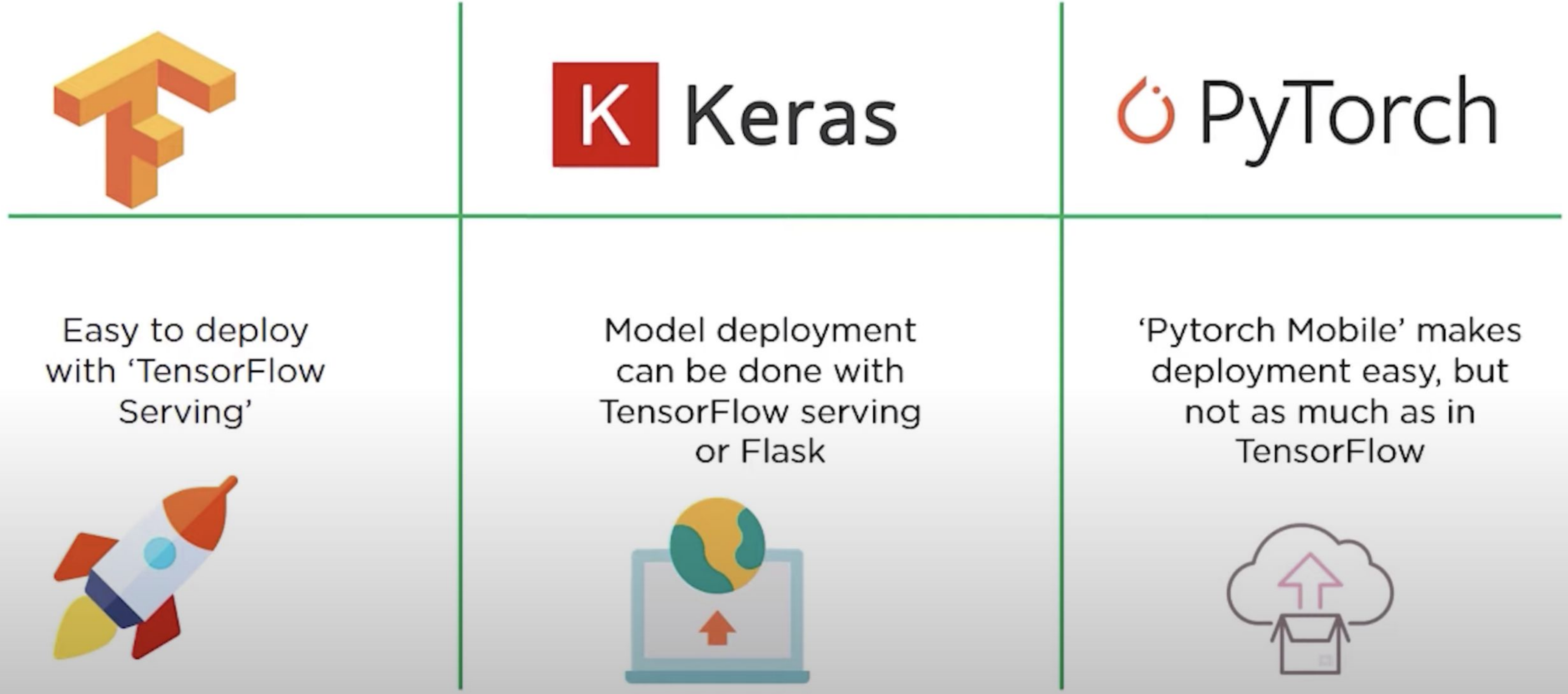
	Keras	PyTorch
Used for very high-performance models. Debugging is hard	Used for smaller datasets. Debugging is easy and less frequent due to smaller models	Used for large datasets. Easier to debug than TensorFlow

5. Ease of Development

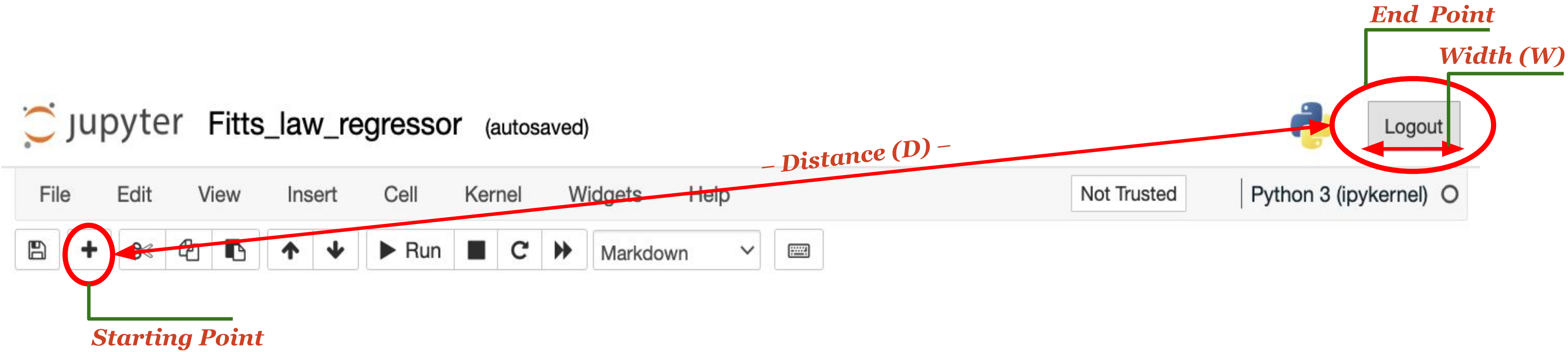


	Keras	PyTorch
Hard to develop and write code	Easy to develop and is best for newbies	Easier to learn than TensorFlow

6. Ease of Deployment



	Keras	PyTorch
Easy to deploy with 'TensorFlow Serving'	Model deployment can be done with TensorFlow serving or Flask	'Pytorch Mobile' makes deployment easy, but not as much as in TensorFlow



End Point

Width (W)

– Distance (D) –

Starting Point