What’s Coming Next

Course Sequence

Course 1

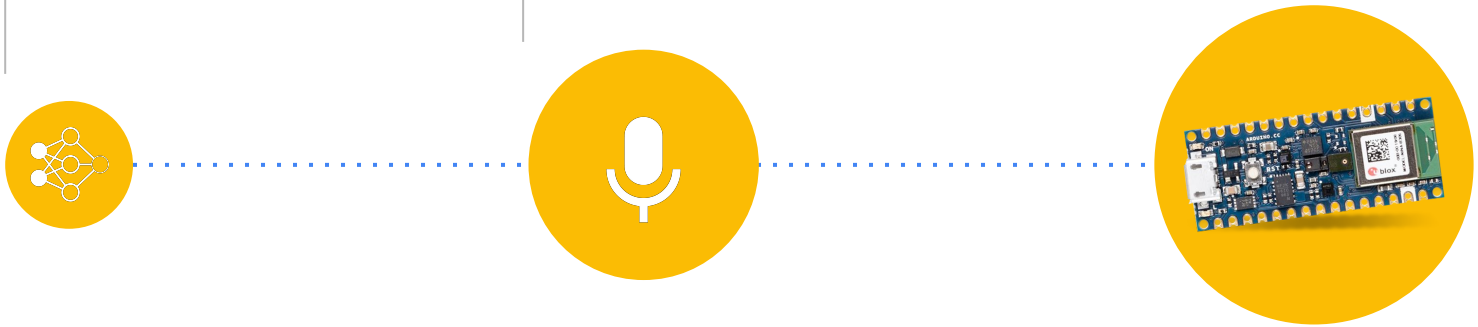
Fundamentals of TinyML

Course 2

Applications of TinyML

Course 3

Deploying TinyML



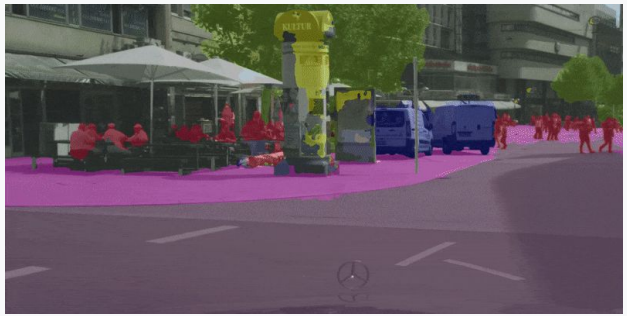
Learning

An introduction to a variety of TinyML applications and sensor types, along with a deep dive into how to build some of them (e.g., speech commands). You will learn the importance of dataset engineering and responsible AI methods.

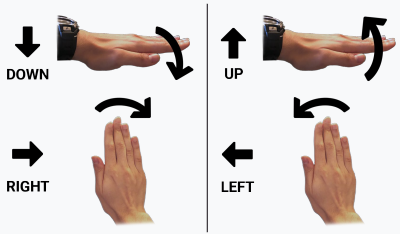
Real world TinyML Applications using Colab

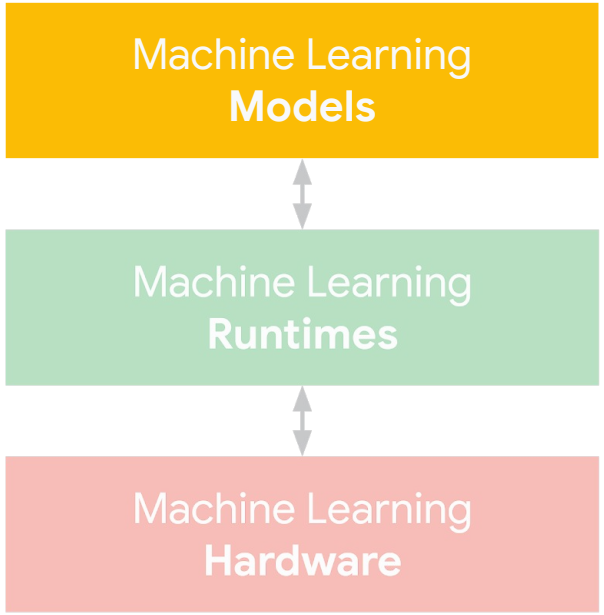
Speech

Vision



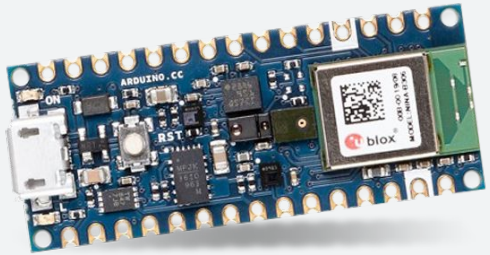
IMU



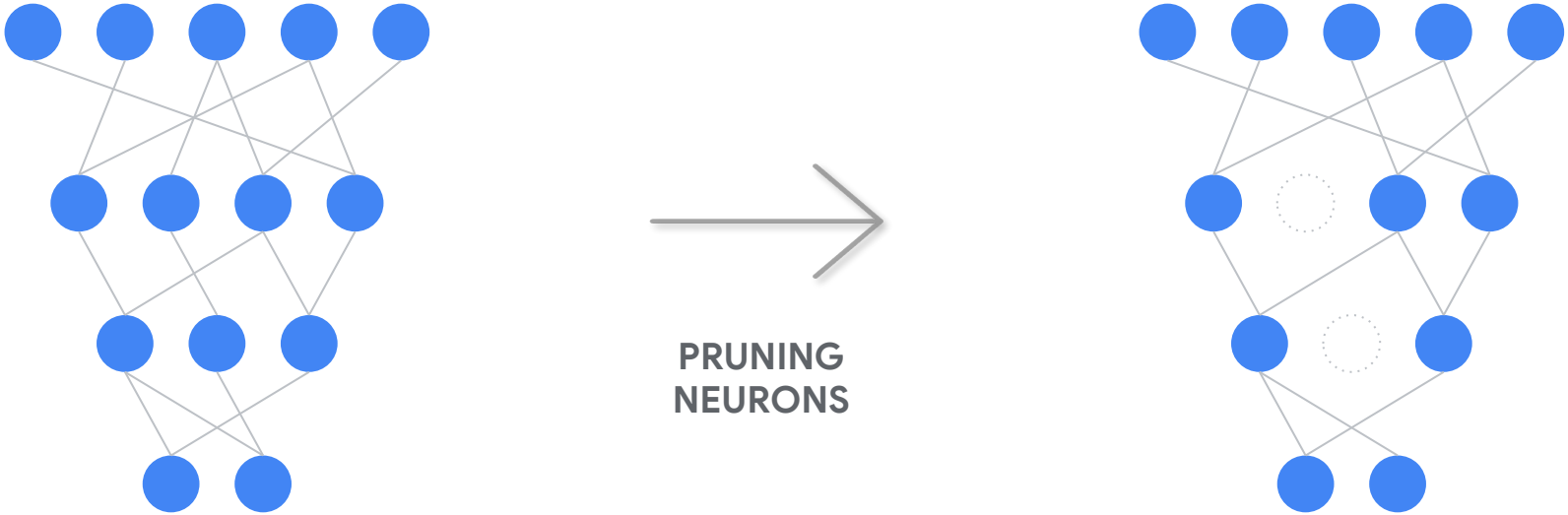


Problem:

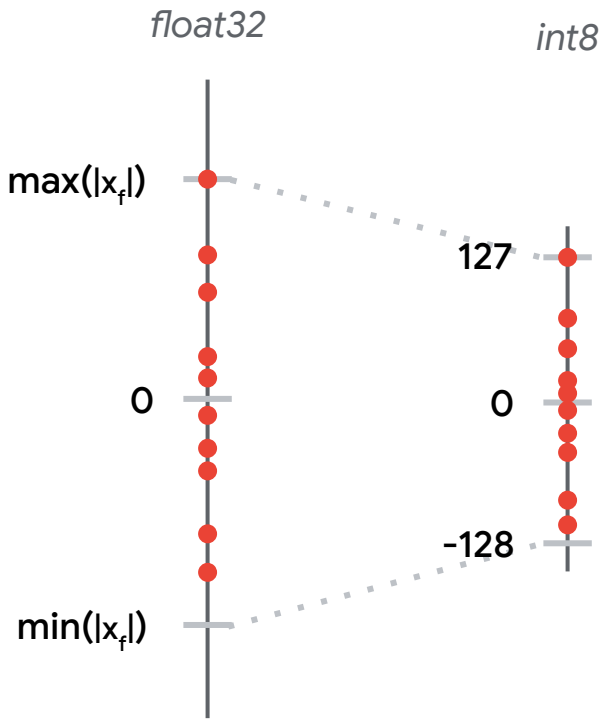
Our board (in your kit for Course 3) only has **256KB** of RAM (memory) yet ***MobileNetv1*** needs **16.9MB**!



Pruning

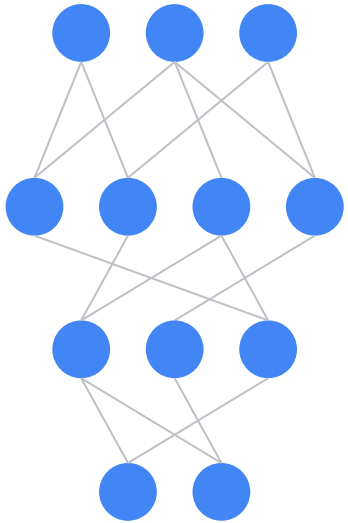


Quantization

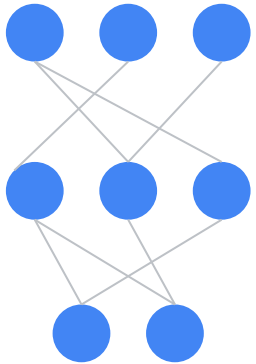


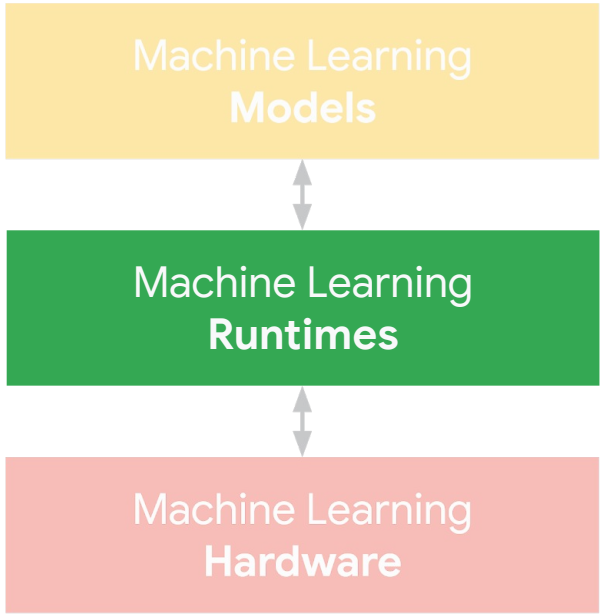
Knowledge Distillation

TEACHER



STUDENT

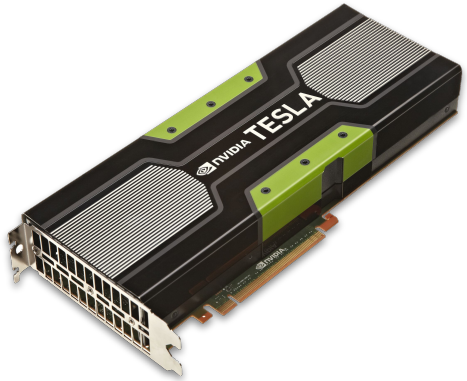



Machine Learning
Models
Machine Learning
Runtimes
Machine Learning
Hardware

TensorFlow

TensorFlow Lite

Train a model → Convert model → Optimize model → Deploy model at Edge → Make inferences at Edge



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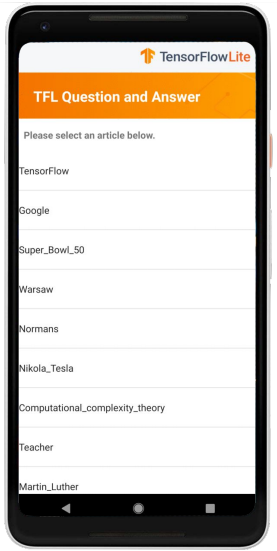

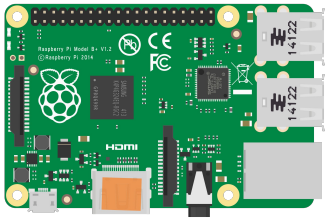

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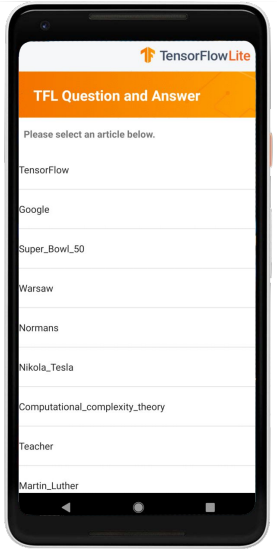

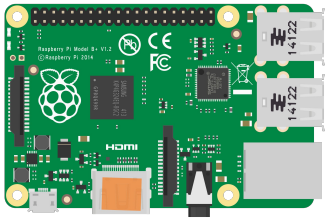

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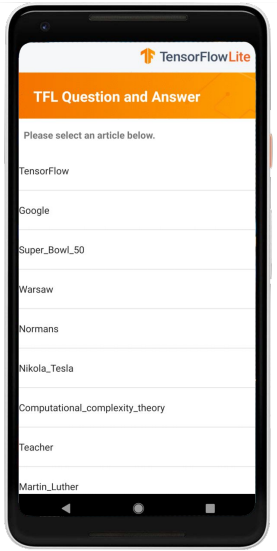

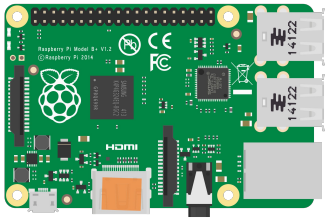

Key Differences

	TensorFlow	TensorFlow Lite
Topology	Variable	Fixed
Weights	Variable	Fixed
Binary Size	Unimportant	High Priority
Distributed Compute	Needed	Not Needed
Developer Background	**ML Researcher**	**Application Developer**

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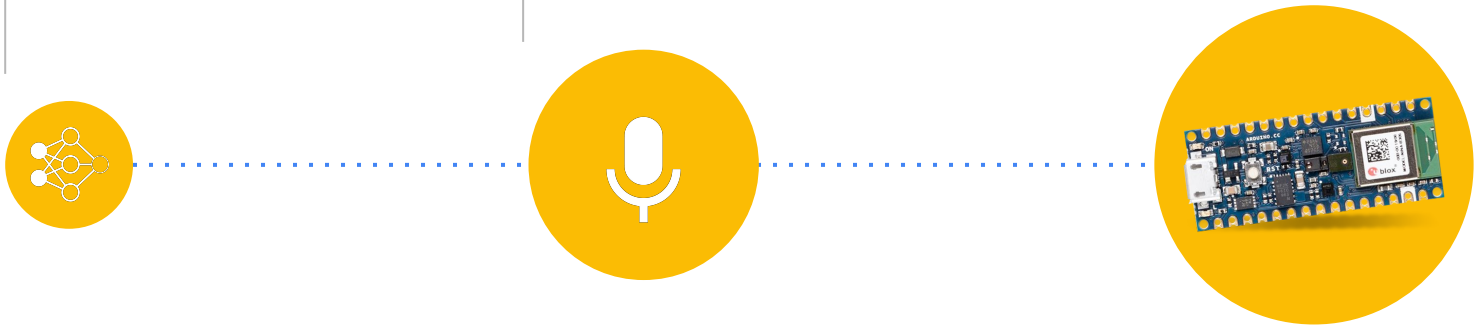


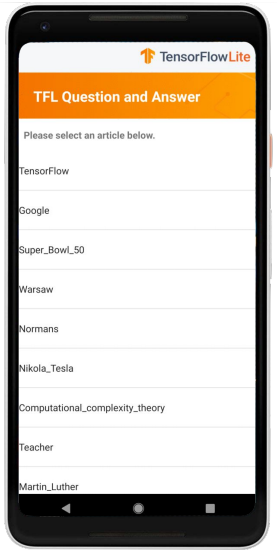
Learning

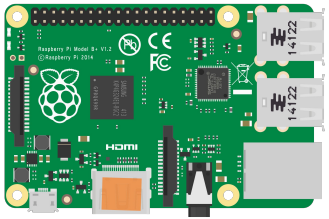
You will learn how to deploy models on a real microcontroller. Along the way you will explore the challenges unique to and amplified by TinyML (e.g., preprocessing, post-processing, dealing with resource constraints).

TensorFlow

TensorFlow Lite

Train a model → Convert model → Optimize model → **Deploy model at Edge** → **Make inferences at Edge**





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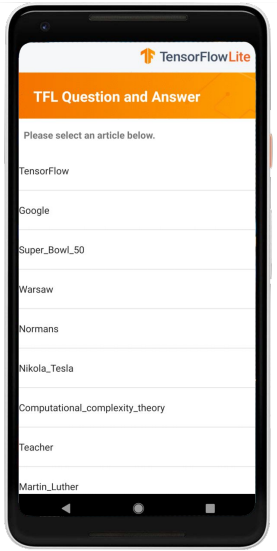

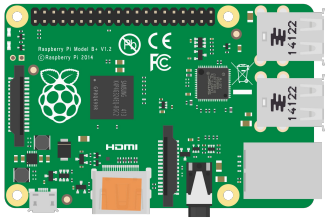

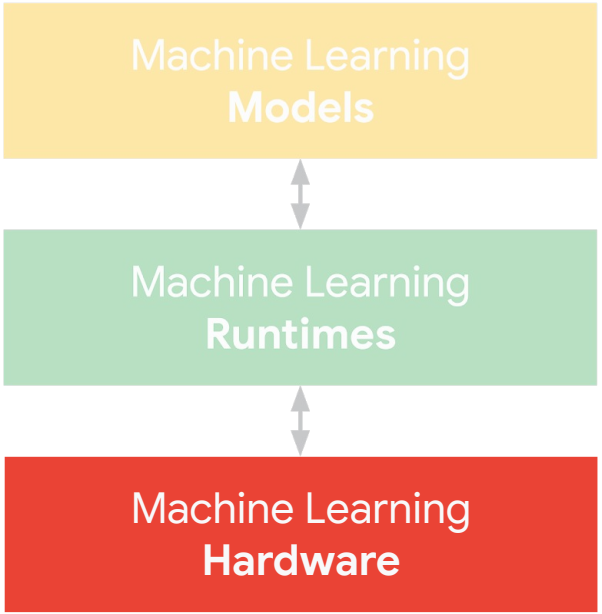
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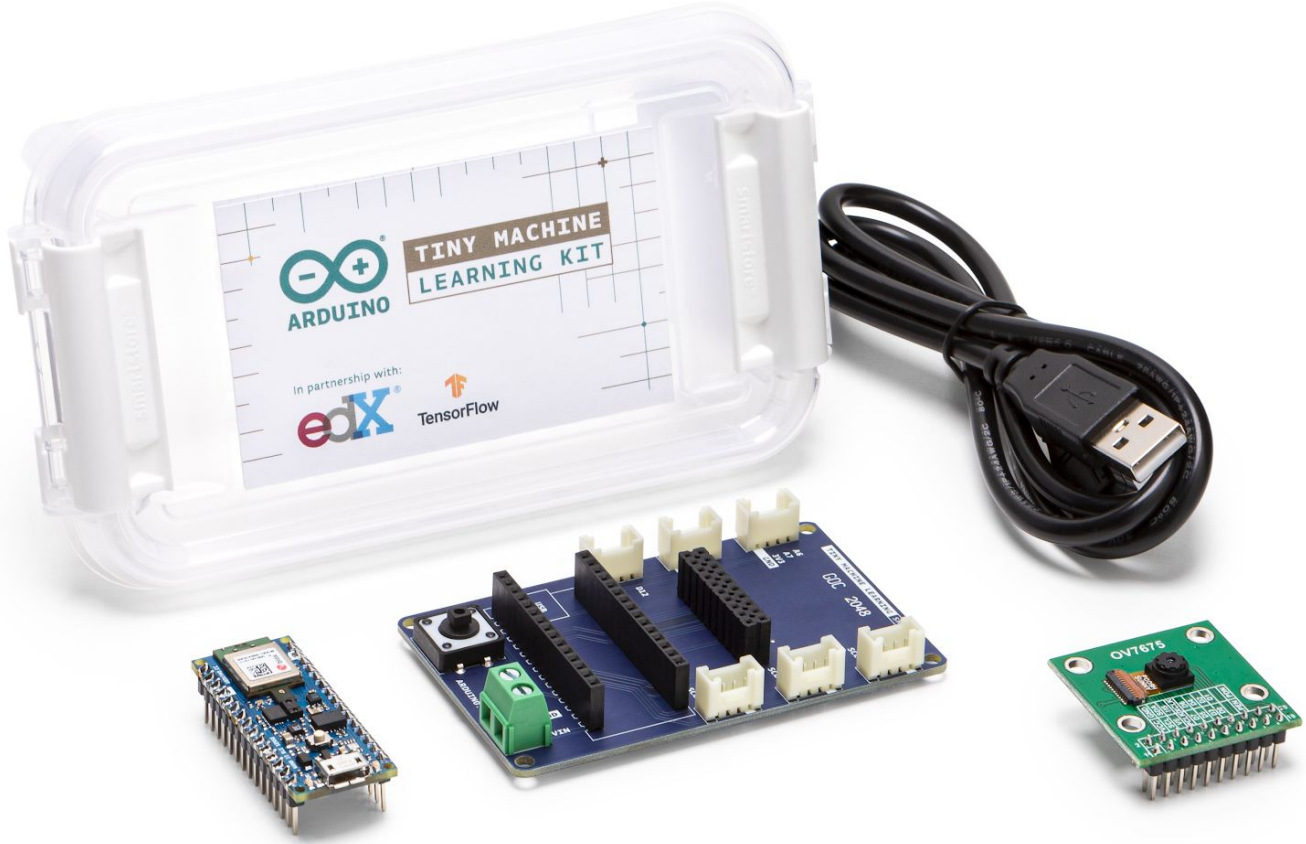
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TINY MACHINE
LEARNING KIT
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TensorFlow
OV7675