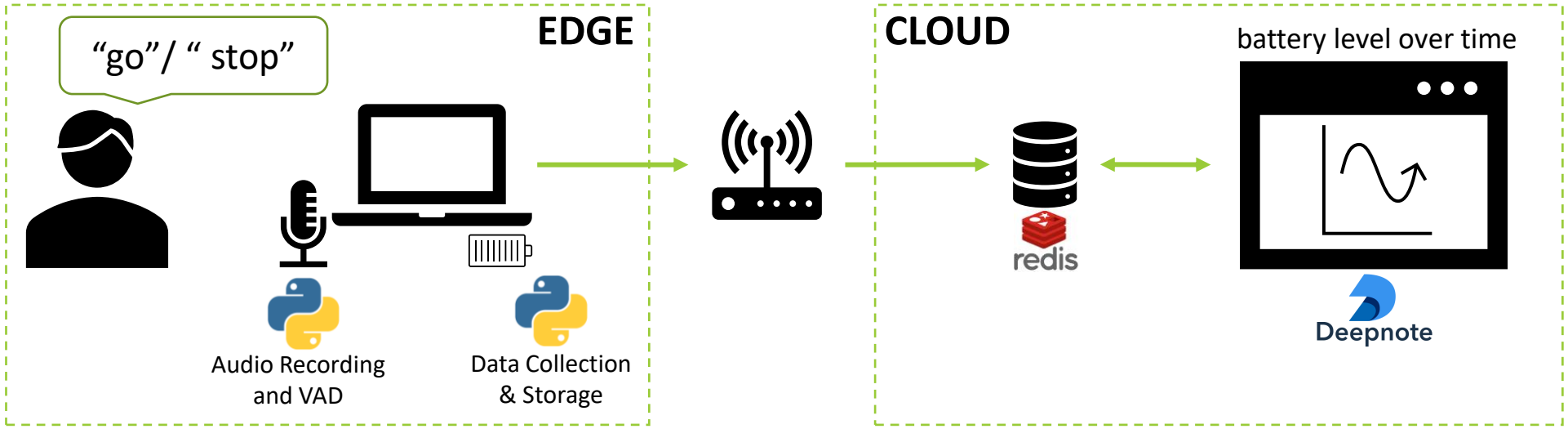
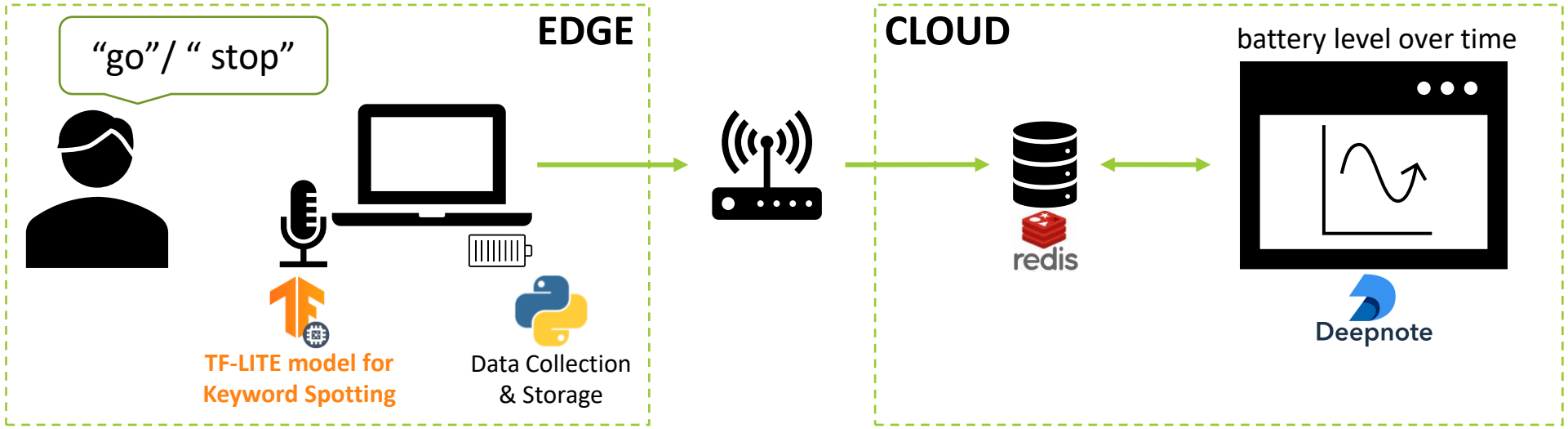
Machine Learning for IoT

LAB3: Training & Deployment

LAB1-2: Smart Battery Monitoring (Simplified)



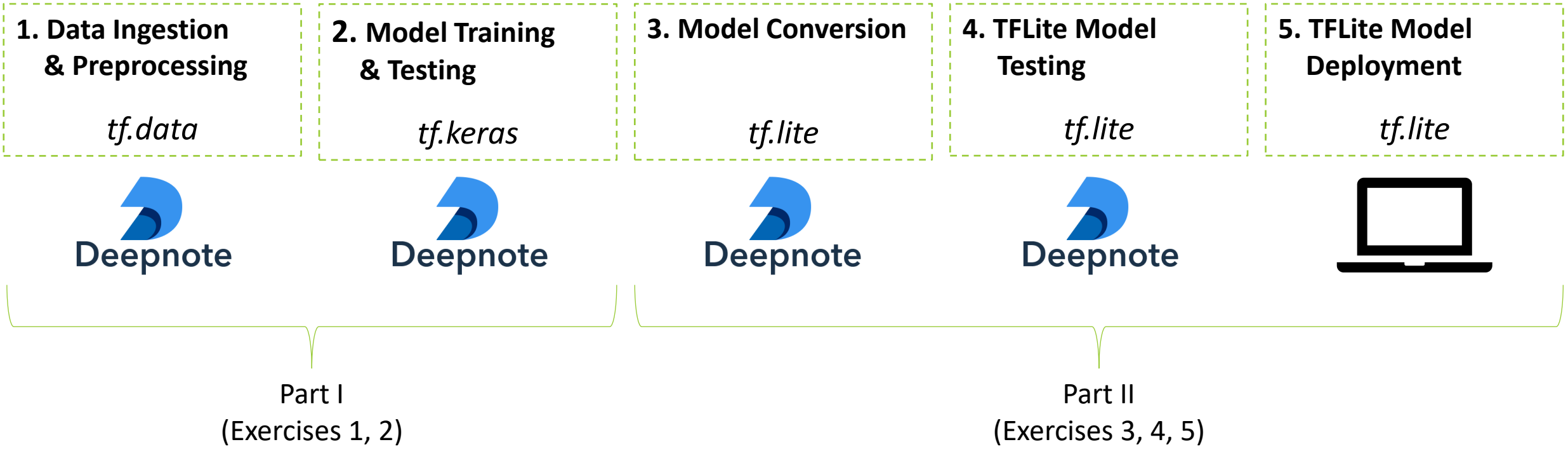
LAB3-4: Smart Battery Monitoring w/ KWS



Training & Deployment Flow

1. Data Ingestion & Preprocessing	2. Model Training & Testing	3. Model Conversion	4. TFLite Model Testing	5. TFLite Model Deployment
tf.data	*tf.keras*	*tf.lite*	*tf.lite*	*tf.lite*
Deepnote	Deepnote	Deepnote	Deepnote	

Training & Deployment Flow



Model Metrics

- Functional Metrics
  - E.g., Classification:
    - **Top-1 Categorical Accuracy**
    - Precision
    - Recall
    - F-Score
    - Confusion Matrix
    - …
- Extra-functional Metrics
  - Memory
    - the size of the TFLITE model
  - Latency
    - Preprocessing + Model Prediction execution time

Use case: KWS on Mini Speech Commands

- The *Mini Speech Commands* (MSC) dataset is a subset of the *Speech Commands* dataset (Warden, 2018)
- The MSC dataset collects 8000 samples of eight keywords ('down', 'no', 'go', 'yes', 'stop', 'up', 'right', 'left'), 1000 samples per label. Each sample is recorded at 16kHz with an int16 resolution and has a variable duration (1s the longest).