MACSE604 –Edge Intelligence

Week 5

Edge Impulse

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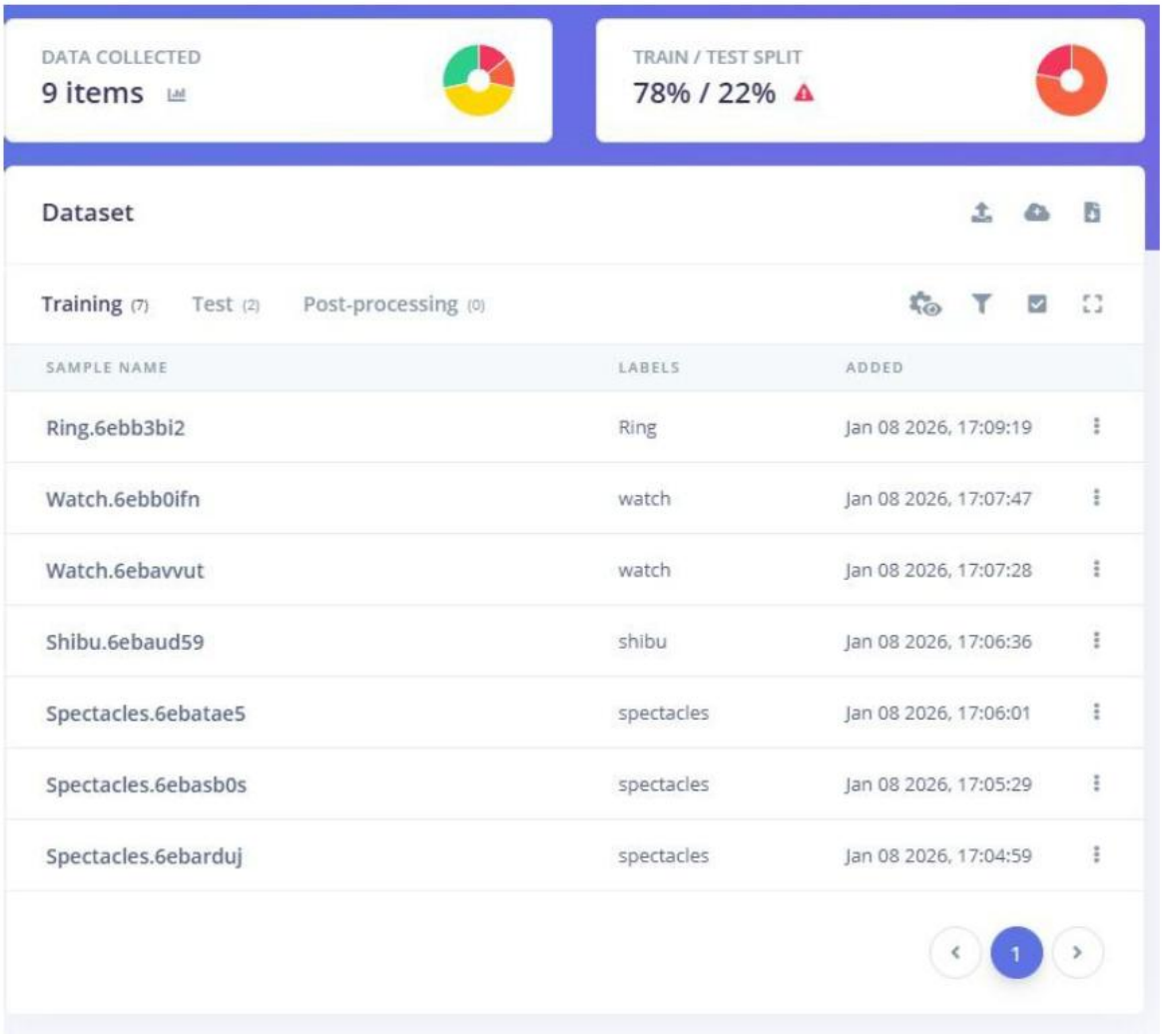
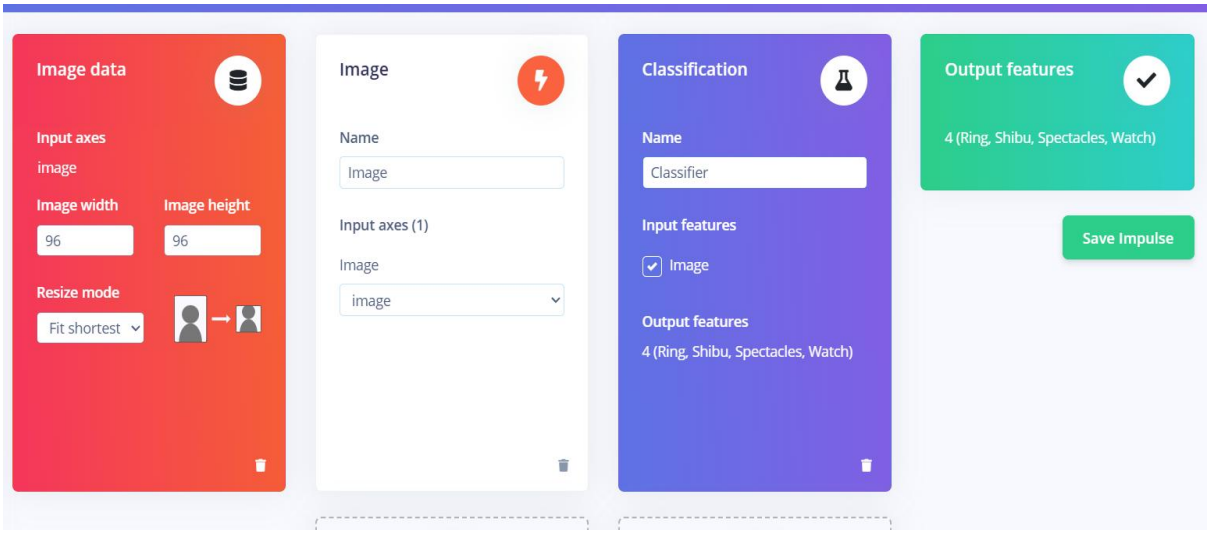
First Try (Failed)

- In my first attempt I have collected a total of 9 images across 4 classes
- I failed to account for the number of data required for the model to train properly



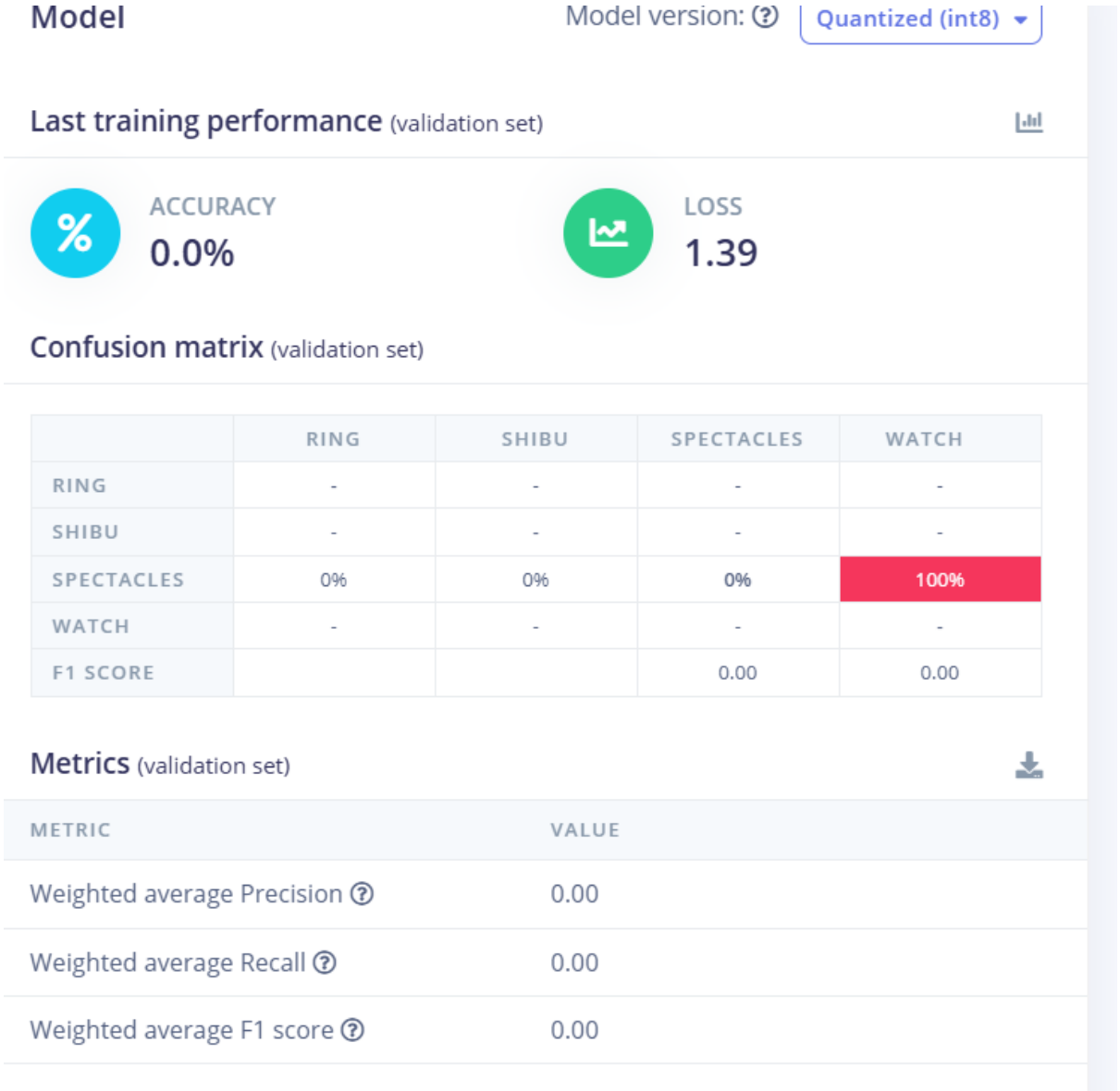
Setup

- This is the impulse setup I used at first
- It is a classification problem with the goal of classifying the images
- One critical detail that I failed to account for is that I had a few images where their labels where present in the train dataset but not on test dataset. This would be a glaring issue during validation training



Training

- The model was at 0% accuracy as expected as the number of data was too small and the train split was poor
- Even during the feature extraction step. Only 1 window was created
- Overall this version was a failure



Model

Model version: Quantized (int8)

Last training performance (validation set)

ACCURACY
0.0%

LOSS
1.39

Confusion matrix (validation set)

	RING	SHIBU	SPECTACLES	WATCH
RING	-	-	-	-
SHIBU	-	-	-	-
SPECTACLES	0%	0%	0%	100%
WATCH	-	-	-	-
F1 SCORE			0.00	0.00

Metrics (validation set)

METRIC	VALUE
Weighted average Precision	0.00
Weighted average Recall	0.00
Weighted average F1 score	0.00

Attempt 2

(My attempt at trying to develop a decent model)

The Idea:

- The biggest reason as to why my initial model failed was due to the lack of images
- Especially when considering 4 classes
- Furthermore, this second attempt was performed back at my hostel room so I couldn't add further training data (background differs considerably, will affect the model since overall it will remain small even if it's with 200 images, so it's essential for all images in a particular label to look as similar as possible)
- This prompted me into reducing the amount of labels to two : spectacles and not spectacles, essentially making it a binary classification problem
- This would assign enough images to the two classes and also simplify the problem at hand

DATA COLLECTED

13 items

TRAIN / TEST SPLIT

85% / 15%

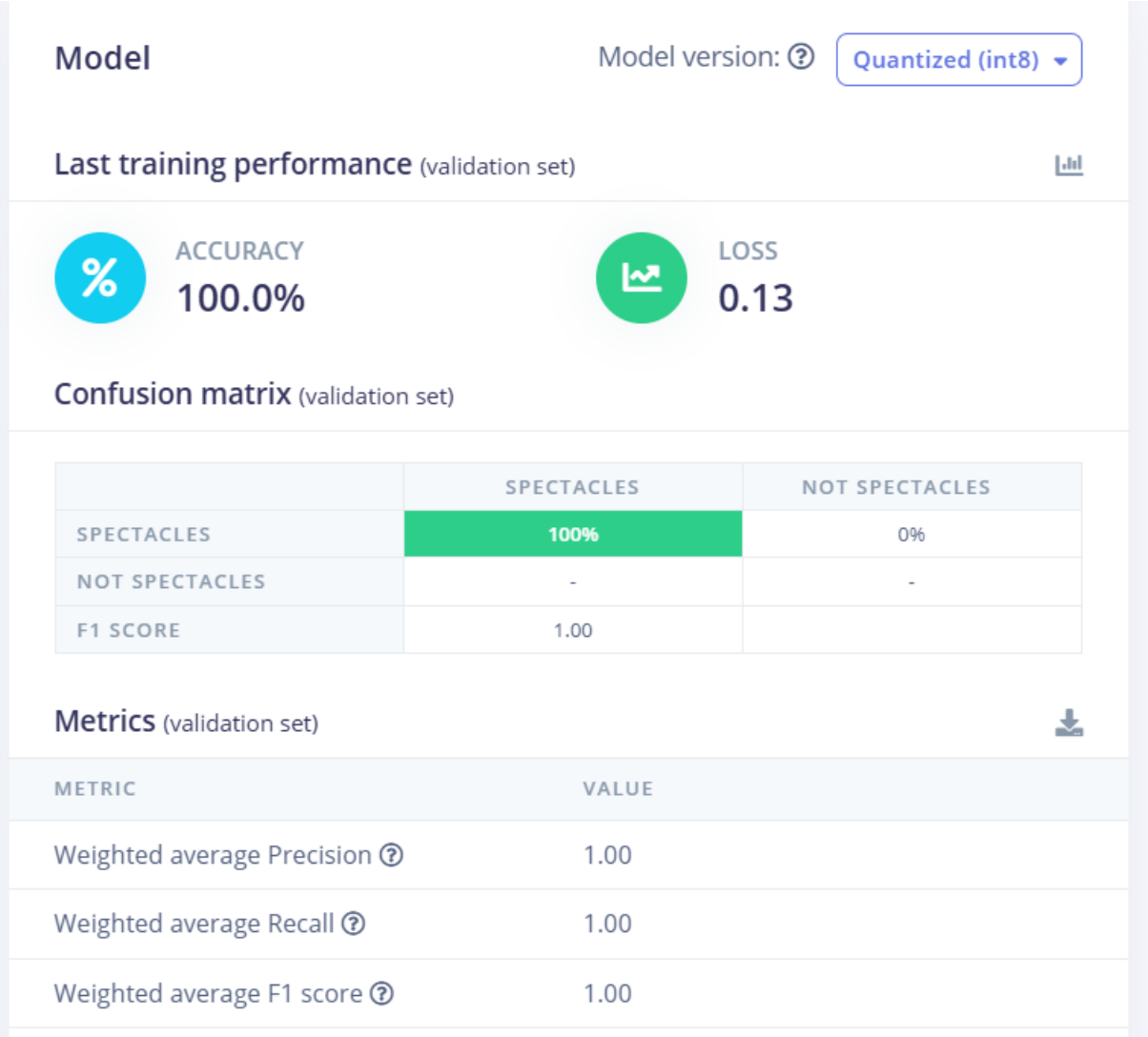
Dataset

Training (11) Test (2)

SAMPLE NAME	LABEL	ADDED
Watch.6ebb0ifn	not spectacles	Today, 18:54:06
Ring.6ebb3bi2	not spectacles	Today, 18:47:32
Spectacles.6ebasb0s	Spectacles	Today, 18:58:52
Spectacles.6ebb8kst	Spectacles	Today, 18:58:56
Ring.6ebb3bi2	not spectacles	Today, 18:50:35
Watch.6ebb0ifn	not spectacles	Jan 08 2026, 17...
Watch.6ebavvut	not spectacles	Jan 08 2026, 17...
Shibu.6ebaud59	not spectacles	Jan 08 2026, 17...

The Result:

- Surprisingly the model is now at a 100% accuracy
- It is able to correctly distinguish between what is a spectacle and what isn't
- This is largely due to the model now having to classify an image between two labels only
- This is a simpler process yes, but this was the only solution that I could come up with without having to add additional images as data



Metrics (validation set)

METRIC	VALUE
Weighted average Precision	1.00
Weighted average Recall	1.00
Weighted average F1 score	1.00

Data explorer (full training set)

On-device performance

Engine: EON™ Compiler

INFERENCING ...	PEAK RAM USA...	FLASH USAGE
552 ms.	182.8K	70.4K