

Output Ejercicio 1 Lab 3: TinyML

1. Tiempo de inferencia en el ejemplo “*hello_world*” de TensorFlow Lite Micro:

```
I (232) heap_init: At 3FFB34F8 len 0002CB08 (178 KiB): DRAM
I (237) heap_init: At 3FFE0440 len 00003AE0 (14 KiB): D/IRAM
I (242) heap_init: At 3FFE4350 len 0001BCB0 (111 KiB): D/IRAM
I (248) heap_init: At 40008BDA8 len 00014258 (80 KiB): IRAM
I (254) spi_flash: detected chip: generic
I (257) spi_flash: flash io: qio
W (260) spi_flash: Detected size(4096k) larger than the size in the binary image header(2048k). Using the size in the binary image header.
I (272) main_task: Started on CPU0
I (282) main_task: Calling app_main()
I (282) app_main: Starting inference...
Inference time (us): 124 us
x_value: 0.000000, y_value: 0.000000
I (282) app_main: Inference completed.
I (782) app_main: Starting inference...
Inference time (us): 71 us
x_value: 0.314159, y_value: 0.372770
I (782) app_main: Inference completed.
I (1282) app_main: Starting inference...
Inference time (us): 64 us
x_value: 0.628319, y_value: 0.559154
I (1282) app_main: Inference completed.
I (1782) app_main: Starting inference...
Inference time (us): 63 us
x_value: 0.942478, y_value: 0.838731
I (1782) app_main: Inference completed.
I (2282) app_main: Starting inference...
Inference time (us): 64 us
x_value: 1.256637, y_value: 0.965812
I (2282) app_main: Inference completed.
I (2782) app_main: Starting inference...
Inference time (us): 65 us
x_value: 1.570796, y_value: 1.042060
I (2782) app_main: Inference completed.
I (3282) app_main: Starting inference...
Inference time (us): 65 us
x_value: 1.884956, y_value: 0.957340
I (3282) app_main: Inference completed.
I (3782) app_main: Starting inference...
Inference time (us): 65 us
x_value: 2.199115, y_value: 0.821787
I (3782) app_main: Inference completed.
I (4282) app_main: Starting inference...
Inference time (us): 65 us
x_value: 2.513274, y_value: 0.533738
I (4282) app_main: Inference completed.
I (4782) app_main: Starting inference...
Inference time (us): 65 us
x_value: 2.827433, y_value: 0.237217
I (4782) app_main: Inference completed.
```

2. Tiempo de inferencia “*new hello world*”, implementación propia de algoritmo de “*hello world*”:

```
I (255) spi_flash: detected chip: generic
I (257) spi_flash: flash io: dio
W (260) spi_flash: Detected size(4096k) larger than the size in the binary image header(2048k). Using the size in the binary image header.
I (273) main_task: Started on CPU0
I (283) main_task: Calling app_main()
x = -1.000 -> y = -1.043299, tiempo = 89 us
x = -0.778 -> y = -0.808003, tiempo = 54 us
x = -0.556 -> y = -0.568846, tiempo = 53 us
x = -0.333 -> y = -0.330746, tiempo = 54 us
x = -0.111 -> y = -0.092645, tiempo = 54 us
x = 0.111 -> y = 0.113426, tiempo = 53 us
x = 0.333 -> y = 0.308032, tiempo = 54 us
x = 0.556 -> y = 0.502638, tiempo = 53 us
x = 0.778 -> y = 0.692708, tiempo = 54 us
x = 1.000 -> y = 0.863042, tiempo = 54 us
I (313) main_task: Returned from app_main()
```

3. Tabla comparativa de los dos modelos:

Métrica	<i>hello_world</i>	<i>new_hw</i>	Rendimiento	Conclusión
Promedio típico (sin 1ª inferencia)	64 – 65 μ s	53 – 54 μ s	<i>new_hw</i>	El modelo en C es ligeramente más rápido (~ 10 μ s menos)
Primera inferencia	~ 71 μ s	~ 89 μ s	<i>hello_world</i>	
Variación	Baja	Muy baja	<i>new_hw</i>	

- El primer ciclo es más lento en ambos casos por efectos de inicialización de caché o entorno.