RESUMEN RESULTADOS MODELOS ENTRENADOS

Frutas:

- Primer modelo (hiperparámetros arbitrarios)

    - Arquitectura

Layer (type)	Output Shape	Param #
Capa_Reescalado (Rescaling)	(None, 256, 256, 3)	0
Capa_Convolucional_1 (Conv2D)	(None, 254, 254, 64)	1,792
Max_Pool_1 (MaxPooling2D)	(None, 127, 127, 64)	0
Capa_Convolucional_2 (Conv2D)	(None, 125, 125, 128)	73,856
Avg_Pool_1 (AveragePooling2D)	(None, 62, 62, 128)	0
Capa_Convolucional_3 (Conv2D)	(None, 60, 60, 256)	295,168
Flatten_Layer (Flatten)	(None, 921600)	0
Capa_Densa_1 (Dense)	(None, 128)	117,964,928
Capa_Densa_2 (Dense)	(None, 64)	8,256
Capa_Respuesta (Dense)	(None, 19)	1,235

Total params: 118,345,235 (451.45 MB)
Trainable params: 118,345,235 (451.45 MB)
Non-trainable params: 0 (0.00 B)

    - Resultados sobre los datos de entrenamiento para cada clase

	precision	recall	f1-score	support
Apple	1.00	0.95	0.97	278
Avocado	1.00	1.00	1.00	41
Banana	0.92	1.00	0.96	45
Kiwi	1.00	0.96	0.98	46
Lemon	0.98	1.00	0.99	42
Lime	1.00	1.00	1.00	31
Mango	1.00	1.00	1.00	32
Melon	0.99	0.99	0.99	154
Nectarine	1.00	1.00	1.00	36
Orange	1.00	0.98	0.99	57
Papaya	1.00	1.00	1.00	21
Passion-Fruit	1.00	1.00	1.00	28
Peach	1.00	1.00	1.00	37
Pear	0.99	1.00	1.00	116
Pineapple	1.00	1.00	1.00	26
Plum	1.00	1.00	1.00	22
Pomegranate	0.76	1.00	0.87	26
Red-Grapefruit	0.97	1.00	0.99	34
Satsumas	0.99	1.00	0.99	70
micro avg	0.98	0.98	0.98	1142
macro avg	0.98	0.99	0.99	1142
weighted avg	0.99	0.98	0.98	1142
samples avg	0.98	0.98	0.98	1142

- Resultados para los datos de test para cada clase

	precision	recall	f1-score	support
Apple	0.50	0.32	0.39	276
Avocado	0.20	0.28	0.23	40
Banana	0.09	0.23	0.13	44
Kiwi	0.24	0.18	0.20	45
Lemon	0.12	0.24	0.17	41
Lime	0.62	0.17	0.26	30
Mango	0.13	0.06	0.09	31
Melon	0.38	0.40	0.39	153
Nectarine	0.00	0.00	0.00	35
Orange	0.20	0.20	0.20	56
Papaya	0.00	0.00	0.00	21
Passion-Fruit	0.29	0.15	0.20	27
Peach	0.12	0.08	0.10	36
Pear	0.21	0.27	0.24	108
Pineapple	0.14	0.04	0.06	25
Plum	0.10	0.05	0.06	22
Pomegranate	0.04	0.12	0.06	25
Red-Grapefruit	0.15	0.18	0.16	34
Satsumas	0.49	0.59	0.54	68
micro avg	0.26	0.26	0.26	1117
macro avg	0.21	0.19	0.18	1117
weighted avg	0.30	0.26	0.27	1117
samples avg	0.26	0.26	0.26	1117

- Segundo modelo (búsqueda de hiperparámetros)
  - Arquitectura

Layer (type)	Output Shape	Param #
Reescalado (Rescaling)	(None, 256, 256, 3)	0
Convolucional_1 (Conv2D)	(None, 254, 254, 32)	896
MaxPooling_1 (MaxPooling2D)	(None, 127, 127, 32)	0
Convolucional_2 (Conv2D)	(None, 125, 125, 192)	55,488
MaxPooling_2 (MaxPooling2D)	(None, 62, 62, 192)	0
Convolucional_3 (Conv2D)	(None, 60, 60, 128)	221,312
MaxPooling_3 (MaxPooling2D)	(None, 30, 30, 128)	0
Flatten (Flatten)	(None, 115200)	0
Densa (Dense)	(None, 64)	7,372,864
Salida (Dense)	(None, 19)	1,235

Total params: 7,651,797 (29.19 MB)

Trainable params: 7,651,795 (29.19 MB)

Non-trainable params: 0 (0.00 B)

Optimizer params: 2 (12.00 B)

- Resultados sobre los datos de entrenamiento para cada clase

	precision	recall	f1-score	support
Apple	0.77	0.85	0.81	278
Avocado	1.00	0.63	0.78	41
Banana	1.00	0.02	0.04	45
Kiwi	1.00	0.52	0.69	46
Lemon	0.74	0.60	0.66	42
Lime	1.00	0.29	0.45	31
Mango	0.67	0.06	0.11	32
Melon	0.85	0.75	0.80	154
Nectarine	0.94	0.86	0.90	36
Orange	0.97	0.67	0.79	57
Papaya	1.00	0.05	0.09	21
Passion-Fruit	1.00	0.86	0.92	28
Peach	1.00	0.51	0.68	37
Pear	0.95	0.30	0.46	116
Pineapple	0.74	0.77	0.75	26
Plum	1.00	0.95	0.98	22
Pomegranate	1.00	0.31	0.47	26
Red-Grapefruit	0.69	0.74	0.71	34
Satsumas	0.88	0.96	0.92	70
micro avg	0.84	0.64	0.73	1142
macro avg	0.91	0.56	0.63	1142
weighted avg	0.87	0.64	0.69	1142
samples avg	0.64	0.64	0.64	1142

- Resultados sobre los datos de test para cada clase

	precision	recall	f1-score	support
Apple	0.59	0.68	0.63	276
Avocado	0.00	0.00	0.00	40
Banana	0.00	0.00	0.00	44
Kiwi	0.60	0.07	0.12	45
Lemon	0.30	0.15	0.20	41
Lime	1.00	0.03	0.06	30
Mango	0.00	0.00	0.00	31
Melon	0.50	0.35	0.41	153
Nectarine	0.44	0.46	0.45	35
Orange	0.33	0.20	0.25	56
Papaya	0.00	0.00	0.00	21
Passion-Fruit	0.40	0.15	0.22	27
Peach	1.00	0.06	0.11	36
Pear	0.31	0.05	0.08	108
Pineapple	0.13	0.08	0.10	25
Plum	0.40	0.09	0.15	22
Pomegranate	0.00	0.00	0.00	25
Red-Grapefruit	0.14	0.18	0.16	34
Satsumas	0.51	0.47	0.49	68
micro avg	0.48	0.30	0.37	1117
macro avg	0.35	0.16	0.18	1117
weighted avg	0.43	0.30	0.31	1117
samples avg	0.30	0.30	0.30	1117

Vegetales:

- Primer modelo (hiperparámetros arbitrarios)

  - Arquitectura

Layer (type)	Output Shape	Param #
Capa_Reescalado (Rescaling)	(None, 256, 256, 3)	0
Capa_Convolucional_1 (Conv2D)	(None, 254, 254, 64)	1,792
Max_Pool_1 (MaxPooling2D)	(None, 127, 127, 64)	0
Capa_Convolucional_2 (Conv2D)	(None, 125, 125, 128)	73,856
Avg_Pool_1 (AveragePooling2D)	(None, 62, 62, 128)	0
Capa_Convolucional_3 (Conv2D)	(None, 60, 60, 256)	295,168
Flatten_Layer (Flatten)	(None, 921600)	0
Capa_Densa_1 (Dense)	(None, 128)	117,964,928
Capa_Densa_2 (Dense)	(None, 64)	8,256
Capa_Respuesta (Dense)	(None, 15)	975

Total params: 118,344,975 (451.45 MB)

Trainable params: 118,344,975 (451.45 MB)

Non-trainable params: 0 (0.00 B)

- Resultados sobre los datos de entrenamiento para cada clase

	precision	recall	f1-score	support
Asparagus	1.00	1.00	1.00	16
Aubergine	1.00	1.00	1.00	22
Cabbage	0.86	1.00	0.93	19
Carrots	1.00	0.98	0.99	43
Cucumber	1.00	1.00	1.00	28
Garlic	1.00	0.96	0.98	25
Ginger	1.00	0.89	0.94	19
Leek	1.00	0.96	0.98	23
Mushroom	1.00	1.00	1.00	39
Onion	1.00	0.39	0.57	38
Pepper	1.00	0.74	0.85	112
Potato	0.72	1.00	0.84	75
Red-Beet	1.00	0.89	0.94	18
Tomato	0.83	1.00	0.91	127
Zucchini	0.97	1.00	0.98	30
micro avg	0.91	0.91	0.91	634
macro avg	0.96	0.92	0.93	634
weighted avg	0.93	0.91	0.90	634
samples avg	0.91	0.91	0.91	634

- Resultados para los datos de test para cada clase

	precision	recall	f1-score	support
Asparagus	0.23	0.21	0.22	14
Aubergine	0.31	0.41	0.35	22
Cabbage	0.38	0.79	0.51	19
Carrots	0.67	0.69	0.68	42
Cucumber	0.63	0.63	0.63	27
Garlic	0.58	0.56	0.57	25
Ginger	0.00	0.00	0.00	15
Leek	0.50	0.29	0.36	21
Mushroom	0.57	0.21	0.30	39
Onion	0.00	0.00	0.00	37
Pepper	0.78	0.39	0.52	110
Potato	0.38	0.97	0.55	70
Red-Beet	0.50	0.12	0.19	17
Tomato	0.74	0.89	0.81	100
Zucchini	0.48	0.34	0.40	29
micro avg	0.53	0.53	0.53	587
macro avg	0.45	0.43	0.41	587
weighted avg	0.54	0.53	0.50	587
samples avg	0.53	0.53	0.53	587

- Segundo modelo (búsqueda de hiperparámetros)
  - Arquitectura

Layer (type)	Output Shape	Param #
Reescalado (Rescaling)	(None, 256, 256, 3)	0
Convolucional_1 (Conv2D)	(None, 254, 254, 32)	896
MaxPooling_1 (MaxPooling2D)	(None, 127, 127, 32)	0
Convolucional_2 (Conv2D)	(None, 125, 125, 192)	55,488
MaxPooling_2 (MaxPooling2D)	(None, 62, 62, 192)	0
Convolucional_3 (Conv2D)	(None, 60, 60, 128)	221,312
MaxPooling_3 (MaxPooling2D)	(None, 30, 30, 128)	0
Flatten (Flatten)	(None, 115200)	0
Densa (Dense)	(None, 64)	7,372,864
Salida (Dense)	(None, 15)	975

Total params: 7,651,535 (29.19 MB)
Trainable params: 7,651,535 (29.19 MB)
Non-trainable params: 0 (0.00 B)

  - Resultados sobre los datos de entrenamiento para cada clase

	precision	recall	f1-score	support
Asparagus	1.00	0.12	0.22	16
Aubergine	1.00	1.00	1.00	22
Cabbage	1.00	0.74	0.85	19
Carrots	1.00	1.00	1.00	43
Cucumber	1.00	0.96	0.98	28
Garlic	0.95	0.80	0.87	25
Ginger	0.92	0.58	0.71	19
Leek	0.96	0.96	0.96	23
Mushroom	0.97	1.00	0.99	39
Onion	0.97	0.95	0.96	38
Pepper	0.94	1.00	0.97	112
Potato	0.99	0.89	0.94	75
Red-Beet	1.00	0.89	0.94	18
Tomato	1.00	1.00	1.00	127
Zucchini	0.81	1.00	0.90	30
micro avg	0.97	0.93	0.95	634
macro avg	0.97	0.86	0.89	634
weighted avg	0.97	0.93	0.94	634
samples avg	0.93	0.93	0.93	634

- Resultados sobre los datos de test para cada clase

	precision	recall	f1-score	support
Asparagus	0.00	0.00	0.00	14
Aubergine	0.91	0.45	0.61	22
Cabbage	0.88	0.37	0.52	19
Carrots	0.82	0.74	0.78	42
Cucumber	0.82	0.33	0.47	27
Garlic	0.81	0.68	0.74	25
Ginger	0.20	0.07	0.10	15
Leek	0.67	0.48	0.56	21
Mushroom	0.28	0.41	0.33	39
Onion	0.23	0.14	0.17	37
Pepper	0.60	0.64	0.62	110
Potato	0.72	0.33	0.45	70
Red-Beet	0.67	0.12	0.20	17
Tomato	0.72	0.79	0.76	100
Zucchini	0.51	0.69	0.59	29
micro avg	0.61	0.51	0.56	587
macro avg	0.59	0.41	0.46	587
weighted avg	0.62	0.51	0.54	587
samples avg	0.51	0.51	0.51	587

Empaques:

- Primer modelo (hiperparámetros arbitrarios)

  - Arquitectura

Layer (type)	Output Shape	Param #
Capa_Reescalado (Rescaling)	(None, 256, 256, 3)	0
Capa_Convolucional_1 (Conv2D)	(None, 254, 254, 64)	1,792
Max_Pool_1 (MaxPooling2D)	(None, 127, 127, 64)	0
Capa_Convolucional_2 (Conv2D)	(None, 125, 125, 128)	73,856
Avg_Pool_1 (AveragePooling2D)	(None, 62, 62, 128)	0
Capa_Convolucional_3 (Conv2D)	(None, 60, 60, 256)	295,168
Flatten_Layer (Flatten)	(None, 921600)	0
Capa_Densa_1 (Dense)	(None, 128)	117,964,928
Capa_Densa_2 (Dense)	(None, 64)	8,256
Capa_Respuesta (Dense)	(None, 9)	585

Total params: 118,344,585 (451.45 MB)
Trainable params: 118,344,585 (451.45 MB)
Non-trainable params: 0 (0.00 B)

  - Resultados sobre los datos de entrenamiento para cada clase

	precision	recall	f1-score	support
Juice	0.97	1.00	0.99	176
Milk	0.98	1.00	0.99	64
Oat-Milk	0.94	1.00	0.97	32
Oatghurt	0.97	1.00	0.99	33
Sour-Cream	0.95	1.00	0.97	19
Sour-Milk	1.00	1.00	1.00	30
Soy-Milk	1.00	1.00	1.00	60
Soyghurt	0.98	1.00	0.99	51
Yoghurt	1.00	0.93	0.96	155
micro avg	0.98	0.98	0.98	620
macro avg	0.98	0.99	0.98	620
weighted avg	0.98	0.98	0.98	620
samples avg	0.98	0.98	0.98	620

  - Resultados para los datos de test para cada clase

	precision	recall	f1-score	support
Juice	0.68	0.83	0.75	167
Milk	0.59	0.62	0.61	64
Oat-Milk	0.45	0.68	0.54	31
Oatghurt	0.22	0.17	0.19	30
Sour-Cream	0.60	0.33	0.43	18
Sour-Milk	0.38	0.26	0.31	19
Soy-Milk	0.77	0.71	0.74	58
Soyghurt	0.58	0.68	0.63	47
Yoghurt	0.70	0.52	0.60	149
micro avg	0.63	0.63	0.63	583
macro avg	0.55	0.53	0.53	583
weighted avg	0.63	0.63	0.62	583
samples avg	0.63	0.63	0.63	583

- Segundo modelo (búsqueda de hiperparámetros)
  - Arquitectura

Layer (type)	Output Shape	Param #
Reescalado (Rescaling)	(None, 256, 256, 3)	0
Convolucional_1 (Conv2D)	(None, 254, 254, 32)	896
MaxPooling_1 (MaxPooling2D)	(None, 127, 127, 32)	0
Convolucional_2 (Conv2D)	(None, 125, 125, 64)	18,496
MaxPooling_2 (MaxPooling2D)	(None, 62, 62, 64)	0
Convolucional_3 (Conv2D)	(None, 58, 58, 128)	204,928
MaxPooling_3 (MaxPooling2D)	(None, 29, 29, 128)	0
Flatten (Flatten)	(None, 107648)	0
Densa (Dense)	(None, 128)	13,779,072
Salida (Dense)	(None, 9)	1,161

Total params: 14,004,553 (53.42 MB)

Trainable params: 14,004,553 (53.42 MB)

Non-trainable params: 0 (0.00 B)

  - Resultados sobre los datos de entrenamiento para cada clase

	precision	recall	f1-score	support
Juice	1.00	0.98	0.99	176
Milk	0.96	1.00	0.98	64
Oat-Milk	1.00	1.00	1.00	32
Oatghurt	1.00	1.00	1.00	33
Sour-Cream	1.00	1.00	1.00	19
Sour-Milk	1.00	1.00	1.00	30
Soy-Milk	1.00	1.00	1.00	60
Soyghurt	1.00	1.00	1.00	51
Yoghurt	0.99	1.00	1.00	155
micro avg	0.99	0.99	0.99	620
macro avg	0.99	1.00	1.00	620
weighted avg	0.99	0.99	0.99	620
samples avg	0.99	0.99	0.99	620

- Resultados sobre los datos de test para cada clase

	precision	recall	f1-score	support
Juice	0.76	0.72	0.74	167
Milk	0.51	0.84	0.64	64
Oat-Milk	0.47	0.74	0.57	31
Oatghurt	0.55	0.20	0.29	30
Sour-Cream	0.00	0.00	0.00	18
Sour-Milk	0.54	0.68	0.60	19
Soy-Milk	0.89	0.69	0.78	58
Soyghurt	0.81	0.64	0.71	47
Yoghurt	0.74	0.71	0.73	149
micro avg	0.69	0.67	0.68	583
macro avg	0.59	0.58	0.56	583
weighted avg	0.69	0.67	0.67	583
samples avg	0.67	0.67	0.67	583