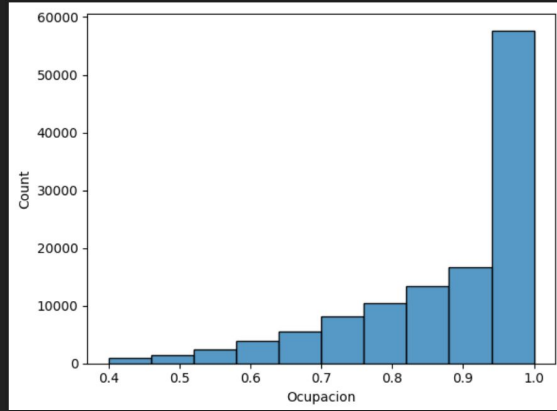


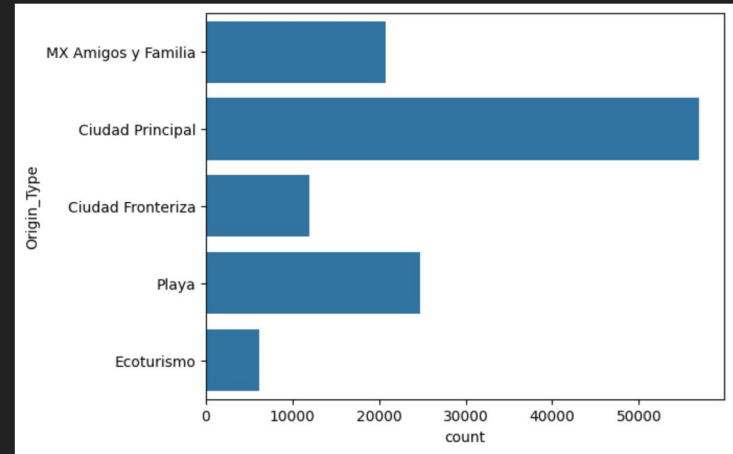
Reto Viva

Equipo: Metric Magicians

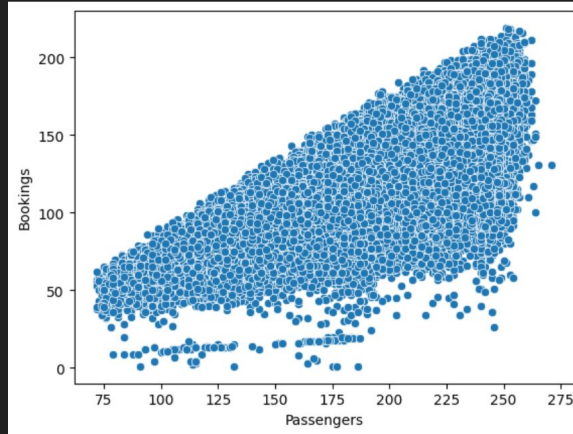
Porcentaje de ocupación



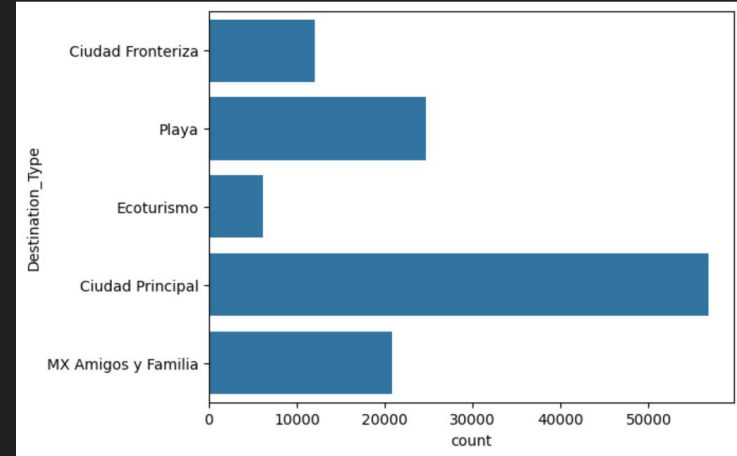
Origen



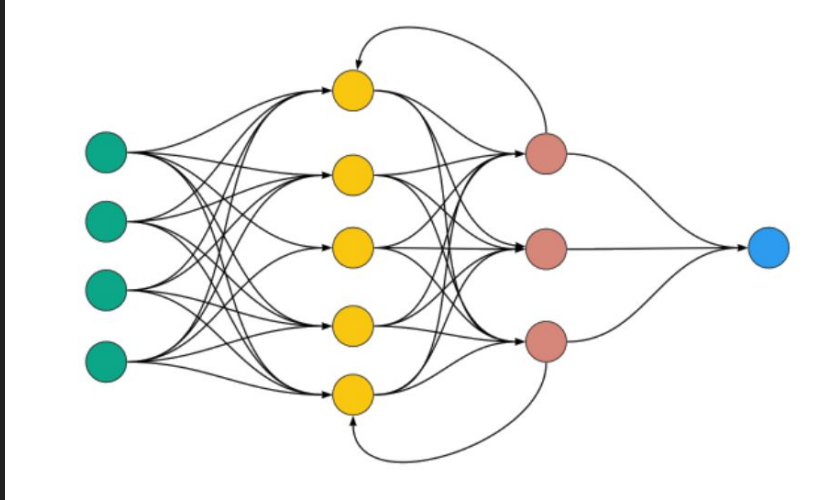
Passengers x Bookings



Destino



Primer Modelo: Predicción de Pasajeros



Redes Neuronales Recurrentes

Input: Variables

- Rutas_Nuevas
- Tiempo_En_Minutos
- Ocupacion
- Bookings
- Capacity
- Sobrevendido
- Ciudad Fronteriza_O
- Ciudad Principal_O
- Mx Amigos Y Familia_O
- Mx Amigos Y Familia_D
- Ciudad Fronteriza_D
- Ciudad Principal_D
- January

Output: Pasajeros

Modelo

```
[31] ✓ 2.9s  
... 377/377 ————— 3s 6ms/step  
... array([196.29611, 198.9517 , 202.0973 , ..., 165.50397, 165.29048,  
         174.36533], dtype=float32)
```

```
y_test  
[32] ✓ 0.0s  
... array([208., 242., 187., ..., 217., 168., 161.]
```

Pruebas con 10 épocas



```
[26] ✓ 4.3s  
... 377/377 ————— 4s 6ms/step  
... array([190.70244, 182.12401, 173.41301, ..., 194.0724 , 204.45592,  
         198.036 ], dtype=float32)
```

```
▷ y_test  
[27] ✓ 0.0s  
... array([208., 242., 187., ..., 217., 168., 161.]
```

Pruebas con 20 épocas



Predicciones para 1 día.

Datos.

```
array([208., 242., 187., ..., 217., 168., 161.]
```

Predicción.

```
array([200.37656, 202.87773, 201.0108 , ..., 170.98737, 146.6505 ,  
       155.186   ], dtype=float32)
```

Predicciones para 7 días.

Datos

	0	1	2	3	4	5	6
0	186.039459	184.493134	186.508224	187.018997	184.721466	187.121658	187.396072
1	188.646667	187.167801	188.955124	189.385986	186.681076	188.898880	188.865356
2	186.396851	184.896423	186.970215	187.454071	185.070328	187.426666	187.517441
3	192.190704	190.786591	192.495758	192.850754	189.745056	191.831619	191.423508
4	191.469147	190.087952	191.831573	192.181610	189.165726	191.288986	190.955765

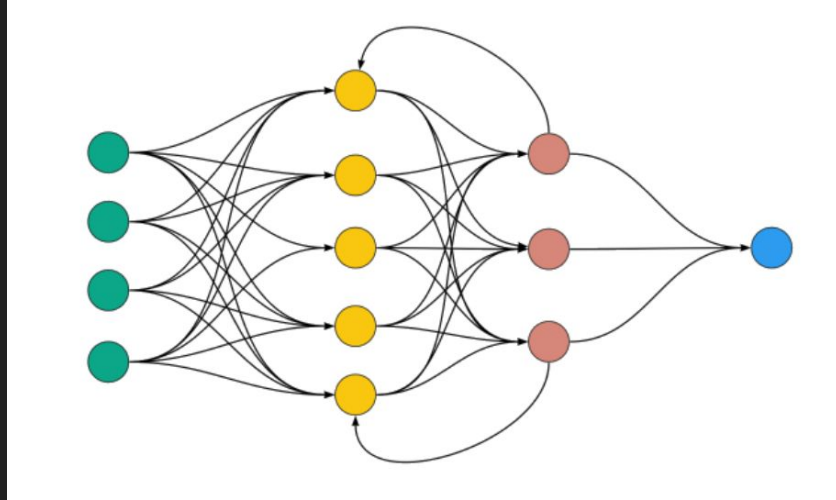
Predicción

	0	1	2	3	4	5	6
0	151.0	201.0	103.0	170.0	166.0	151.0	208.0
1	201.0	103.0	170.0	166.0	151.0	208.0	242.0
2	103.0	170.0	166.0	151.0	208.0	242.0	187.0
3	170.0	166.0	151.0	208.0	242.0	187.0	164.0
4	166.0	151.0	208.0	242.0	187.0	164.0	220.0

Segundo Modelo: Predicción de Pasajeros

Redes Neuronales Recurrentes

Input: Variables



Output: Quantity

- Passengers
- Rutas_Nuevas
- Tiempo_En_Minutos
- Ocupacion
- Bookings
- Capacity
- Sobrevendido
- July
- February
- Matutino
- Ciudad
- Fronteriza_O
- Ciudad Principal_O
- Mx Amigos Y
- Familia_D
- Ciudad
- Fronteriza_D
- Ciudad Principal_D
- August
- Nocturno
- Playa_D
- Ecoturismo D
- Ecoturismo O

Modelo con output de 1 dia

```
history = model.fit(X_train, y_train, epochs=12, batch_size=30, validation_data=(X_val, y_val), verbose=1)

plt.plot(history.history['loss'], label='Training loss')
plt.plot(history.history['val_loss'], label='Validation loss')
plt.legend()
```

```
Epoch 1/12
4844/4844 [=====] - 192s 36ms/step - loss: 3.7451 - mae: 1.4050 - mse: 3.7451 - v
Epoch 2/12
4844/4844 [=====] - 181s 37ms/step - loss: 3.5099 - mae: 1.3635 - mse: 3.5099 - v
Epoch 3/12
4844/4844 [=====] - 177s 37ms/step - loss: 3.3982 - mae: 1.3425 - mse: 3.3982 - v
Epoch 4/12
4844/4844 [=====] - 177s 36ms/step - loss: 3.3399 - mae: 1.3311 - mse: 3.3399 - v
- - - - -
```

```
predicciones_test = model_loaded.predict(X_test)
predicciones_test[:,0]
```

[64]

Python

```
... 568/568 [=====] - 8s 11ms/step
```

```
... array([2.2119343, 3.570108 , 3.7058954, ..., 1.7082947, 1.7325858,
          1.7539308], dtype=float32)
```

```
y_test
```

[65]

Python

```
... array([1, 3, 2, ..., 3, 2, 1], dtype=int64)
```

Pruebas con 12 épocas



Predicciones para 1 dia.

Datos

	0
0	2.211934
1	3.570108
2	3.705895
3	2.171817
4	2.038439

Predicción

	0
0	1
1	3
2	2
3	1
4	3