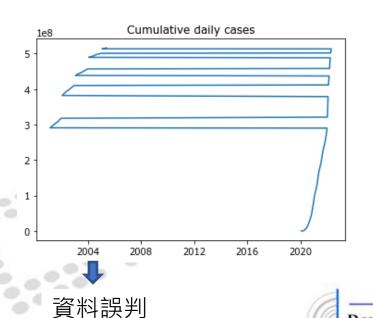


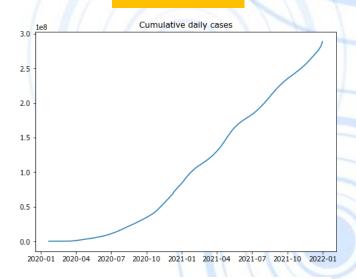
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# 原本covid-19的data格式不一致:



# 整理後: 累積分布



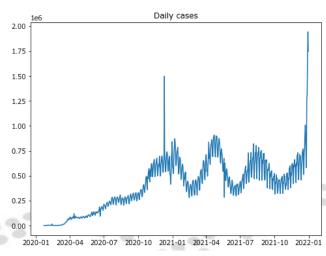
單位:確診人數

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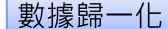


# 整理後:

# 每日值變化



單位:確診人數



轉換後:

[[0.00030536]

[0.00012495]

最小值

[0.00012493]

La aaassace

預處理: (data包成一組)

• 一組含7個序列數據->搭配1個label

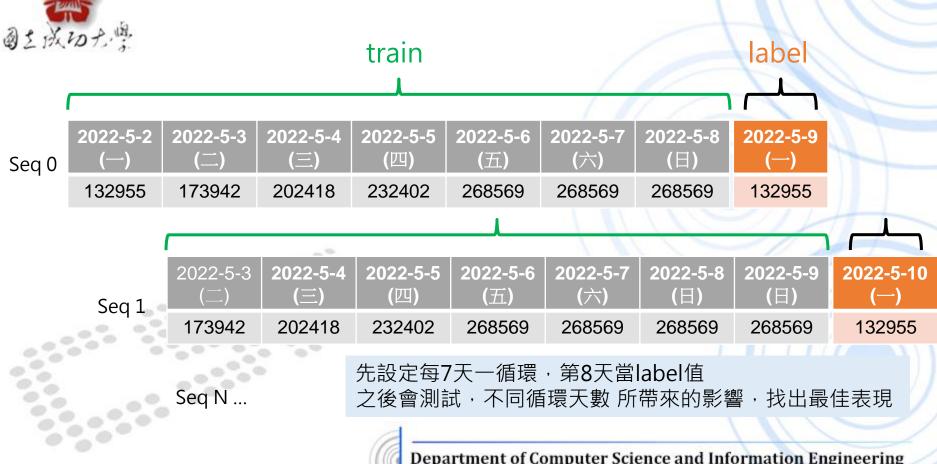


train model

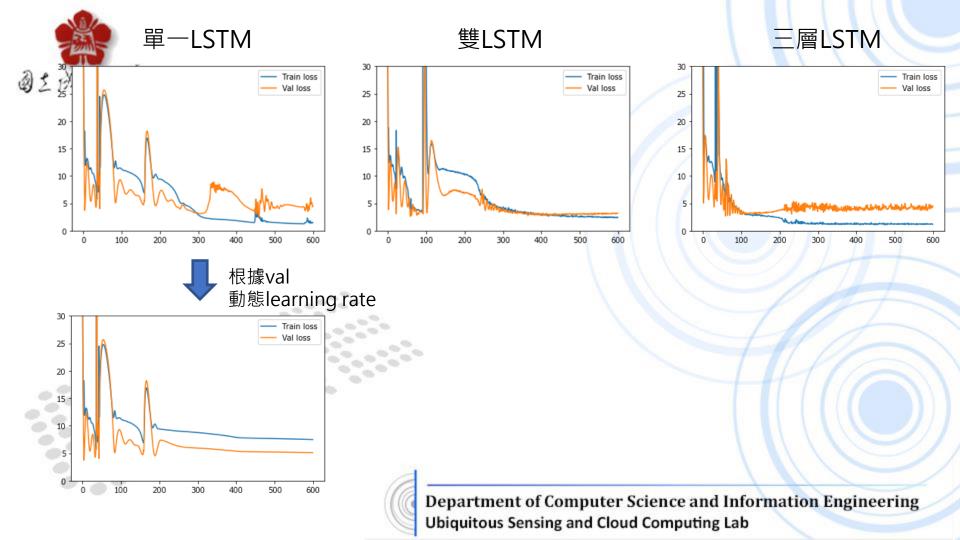
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單位: 全球確診人數(這裡以台灣為例)



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#### 模型評估指標

### MSE, MAE算法:

```
if performance eval == 'MAE': # https://pytorch.org/docs/stable/gener
   evaluation func = torch.nn.L1Loss(reduction='mean') # (平均絕對誤
   best evaluation = 1.0 # 初始最高,越低越好
elif performance_eval == 'MSE': # https://pytorch.org/docs/stable/gen
   evaluation_func = torch.nn.MSELoss(reduction='mean') # (均方誤差)
   best evaluation = 1.0 # 初始最高,越低越好
```

#### $R^2$ 算法:

evaluation = 1 - evaluation

$$R^2 = 1 - \frac{SSE}{SST}$$

$$SSE = \sum_{i=1}^{n} (y_i - \hat{y_i})^2$$

$$R^2=1-rac{SSE}{SST}$$
  $SSE=\sum_{i=1}^n(y_i-\hat{y_i})^2$   $SST=SSR+SSE=\sum_{i=1}^n(y_i-ar{y})^2$ 

#### MAPE算法:

evaluation = np.mean(np.abs(val\_label.cpu().numpy() - y\_pred\_val.cpu().numpy()) / np.abs(val\_label.cpu().numpy()))\*100



(Epoch = 500回合)

歸納01

(初始化權重已固定,方便研究比較)

模型評估指標	MSE	MAE	$R^2$	MAPE
LSTM layers = 1	0.0105	0.0733	0.3572	18.88
LSTM layers = 2	0.0110	0.0708	0.3233	17.96
LSTM layers = 3	0.0114	0.0713	0.3005	18.24

### 歸納02

	模型評估指標	MSE	MAE	R <sup>2</sup>	MAPE	
D	LSTM layers = 2 Hidden size = 256	0.0111	0.0721	0.3224	18.43	
0	LSTM layers = 2 Hidden size = 512	0.0110	0.0708	0.3233	17.96	
, (	LSTM layers = 2 Hidden size = 768	0.0129	0.0744	0.2089	18.98	Engineering

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(Epoch = 500回合)

歸納03

(初始化權重已固定,方便研究比較)

模型評估指標	MSE	MAE	$R^2$	MAPE
LSTM layers = 2 Hidden size = 512 Seq_length = 3	0.0169	0.0849	-0.0208	22.31
LSTM layers = 2 Hidden size = 512 Seq_length = 7	0.0110	0.0708	0.3233	17.96
LSTM layers = 2 Hidden size = 512 Seq_length = 14	0.0146	0.0789	0.1131	20.85



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