Welcome to the predictions lab

In this lab you can costumise your graphs and see the predictions

Attendance in emergency at Scotland hospitals dataset

This a case about the attendance fluctuation in emergency rooms in hospitals of Scotland

Part I: The Case

The case wants to solve the problem of:

- Identify the times of the year when activity increases

- To provide evidence to improve patient care and support Scottish Government policy

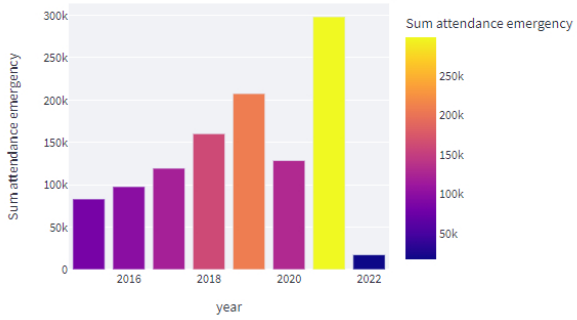
	Week_Ending_Date	Weel	month	year	Seas	Season2	Sum	Difer	Atter	Attenc	Atter	Attenc	Atter	Attenc	Sem	Sem	NHS	NHS_Board_Name	Location_Code	Location_Name
0	22/02/2015 0:00	9	2	2015	0	Winter	203	914	112	1025	112	1026	111	1025	0	0	N	NHS Grampian	N101H	Aberdeen Royal Infirmar
1	01/03/2015 0:00	10	3	2015	0	Winter	163	948	203	914	112	1026	111	1025	1	0	N	NHS Grampian	N101H	Aberdeen Royal Infirmar
2	08/03/2015 0:00	11	3	2015	0	Winter	120	963	163	948	203	914	111	1025	0	1	N	NHS Grampian	N101H	Aberdeen Royal Infirmar
3	15/03/2015 0:00	12	3	2015	0	Winter	126	924	120	963	163	948	203	914	0	0	N	NHS Grampian	N101H	Aberdeen Royal Infirmar
4	22/03/2015 0:00	13	3	2015	0	Winter	141	944	126	924	120	963	163	948	0	0	N	NHS Grampian	N101H	Aberdeen Royal Infirmar

Part II: Stats

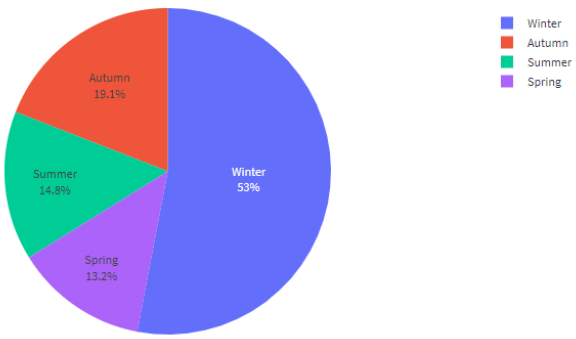
Some statistical graphs that give us a little context of the assists

Overview of the distributions by year and seasons

Attendance in emergencies per year

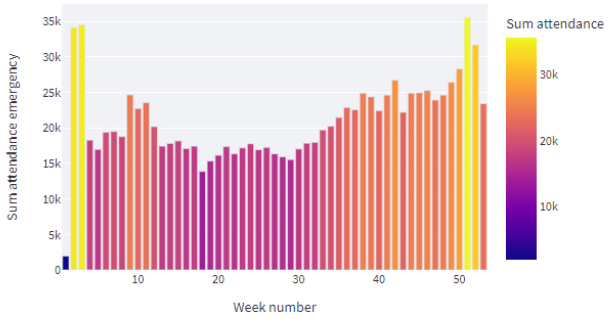


Attendance in emergencies by seasons of the year

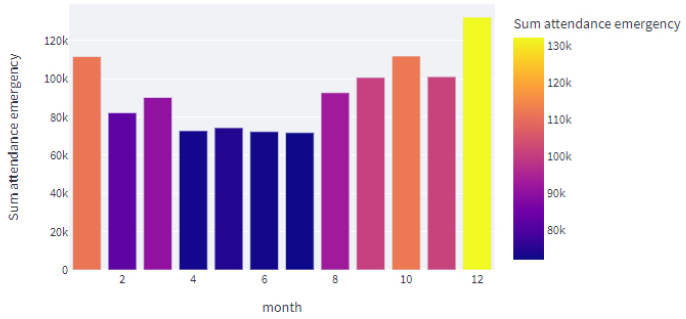


Overview by weeks and months of the year

Attendance by weeks of the year

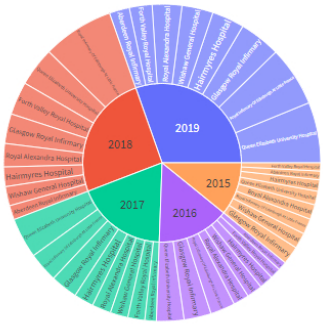


Attendance by months of the year

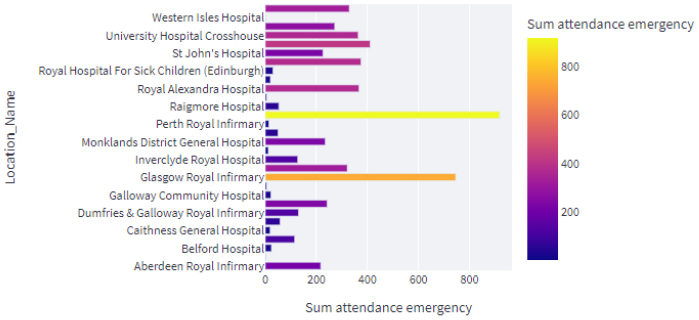


Overview of attendance before and after COVID

Attendance per location per year before 2020

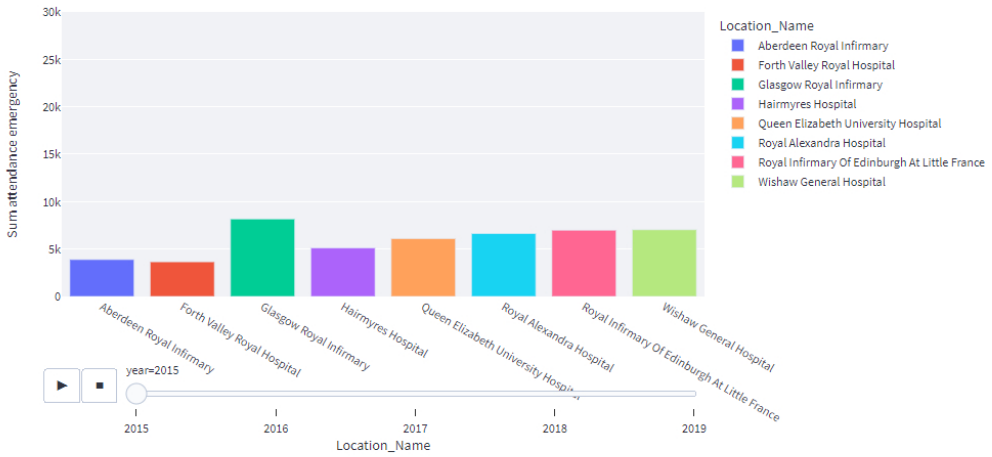


Attendance per location in 2020



Animation of attendance per location per year before 2020 without NHSScotland

Overview of attendance before COVID



Part III: Predictions

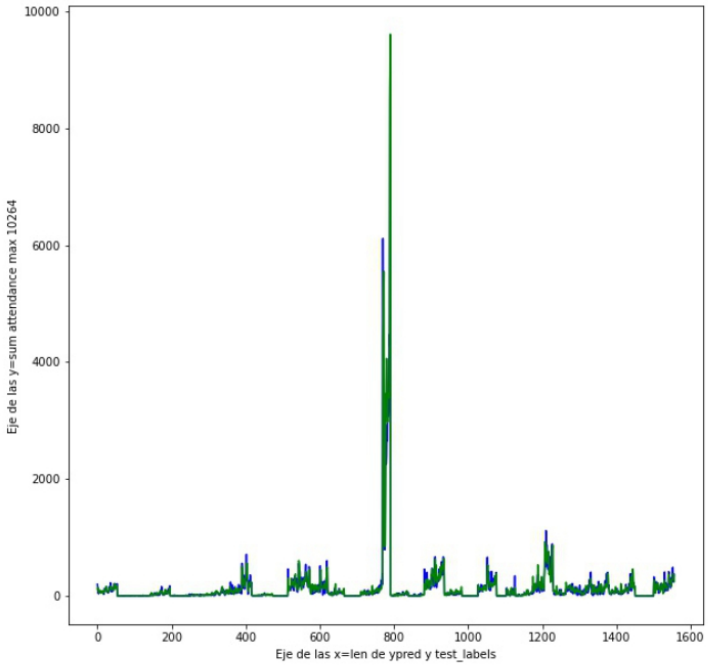
Architecture of the neural network model

Architecture of the neural network model

MAE = 39.34

Acc=72.49154310960036 Err=27.50845689039964

```
Model: "sequential"
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
dense (Dense)                (None, 80)                560
dropout (Dropout)            (None, 80)                0
dense_1 (Dense)              (None, 64)                5184
dense_2 (Dense)              (None, 32)                2080
dropout_1 (Dropout)          (None, 32)                0
dense_3 (Dense)              (None, 16)                528
dense_4 (Dense)              (None, 8)                 136
dense_5 (Dense)              (None, 6)                 54
dense_6 (Dense)              (None, 1)                 7
=================================================================
Total params: 8,549
Trainable params: 8,549
Non-trainable params: 0
_________________________________________________________________
```



I am going to have 80 connections for each variable of the 12 that there are 1040=12x80+80 which are the biases, that in the first layer

the dropout layer deactivates some connections randomly to generalize better, and if we have 0 it is a parameter that does not learn any value

layer two is 64x64, plus the bias is 64, which is one for each neuron

the last layer is 6 because it is a single neuron of 6 variables plus its bias, MxN+Bias

Part IV: The lab

Lets select the variables to predict attendance by hospital

Aberdeen Royal Infirmary: 32-283

Balfour Hospital: 0-17

Belford Hospital: 0-39

Borders General Hospital: 5-177

Caithness General Hospital: 0-29

Dr Gray's Hospital: 2-80

Dumfries & Galloway Royal Infirmary: 5-169

Forth Valley Royal Hospital: 15-716

Galloway Community Hospital: 1-55

Gilbert Bain Hospital: 0-27

Glasgow Royal Infirmary : 60-751

Hairmyres Hospital: 22-640

Inverclyde Royal Hospital: 8-260

Lorn & Islands Hospital: 0-17

Monklands District General Hospital: 9-383

NHSScotland: 631-10264

Ninewells Hospital: 1-140

Perth Royal Infirmary: 0-100

Queen Elizabeth University Hospital: 24-1289

Raigmore Hospital: 10-152

Royal Aberdeen Children's Hospital: 0-17

Royal Alexandra Hospital: 62-666

Royal Hospital For Children: 0-393

Royal Hospital For Sick Children (Edinburgh): 1

Royal Infirmary Of Edinburgh At Little France:

Southern General Hospital: 66-313

St John's Hospital: 13-386

University Hospital Ayr: 7-411

University Hospital Crosshouse: 11-407

Victoria Hospital: 16-310

Victoria Infirmary: 91-434

Western Infirmary: 95-669

Western Isles Hospital: 0-9

Wishaw General Hospital: 29-540

Number_location

Aberdeen Royal Infirmary

Week number

1

1 53

Attendance de la semana anterior en emergencias

0

0 11000

Attendance de hace 2 semanas en emergencias

0

0 11000

Attendance de hace 3 semanas en emergencias

0

0 11000

Pandemic

0

0 1

Predicción