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PREDICTING THE SPREAD OF CORONAVIRUS BY USING WEKA TOOL

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ABSTRACT

2020 was the year of pandemic called Covid-19. The world has never witnessed the lockdown on the global scale that spread like jungle fire but my hunch was whether the predicting of such disease and their spread was possible.

The data mining tool we used for our purpose of predicting is WEKA. The WEKA tool is a collection of machine learning algorithms for data mining tasks. It provides the tools for the data pre-processing, classification, regression, clustering, association rules and visualization. We have used multilayer perception algorithms using the datasets made available by WHO at www.kaggle.com.

We took this task in April 2020 when the datasets related Covid-19 were at earlier stage, but the finding based on our tool's analytics could predict that virus Covid-19 will affect the old age and infants group the most. There two where the easy target due to lack of immunity and our research is proved by the data available now after 9 months / I year of this pandemic . WEKA tools analyze the medical events expertly. In Conclusion, we find out that the effect of Covid-19 is less visible in women and children than in men and the comparison between recoverability of men and women**.**

We find that the possibility of recovery does not depends on on space and genre, it depends only on the patient's immunity systems**.**

Keywords*:* Using Coronavirus diseases (COVID -19) datasets obtained by WHO[1].Middle East Respiratory Syndrome (MERS-CoV),Severe Acute Respiratory Syndrome (SARS-CoV),apply a multilayer perceptron algorithm on covid19 datasets ,Predict the Spreading of Coronavirus By Using WEKA Tool

INTRODUCTION

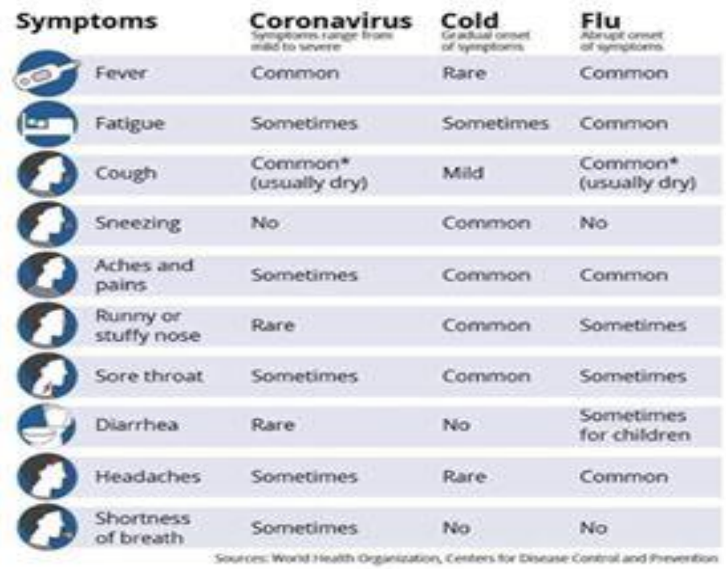
What is CoronaVirus?

Coronaviruses (CoV) are a large family of viruses that cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). Coronavirus disease (COVID-19) is a new strain that was discovered in 2019 and has not been previously identified in humans.

Coronaviruses are zoonotic, meaning they are transmitted between animals and people. Detailed investigations found that SARS-CoV was transmitted from civet cats to humans and MERS-CoV from dromedary camels to humans. Several known coronaviruses are circulating in animals that have not yet infected humans.

What are the symptoms of coronavirus COVID-19

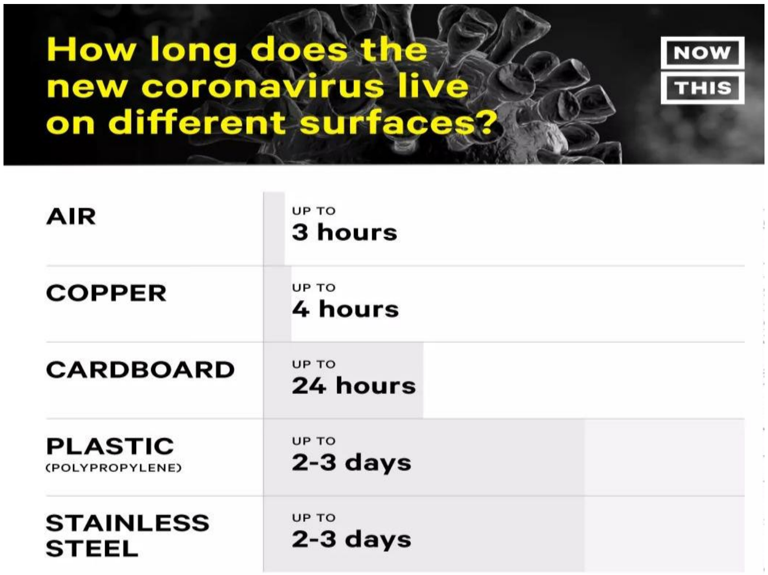
Common signs of infection include respiratory symptoms, fever, cough, shortness of breath and breathing difficulties.



Symptoms	Coronavirus Symptoms range from mild to severe	Cold Gradual onset of symptoms	Flu Abrupt onset of symptoms
Fever	Common	Rare	Common
Fatigue	Sometimes	Sometimes	Common
Cough	Common* (usually dry)	Mild	Common* (usually dry)
Sneezing	No	Common	No
Aches and pains	Sometimes	Common	Common
Runny or stuffy nose	Rare	Common	Sometimes
Sore throat	Sometimes	Common	Sometimes
Diarrhea	Rare	No	Sometimes for children
Headaches	Sometimes	Rare	Common
Shortness of breath	Sometimes	No	No

Sources: World Health Organization, Centers for Disease Control and Prevention

Fig. 1.1:A Comparison table between corona, flu and cold respect to Symptoms[7].



How long does the new coronavirus live on different surfaces?

AIR	UP TO 3 hours
COPPER	UP TO 4 hours
CARDBOARD	UP TO 24 hours
PLASTIC (POLYPROPYLENE)	UP TO 2-3 days
STAINLESS STEEL	UP TO 2-3 days

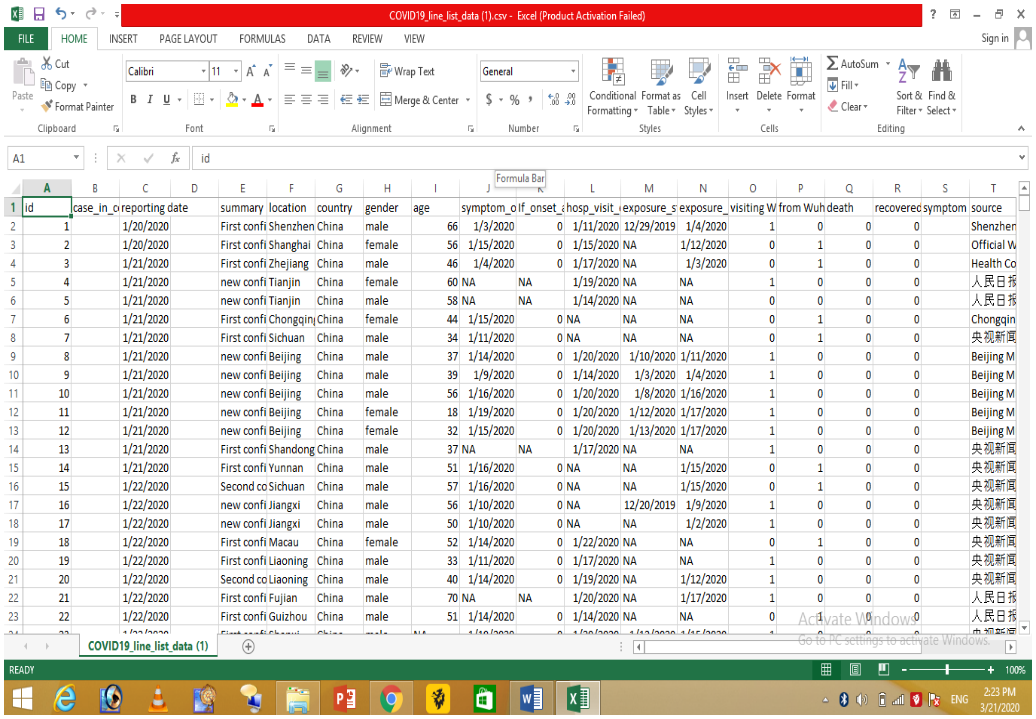
Fig 1.2 Surface Stability of CoronaVirus HCOV-19[8]

SIGNIFICANCE OF THE STUDY

I have used datasets obtained by WHO[1]. And on this We are using the machine learning[4] / data mining tool WEKA[2] Through this, We are trying to understand how the corona virus is affecting the people of which age, how much the infected people are likely to protect. Whether our results are matching with the news that is going on.

ABOUT THE DATASETS[3]

I took this data from the website www.kaggle.com.[3]

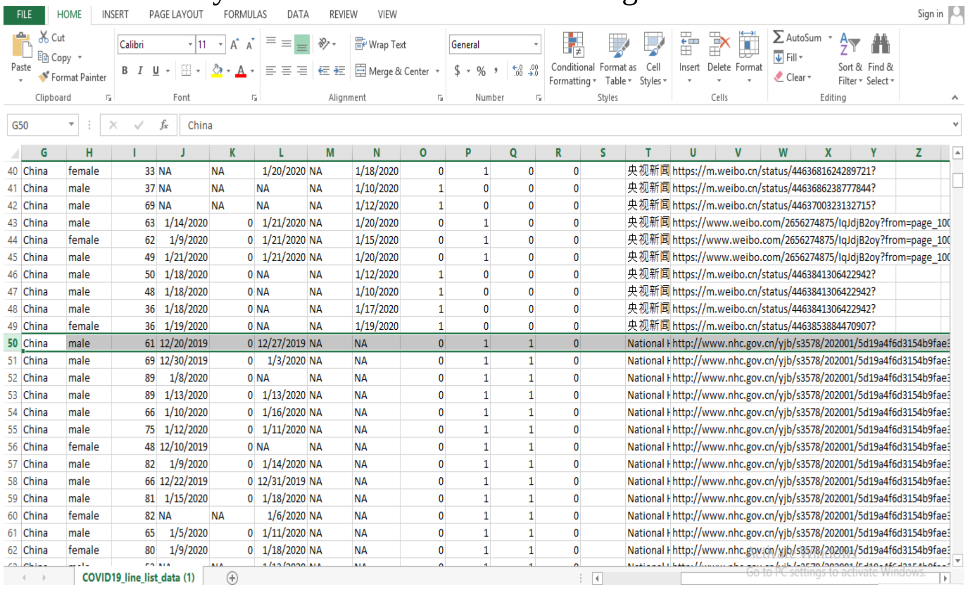


	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	id	case_in_c	reporting date		summary	location	country	gender	age	symptom_o	If_onset_a	hosp_visit_	exposure_s	exposure_	visiting W	from Wuh	death	recovered	symptom	source
2	1		1/20/2020		First confi	Shenzhen	China	male	66	1/3/2020	0	1/11/2020	12/29/2019	1/4/2020	1	0	0	0		Shenzhen
3	2		1/20/2020		First confi	Shanghai	China	female	56	1/15/2020	0	1/15/2020	NA	1/12/2020	0	1	0	0		Official W
4	3		1/21/2020		First confi	Zhejiang	China	male	46	1/4/2020	0	1/17/2020	NA	1/3/2020	0	1	0	0		Health Co
5	4		1/21/2020		new confi	Tianjin	China	female	60	NA	NA	1/19/2020	NA	NA	1	0	0	0		人民日报
6	5		1/21/2020		new confi	Tianjin	China	male	58	NA	NA	1/14/2020	NA	NA	0	0	0	0		人民日报
7	6		1/21/2020		First confi	Chongqin	China	female	44	1/15/2020	0	NA	NA	NA	0	1	0	0		Chongqin
8	7		1/21/2020		First confi	Sichuan	China	male	34	1/11/2020	0	NA	NA	NA	0	1	0	0		央视新闻
9	8		1/21/2020		new confi	Beijing	China	male	37	1/14/2020	0	1/20/2020	1/10/2020	1/11/2020	1	0	0	0		Beijing M
10	9		1/21/2020		new confi	Beijing	China	male	39	1/9/2020	0	1/14/2020	1/3/2020	1/4/2020	1	0	0	0		Beijing M
11	10		1/21/2020		new confi	Beijing	China	male	56	1/16/2020	0	1/20/2020	1/8/2020	1/16/2020	1	0	0	0		Beijing M
12	11		1/21/2020		new confi	Beijing	China	female	18	1/19/2020	0	1/20/2020	1/12/2020	1/17/2020	1	0	0	0		Beijing M
13	12		1/21/2020		new confi	Beijing	China	female	32	1/15/2020	0	1/20/2020	1/13/2020	1/17/2020	1	0	0	0		Beijing M
14	13		1/21/2020		First confi	Shandong	China	male	37	NA	NA	1/17/2020	NA	NA	1	0	0	0		央视新闻
15	14		1/21/2020		First confi	Yunnan	China	male	51	1/16/2020	0	NA	NA	1/15/2020	0	1	0	0		央视新闻
16	15		1/22/2020		Second co	Sichuan	China	male	57	1/16/2020	0	NA	NA	1/15/2020	0	1	0	0		央视新闻
17	16		1/22/2020		new confi	Jiangxi	China	male	56	1/10/2020	0	NA	12/20/2019	1/9/2020	1	0	0	0		央视新闻
18	17		1/22/2020		new confi	Jiangxi	China	male	50	1/10/2020	0	NA	NA	1/2/2020	1	0	0	0		央视新闻
19	18		1/22/2020		First confi	Macau	China	female	52	1/14/2020	0	1/22/2020	NA	NA	0	1	0	0		央视新闻
20	19		1/22/2020		First confi	Liaoning	China	male	33	1/11/2020	0	1/17/2020	NA	NA	1	0	0	0		央视新闻
21	20		1/22/2020		Second co	Liaoning	China	male	40	1/14/2020	0	1/19/2020	NA	1/12/2020	1	0	0	0		央视新闻
22	21		1/22/2020		First confi	Fujian	China	male	70	NA	NA	1/20/2020	NA	1/17/2020	1	0	0	0		人民日报
23	22		1/22/2020		First confi	Guizhou	China	male	51	1/14/2020	0	1/14/2020	NA	NA	0	1	0	0		人民日报

Fig 2.1

Columns-Id,case_in_country,summary,location,country,gender,age .If_onset_approximated ,hosp_visit_date ,exposure_start ,exposure_end,visiting Wuhan from Wuhan ,death ,recovered ,symptomsetc.

According to the datasets [3], the first case of corona virus infected was found in Wuhan, China on 22 December 2019who died shortly after. He was 61. See below fig.



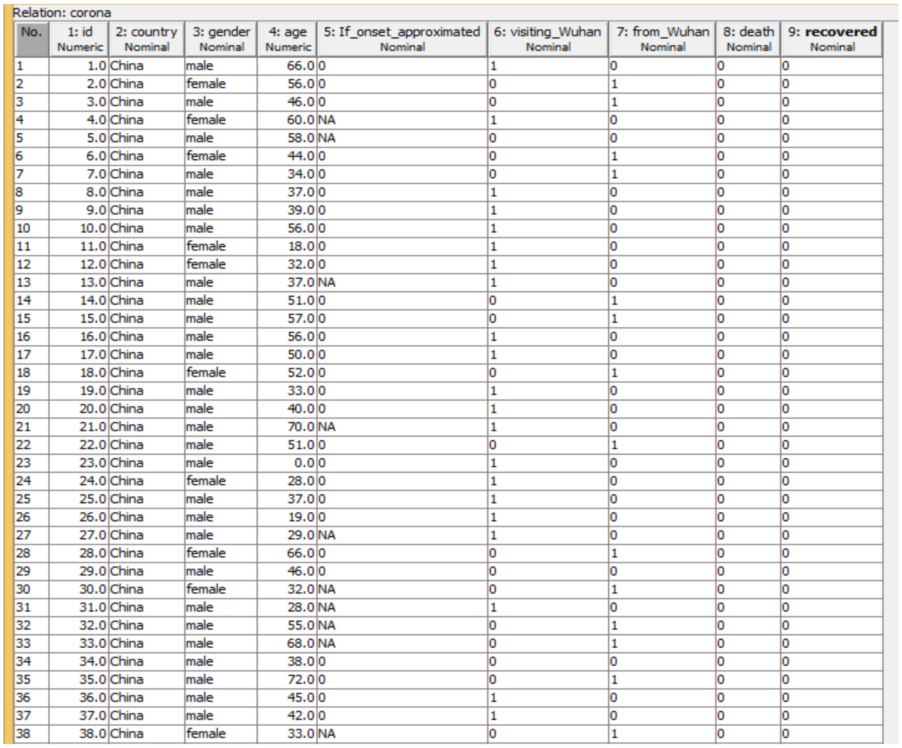
	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
40	China	female	33	NA	NA	1/20/2020	NA	1/18/2020	0	1	0	0		央视新闻	https://m.weibo.cn/status/4463681624289721?					
41	China	male	37	NA	NA	NA	NA	1/10/2020	1	0	0	0		央视新闻	https://m.weibo.cn/status/4463686238777844?					
42	China	male	69	NA	NA	NA	NA	1/12/2020	1	0	0	0		央视新闻	https://m.weibo.cn/status/4463700323132715?					
43	China	male	63	1/14/2020	0	1/21/2020	NA	1/20/2020	0	1	0	0		央视新闻	https://www.weibo.com/2656274875/IqJdjB2oy?from=page_100					
44	China	female	62	1/9/2020	0	1/21/2020	NA	1/15/2020	0	1	0	0		央视新闻	https://www.weibo.com/2656274875/IqJdjB2oy?from=page_100					
45	China	male	49	1/21/2020	0	1/21/2020	NA	1/20/2020	0	1	0	0		央视新闻	https://www.weibo.com/2656274875/IqJdjB2oy?from=page_100					
46	China	male	50	1/18/2020	0	NA	NA	1/12/2020	1	0	0	0		央视新闻	https://m.weibo.cn/status/4463841306422942?					
47	China	male	48	1/18/2020	0	NA	NA	1/10/2020	1	0	0	0		央视新闻	https://m.weibo.cn/status/4463841306422942?					
48	China	male	36	1/18/2020	0	NA	NA	1/17/2020	1	0	0	0		央视新闻	https://m.weibo.cn/status/4463841306422942?					
49	China	female	36	1/19/2020	0	NA	NA	1/19/2020	1	0	0	0		央视新闻	https://m.weibo.cn/status/4463853884470907?					
50	China	male	61	12/20/2019	0	12/27/2019	NA	NA	0	1	1	0		National H	http://www.nhc.gov.cn/yjb/s3578/202001/5d19a4f6d3154b9fae3					
51	China	male	69	12/30/2019	0	1/3/2020	NA	NA	0	1	1	0		National H	http://www.nhc.gov.cn/yjb/s3578/202001/5d19a4f6d3154b9fae3					
52	China	male	89	1/8/2020	0	NA	NA	NA	0	1	1	0		National H	http://www.nhc.gov.cn/yjb/s3578/202001/5d19a4f6d3154b9fae3					
53	China	male	89	1/13/2020	0	1/13/2020	NA	NA	0	1	1	0		National H	http://www.nhc.gov.cn/yjb/s3578/202001/5d19a4f6d3154b9fae3					
54	China	male	66	1/10/2020	0	1/16/2020	NA	NA	0	1	1	0		National H	http://www.nhc.gov.cn/yjb/s3578/202001/5d19a4f6d3154b9fae3					
55	China	male	75	1/12/2020	0	1/11/2020	NA	NA	0	1	1	0		National H	http://www.nhc.gov.cn/yjb/s3578/202001/5d19a4f6d3154b9fae3					
56	China	female	48	12/10/2019	0	NA	NA	NA	0	1	1	0		National H	http://www.nhc.gov.cn/yjb/s3578/202001/5d19a4f6d3154b9fae3					
57	China	male	82	1/9/2020	0	1/14/2020	NA	NA	0	1	1	0		National H	http://www.nhc.gov.cn/yjb/s3578/202001/5d19a4f6d3154b9fae3					
58	China	male	66	12/22/2019	0	12/31/2019	NA	NA	0	1	1	0		National H	http://www.nhc.gov.cn/yjb/s3578/202001/5d19a4f6d3154b9fae3					
59	China	male	81	1/15/2020	0	1/18/2020	NA	NA	0	1	1	0		National H	http://www.nhc.gov.cn/yjb/s3578/202001/5d19a4f6d3154b9fae3					
60	China	female	82	NA	NA	1/6/2020	NA	NA	0	1	1	0		National H	http://www.nhc.gov.cn/yjb/s3578/202001/5d19a4f6d3154b9fae3					
61	China	male	65	1/5/2020	0	1/11/2020	NA	NA	0	1	1	0		National H	http://www.nhc.gov.cn/yjb/s3578/202001/5d19a4f6d3154b9fae3					
62	China	female	80	1/9/2020	0	1/18/2020	NA	NA	0	1	1	0		National H	http://www.nhc.gov.cn/yjb/s3578/202001/5d19a4f6d3154b9fae3					

Fig 2.2 The first case of corona virus infected.

Afterthat, the corona virus spread rapidly in China and also took other countries - abroad.Preprocessing is done in which unwanted columns have been removed before using this dataset.

AFTER PREPROCESSING

Preprocessing is done in which unwanted columns have been removed before using this dataset.Here we are using 9 attributes which you can see in the picture,here the id attribute will be numeric while all the other attributes will be nominal. Here the main focus is on death and recovery attribute.



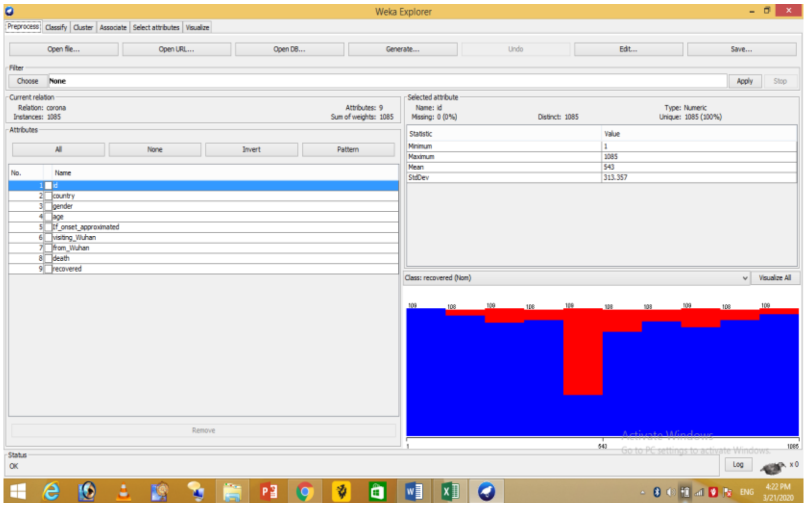
Relation: corona

No.	1: id Numeric	2: country Nominal	3: gender Nominal	4: age Numeric	5: If_onset_approximated Nominal	6: visiting_Wuhan Nominal	7: from_Wuhan Nominal	8: death Nominal	9: **recovered** Nominal
1	1.0	China	male	66.0	0	1	0	0	0
2	2.0	China	female	56.0	0	0	1	0	0
3	3.0	China	male	46.0	0	0	1	0	0
4	4.0	China	female	60.0	NA	1	0	0	0
5	5.0	China	male	58.0	NA	0	0	0	0
6	6.0	China	female	44.0	0	0	1	0	0
7	7.0	China	male	34.0	0	0	1	0	0
8	8.0	China	male	37.0	0	1	0	0	0
9	9.0	China	male	39.0	0	1	0	0	0
10	10.0	China	male	56.0	0	1	0	0	0
11	11.0	China	female	18.0	0	1	0	0	0
12	12.0	China	female	32.0	0	1	0	0	0
13	13.0	China	male	37.0	NA	1	0	0	0
14	14.0	China	male	51.0	0	0	1	0	0
15	15.0	China	male	57.0	0	0	1	0	0
16	16.0	China	male	56.0	0	1	0	0	0
17	17.0	China	male	50.0	0	1	0	0	0
18	18.0	China	female	52.0	0	0	1	0	0
19	19.0	China	male	33.0	0	1	0	0	0
20	20.0	China	male	40.0	0	1	0	0	0
21	21.0	China	male	70.0	NA	1	0	0	0
22	22.0	China	male	51.0	0	0	1	0	0
23	23.0	China	male	0.0	0	1	0	0	0
24	24.0	China	female	28.0	0	1	0	0	0
25	25.0	China	male	37.0	0	1	0	0	0
26	26.0	China	male	19.0	0	1	0	0	0
27	27.0	China	male	29.0	NA	1	0	0	0
28	28.0	China	female	66.0	0	0	1	0	0
29	29.0	China	male	46.0	0	0	0	0	0
30	30.0	China	female	32.0	NA	0	1	0	0
31	31.0	China	male	28.0	NA	1	0	0	0
32	32.0	China	male	55.0	NA	0	1	0	0
33	33.0	China	male	68.0	NA	0	1	0	0
34	34.0	China	male	38.0	0	0	0	0	0
35	35.0	China	male	72.0	0	0	1	0	0
36	36.0	China	male	45.0	0	1	0	0	0
37	37.0	China	male	42.0	0	1	0	0	0
38	38.0	China	female	33.0	NA	0	1	0	0

Fig 2.3 Screenshot after preprocessing

APPLY THE ALGORITHMS ON THE DATASET[3]

After preprocessing, the algorithm will apply to the data. We know that every algorithm has its own characteristics. This paper has used multilayer perceptron algorithm[4] [5] [6] and also put percentage split = 66% for data training and set the **recovered** attribute as a class. Hence 66% of the data will be used for trainingand the remaining data will be used for testing.



Filter: None

Current relation
Relation: corona
Instances: 1085
Attributes: 9
Sum of weights: 1085

Attributes

No.	Name
1	id
2	country
3	gender
4	age
5	If_onset_approximated
6	visiting_Wuhan
7	from_Wuhan
8	death
9	recovered

Selected attribute
Name: id
Missing: 0 (0%)
Distinct: 1085
Type: Numeric
Unique: 1085 (100%)

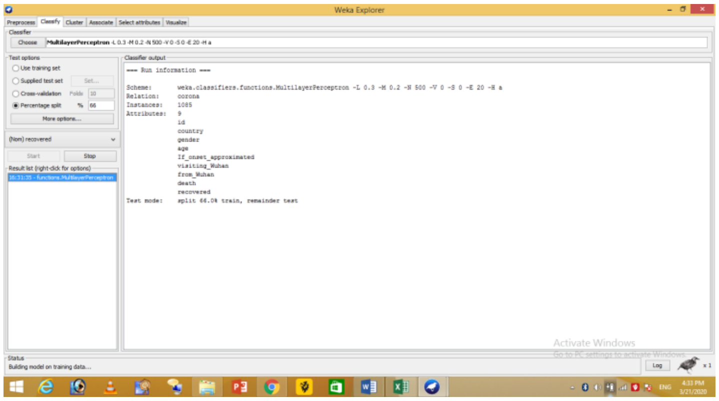
Statistic	Value
Minimum	1
Maximum	1085
Mean	543
StdDev	313.357

Class: recovered (Nom)

Status
OK

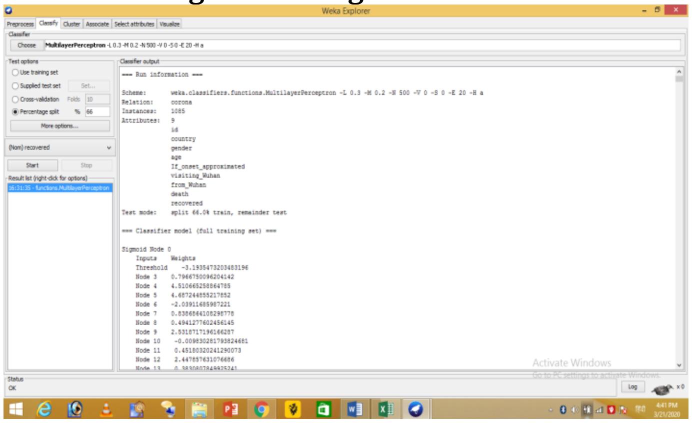
Fig 2.4 Dataset is ready for MLP algorithm

Run the Multilayer Perceptron (MLP) algorithm against the data. MLP uses backpropagation[6] to classify instances.The sigmoid nodes are the nodes used in backpropogation[6] and the associated data. This is the network itself (its weights and attributes). The nodes in the hidden layer of this network are all sigmoid but the output nodes are linear units (eg. linear node 0 is your output unit and sigmoid nodes 1-6 are your six hidden units). All the values given are your interconnection weights. You can use them to manually calculate your results (which is done for you below the network).The bottom part is the final results calculated from the network.



```
=== Run information ===

Scheme:       weka.classifiers.functions.MultilayerPerceptron -L 0.3 -M 0.2 -N 500 -V 0 -S 0 -E 20 -H a
Relation:     corona
Instances:    1085
Attributes:   9
              id
              country
              gender
              age
              If_onset_approximated
              visiting_Wuhan
              from_Wuhan
              death
              recovered
Test mode:    split 66.0% train, remainder test
```

Fig. 2.5: At Sigmoid node 0

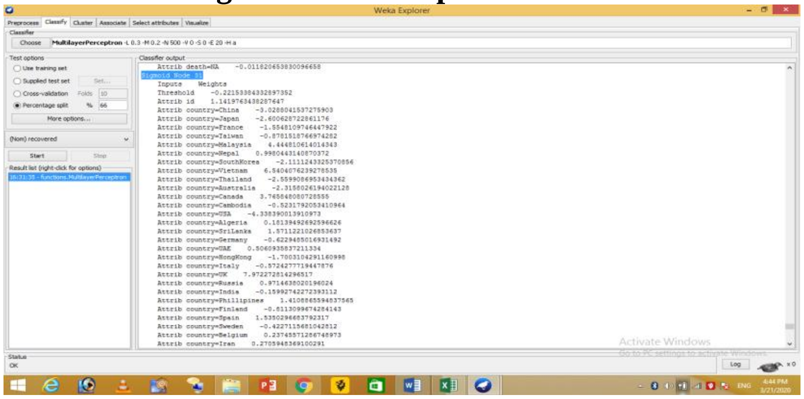


```
=== Run information ===

Scheme:       weka.classifiers.functions.MultilayerPerceptron -L 0.3 -M 0.2 -N 500 -V 0 -S 0 -E 20 -H a
Relation:     corona
Instances:    1085
Attributes:   9
              id
              country
              gender
              age
              If_onset_approximated
              visiting_Wuhan
              from_Wuhan
              death
              recovered
Test mode:    split 66.0% train, remainder test

=== Classifier model (full training set) ===

Sigmoid Node 0
    Inputs    Weights
    Threshold    -3.193547320348319б
    Node 3    0.7966750096204142
    Node 4    4.510665258864785
    Node 5    4.687244855217852
    Node 6    -2.03911685987221
    Node 7    0.8386864108298778
    Node 8    0.4941277602456145
    Node 9    2.5318717196166287
    Node 10    -0.009830281793824681
    Node 11    0.45180320241290073
    Node 12    2.447857631076686
    Node 13    0.3830807849925241
```

Fig.2.6 :At sigmoid mode 31

And end with sigmoid node 31. Hence 32 sigmoid nodes are used.

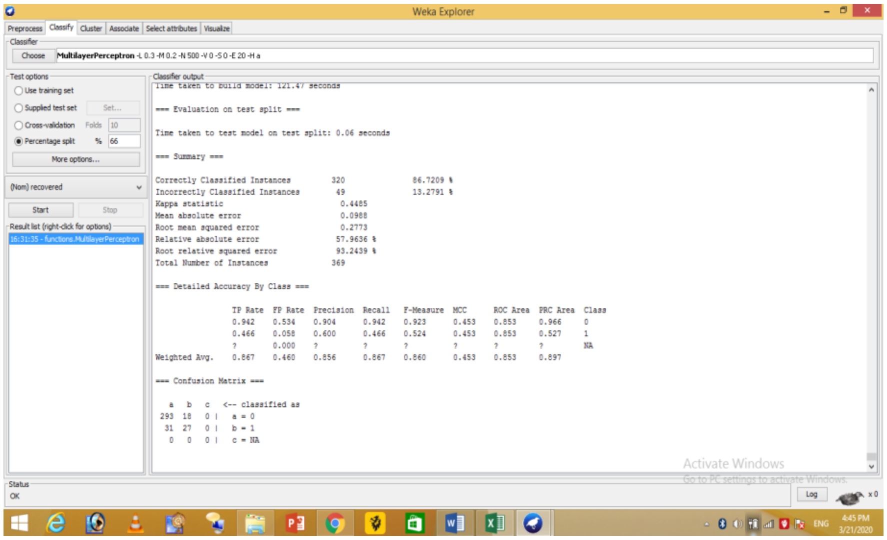
Fig. 2.7:After complete the run



```
    Attrib death=NA    -0.011820653830096658
Sigmoid Node 31
    Inputs    Weights
    Threshold    -0.22153384332897352
    Attrib id    1.1419763438287647
    Attrib country=China    -3.0288041537275903
    Attrib country=Japan    -2.600628722861176
    Attrib country=France    -1.5548109746447922
    Attrib country=Taiwan    -0.8781518766974282
    Attrib country=Malaysia    4.444810614014343
    Attrib country=Nepal    0.9980443140870372
    Attrib country=SouthKorea    -2.1111243325370856
    Attrib country=Vietnam    6.5404076239278535
    Attrib country=Thailand    -2.5599086953434362
    Attrib country=Australia    -2.3158026194022128
    Attrib country=Canada    3.765548080728555
    Attrib country=Cambodia    -0.5231792053410964
    Attrib country=USA    -4.338390013910973
    Attrib country=Algeria    0.18139492692596626
    Attrib country=SriLanka    1.5711221026853637
    Attrib country=Germany    -0.6229485016931492
    Attrib country=UAE    0.5060935837211334
    Attrib country=HongKong    -1.7003104291160998
    Attrib country=Italy    -0.5724277719447876
    Attrib country=UK    7.972272814296517
    Attrib country=Russia    0.9714638020196024
    Attrib country=India    -0.15992742272393112
    Attrib country=Phillipines    1.4108865594837565
    Attrib country=Finland    -0.6113099674284143
    Attrib country=Spain    1.5350296683792317
    Attrib country=Sweden    -0.4227115681042812
    Attrib country=Belgium    0.23745571286748973
    Attrib country=Iran    0.2705948369100291
```

EXPLANATION OF THE RESULT

Since we had initially put percentage split = 66% for data training. Hence 66% of the data will be used for trainingand the remaining data will be used for testing.Therefore, after the process of perceptron algorithm, the result obtained in the confusion matrix is the result of testing the remaining data.A confusion matrix$_{[4]}$is a summary of prediction results on a classification problem. The number of correct and incorrect predictions are summarized with count values and broken down by each class. This is the key to the confusion matrix. The confusion matrix shows the ways in which your classification model is confused when it makes predictions.



Classifier: MultilayerPerceptron -L 0.3 -M 0.2 -N 500 -V 0 -S 0 -E 20 -H a

● Percentage split % 66

(Nom) recovered

Classifier output

```
Time taken to build model: 121.47 seconds

=== Evaluation on test split ===

Time taken to test model on test split: 0.06 seconds

=== Summary ===

Correctly Classified Instances         320               86.7209 %
Incorrectly Classified Instances        49               13.2791 %
Kappa statistic                          0.4485
Mean absolute error                      0.0988
Root mean squared error                  0.2773
Relative absolute error                 57.9636 %
Root relative squared error             93.2439 %
Total Number of Instances              369

=== Detailed Accuracy By Class ===

                 TP Rate  FP Rate  Precision  Recall   F-Measure  MCC      ROC Area  PRC Area  Class
                 0.942    0.534    0.904      0.942    0.923      0.453    0.853     0.966     0
                 0.466    0.058    0.600      0.466    0.524      0.453    0.853     0.527     1
                 ?        0.000    ?          ?        ?          ?        ?         ?         NA
Weighted Avg.    0.867    0.460    0.856      0.867    0.860      0.453    0.853     0.897

=== Confusion Matrix ===

   a   b   c   <-- classified as
 293  18   0 |   a = 0
  31  27   0 |   b = 1
   0   0   0 |   c = NA
```

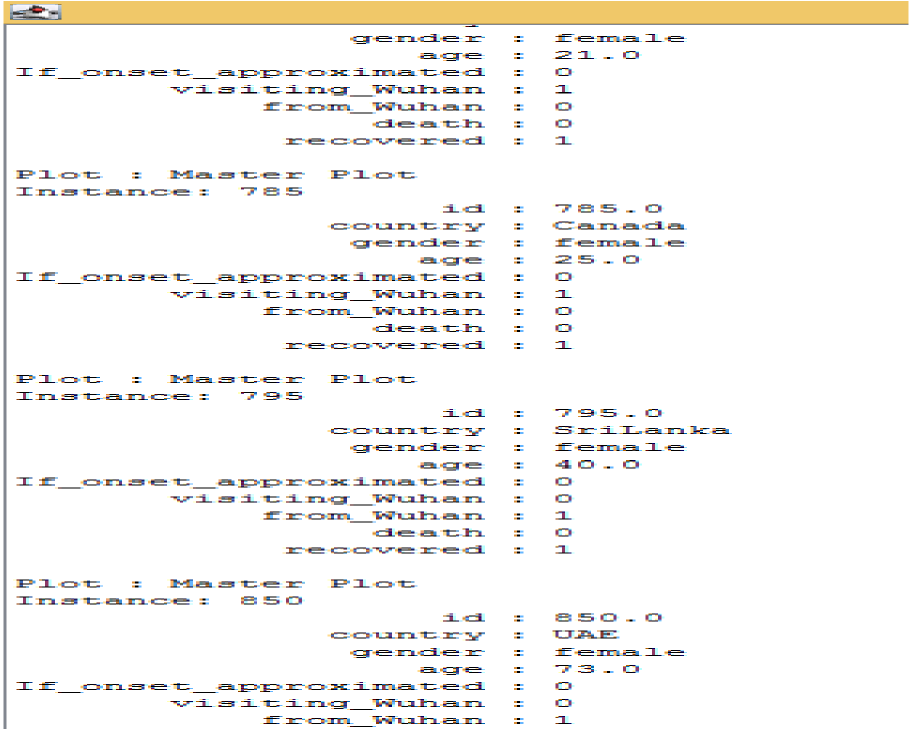
Activate Windows
Go to PC settings to activate Windows.

4:45 PM
3/21/2020

Fig. 3.1: Summary and confusion matrix

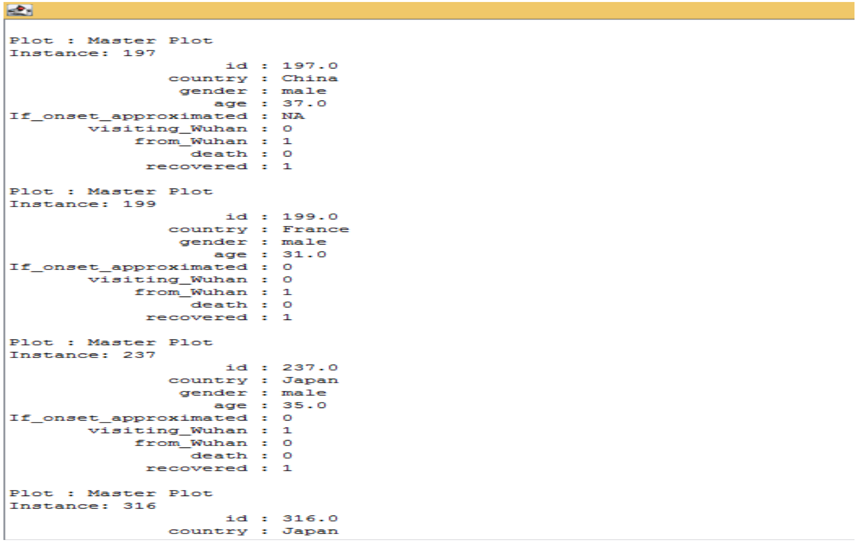
The data of 369 instance, ie 369 infected people has been tested. And as a result this matrix is formed. Let us try to understand this matrix. Out of 369 people, 293 people have not been recovered yet, all of them are undergoing treatment. Out of them, there is every hope of the rescue of 18 people. While 58 people have recovered, out of which 31 people seemed less likely to survive.

Those who have recovered successfully, the age is the most important. According to science and physicians, as a person's age increases, so does his / her immunity system week, only few people are able to maintain the immunity system even in their old age, or say that even after infection their immunity system quickly becomes strong.



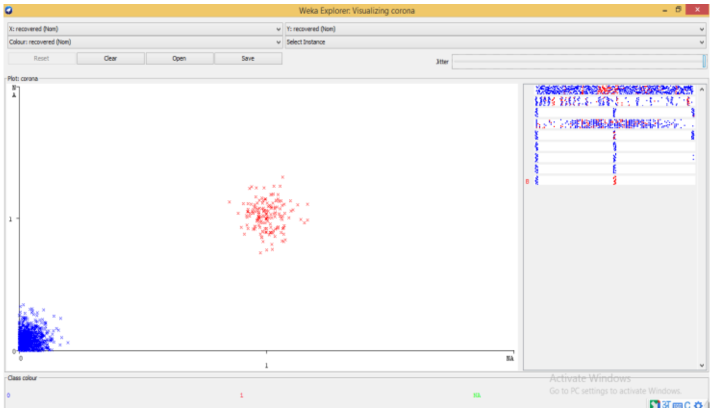
```
                gender  :  female
                   age  :  21.0
If_onset_approximated  :  0
      visiting_Wuhan  :  1
          from_Wuhan  :  0
               death  :  0
           recovered  :  1

Plot  :  Master  Plot
Instance:  785
                    id  :  785.0
               country  :  Canada
                gender  :  female
                   age  :  25.0
If_onset_approximated  :  0
      visiting_Wuhan  :  1
          from_Wuhan  :  0
               death  :  0
           recovered  :  1

Plot  :  Master  Plot
Instance:  795
                    id  :  795.0
               country  :  SriLanka
                gender  :  female
                   age  :  40.0
If_onset_approximated  :  0
      visiting_Wuhan  :  0
          from_Wuhan  :  1
               death  :  0
           recovered  :  1

Plot  :  Master  Plot
Instance:  850
                    id  :  850.0
               country  :  UAE
                gender  :  female
                   age  :  73.0
If_onset_approximated  :  0
      visiting_Wuhan  :  0
          from_Wuhan  :  1
```

Fig. 3.2 Women's recoverability



```
Plot : Master Plot
Instance: 197
                      id : 197.0
                 country : China
                  gender : male
                     age : 37.0
If_onset_approximated : NA
         visiting_Wuhan : 0
             from_Wuhan : 1
                  death : 0
              recovered : 1

Plot : Master Plot
Instance: 199
                      id : 199.0
                 country : France
                  gender : male
                     age : 31.0
If_onset_approximated : 0
         visiting_Wuhan : 0
             from_Wuhan : 1
                  death : 0
              recovered : 1

Plot : Master Plot
Instance: 237
                      id : 237.0
                 country : Japan
                  gender : male
                     age : 35.0
If_onset_approximated : 0
         visiting_Wuhan : 1
             from_Wuhan : 0
                  death : 0
              recovered : 1

Plot : Master Plot
Instance: 316
                      id : 316.0
                 country : Japan
```

Fig. 3.3: Men's recoverability



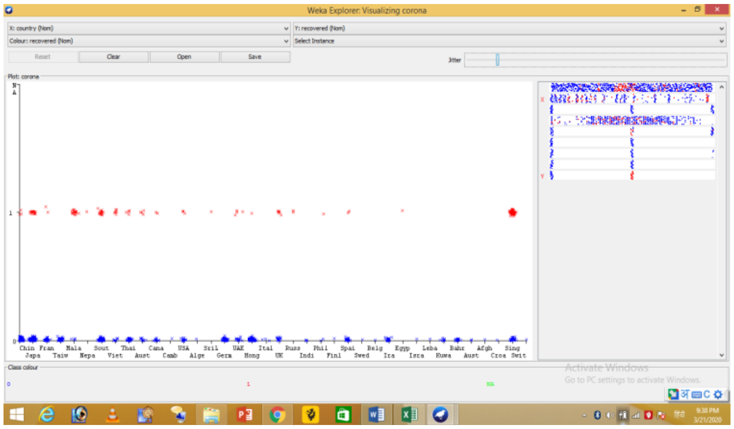
X: recovered (Nom) Y: recovered (Nom)
Colour: recovered (Nom) Select Instance

Fig. **3.4:Total recoverability**

0 = no recover, is present by blue dots. And 1= recover, is present by red dots.

POSSIBILITY OF RECOVERY IS DEPENDING ON COUNTRY?

There is also a question that the possibility of recovery of an infected person is also based on the country and abroad.If we talk about Singapore then you can seehere. From the data tested, 23 infected persons of Singapore were found, out of which 6 people have been cured and the remaining 17 are undergoing treatment (not recovered).



X: country (Nom) Y: recovered (Nom)
Colour: recovered (Nom) Select Instance

Weka Explorer: Visualizing corona
Reset
Clear
Open
Save
Jitter
Plot: corona
N
A
1
Chin Fran Mala Sout Thai Cana USA Sril UAE Ital Russ Phil Spai Belg Egyp Leba Bahr Afgh Sing
Japa Taiw Nepa Viet Aust Camb Alge Germ Hong UK Indi Finl Swed Ira Isra Kuwa Aust Croa Swit
Class colour
0
1
NA
Activate Windows
Go to PC settings to activate Windows.

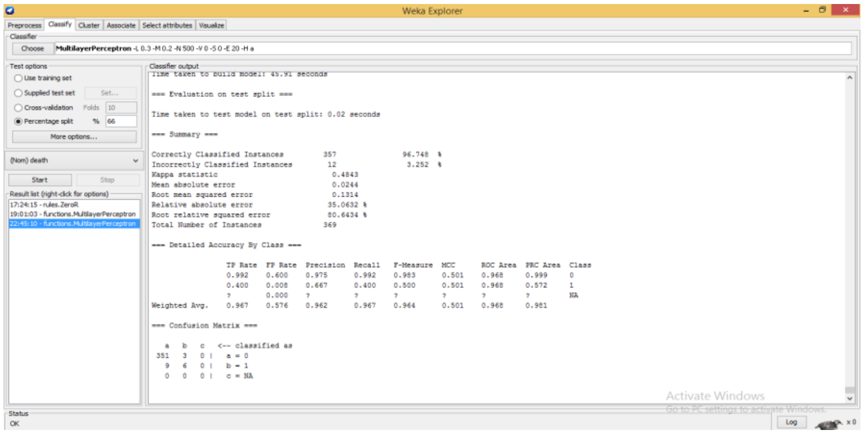
Fig 3.1.1: Visualization of recoverability

Where darker colors (red and blue dots), there are more cases of infected cases, and accordingly the rates of Recover and No Recover are seen to be increasing. It is clear that the names of the foreign countries do not matter, how the patients are being treated there, and what are the preventive methods to prevent the virus from spreading. For example, WHO[1] has released a list of several methods of rescue so that it is necessary to be adopted by the individual, the country, that is, all of them. Since no vaccine has yet been made, only rescue is the only solution. The visualization of the data tested above is clear that if the infected cases increase then there may be a problem in recovery and the rate of getting infected by it will keep increasing more rapidly. And that's why it has been declared a global epidemic.

How likely is death from corona virus?

Now, discuss about **that how likely is death from corona virus?**

Here obtained a new confusion matrix by applying the same procedure by applying multilayer perceptron algorithm and classifying the death attribute.Since we had initially put percentage split = 66% for data training. Hence 66% of the data will be used for trainingand the remaining data will be used for testing.Therefore, after the process of perceptron algorithm, the result obtained in the confusion matrix is the result of testing the remaining data.The data of 369 instance, ie 369 infected people has been tested. And as a result this matrix is formed. Let us try to understand this matrix. Out of 369 people, 15 have died, while 9of them had little chance of survival. In addition, there is a possibility that 3 other people may die. While some of these 351 people have recovered and some are undergoing treatment.



Classifier: MultilayerPerceptron -L 0.3 -M 0.2 -N 500 -V 0 -S 0 -E 20 -H a

Test options:
○ Use training set
○ Supplied test set
○ Cross-validation Folds 10
● Percentage split % 66

(Nom) death

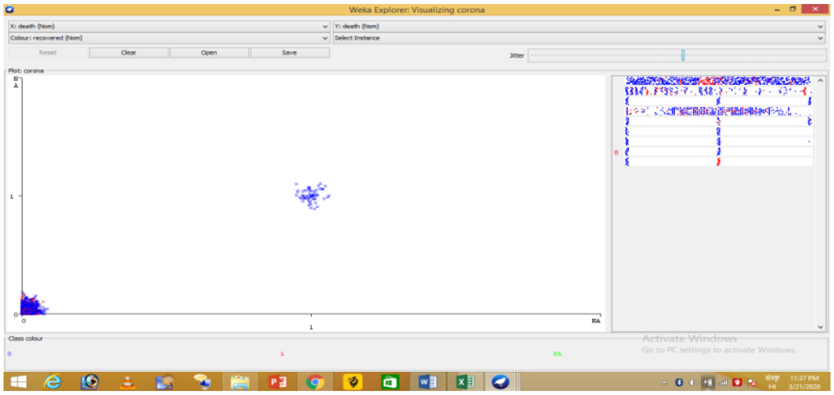
Result list (right-click for options):
17:24:15 - rules.ZeroR
19:01:03 - functions.MultilayerPerceptron
22:45:10 - functions.MultilayerPerceptron

Classifier output:

```
Time taken to build model: 45.91 seconds

=== Evaluation on test split ===

Time taken to test model on test split: 0.02 seconds

=== Summary ===

Correctly Classified Instances         357               96.748  %
Incorrectly Classified Instances        12                3.252  %
Kappa statistic                          0.4843
Mean absolute error                      0.0244
Root mean squared error                  0.1314
Relative absolute error                 35.0632 %
Root relative squared error             80.6434 %
Total Number of Instances              369

=== Detailed Accuracy By Class ===

                 TP Rate  FP Rate  Precision  Recall   F-Measure  MCC      ROC Area  PRC Area  Class
                 0.992    0.600    0.975      0.992    0.983      0.501    0.968     0.999     0
                 0.400    0.008    0.667      0.400    0.500      0.501    0.968     0.572     1
                 ?        0.000    ?          ?        ?          ?        ?         ?         NA
Weighted Avg.    0.967    0.576    0.962      0.967    0.964      0.501    0.968     0.981

=== Confusion Matrix ===

   a   b   c   <-- classified as
 351   3   0 |   a = 0
   9   6   0 |   b = 1
   0   0   0 |   c = NA
```

Status: OK

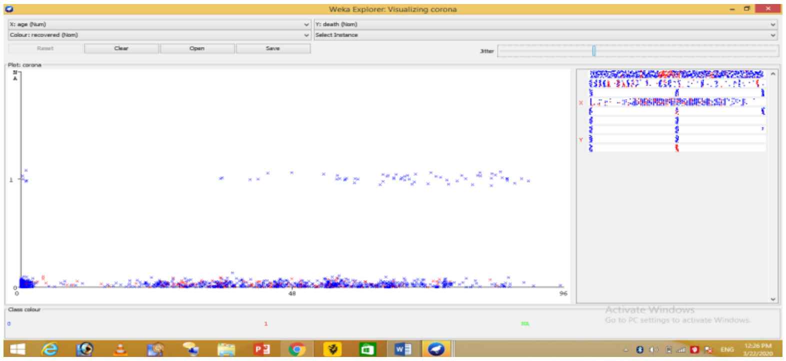
Fig. 3.2.1: Summary and confusion matrix



X: death (Nom)
Y: death (Nom)
Colour: recovered (Nom)
Select Instance

Fig. 3.2.2: Visualization after apply the MLP Algorithm.

At 0, some peoples are recovered and some peoples are undergoing treatment, while at 1, peoples are died , which is the maximum in the number , but is the minimum rate than recover rate.Like I already saidthat the visualization of the data tested above is clear that if the infected cases increase then there may be a problem in recovery and the rate of getting infected by it will keep increasing more rapidly. If the number of infected persons increases as fast as possible, then the time taken to recover may result in a higher death situation.One reason for this, transition area will also have to increase. However, which infected people are more likely to die? Let's have a look here

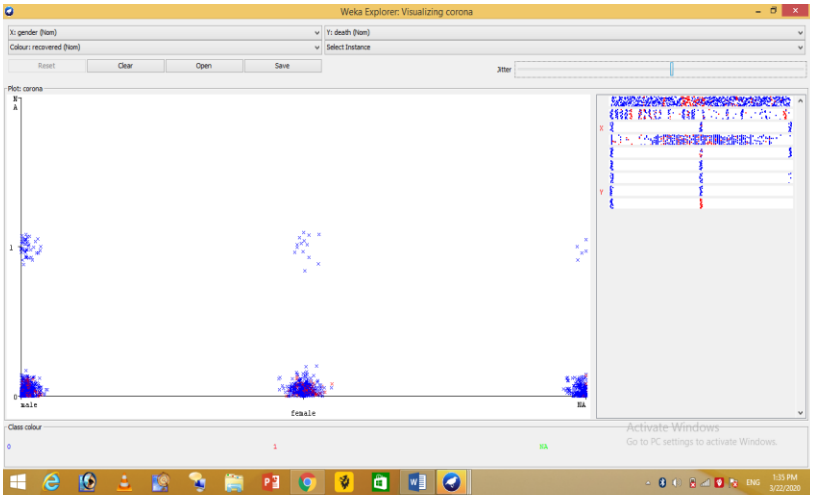

Weka Explorer: Visualizing corona

X: age (Num)
Y: death (Nom)
Colour: recovered (Nom)
Select Instance
Plot: corona

Visualization diagram - death, recovered and currently in treatment people

In the visualization picture, the darkest blue dots are higher at the bottom. These dark blue dots are the number of infected individuals who are currently being treated. Red dots are also visible among them, it is showing the recovered people. While there are light blue dots on the top, they show dead people.This plot is showing the relation between age and death numbers Most of the death numbers are seen above 50 people. But if you look down, you get confirmation of recovery of more than 50 years. This means that the whole game is the strength of the immune system.

But the thing to note is that the effect of coronavirus is less visible in women and children than men.If we look at the figures of the dead, the number of women and children in it is less.


Weka Explorer: Visualizing corona

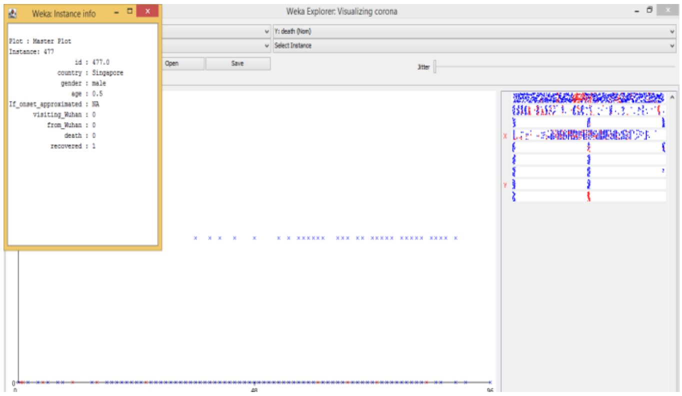
X: gender (Nom)
Y: death (Nom)
Colour: recovered (Nom)
Select Instance
Plot: corona

Fig. 3.2.4: Visualization of recoverability of various gender.

In this diagram you can also see that most of the dots upwards are coming from men, rather than women. A study by the Chinese Centers of Disease Control revealed that of the 44,000 people infected with coronaviruses, 2.8% were killed and 1.7% were women. Talking about age, while 0.2% of the children and adolescents infected with the virus have died, 15% of people over the age of 80 have died.

SHOULD IT BE UNDERSTOOD FROM THESE FIGURES THAT WOMEN AND CHILDREN HAVE LESS FEAR OF BEING CORONAVIRUS

One reason may be that infections in women and children are less or that their body can fight the virus better. Doctor Bharat Pankhania from the University of Exeter says, "Everyone is infected with the new virus that comes in, it's the most important thing. The reason is that no one has the immunity to fight that virus.".[7][8]



```
Plot : Master Plot
Instance: 477
                   id : 477.0
              country : Singapore
               gender : male
                  age : 0.5
If_onset_approximated : NA
        visiting_Wuhan : 0
           from_Wuhan : 0
                death : 0
            recovered : 1
```

Fig.3.3.1: Visualization of Recovery in 5 month old child patient

Doctor Nathalie McDermitt[7] of King's College London explains, "One of the reasons behind decreasing infections in children may be that parents protect children more. Protects them from the risk of infection.

You will be surprised to know that the number of women died in coronavirus is less than men. However, scientists are not surprised by this at all. The same is seen in other infections including flu. The reason for this is that due to their lifestyle, the health of men is worse than that of women. Their lifestyle includes smoking and alcohol more than women. However, the difference in how the immune system of men and women reacts to infection also matters.

Professor Paul Hunter[7] at the University of East Anglia says, "Women have intrinsically different immune responses than men; women are at greater risk of auto-immune diseases (diseases caused by over-activation of the immune system). And there is also considerable evidence that women produce better antibodies to flu vaccines.

Children may develop corona virus infection. The youngest case yet, is of a day-old child. Very little is known about the symptoms of Covid-19 in children, but the symptoms are mild such as fever, runny nose and cough. Even young children can become ill from it. The same happens in the case of flu in which children below five years of age (especially less than two years) are at greater risk.

"People become more ill as they age, because their immunity decreases," says Doctor Pankhania[8]. More infections have been found in older people or in people already suffering from diseases like weak immunity and severe asthma. They will be at greater risk, but the effect of the virus in children has been found to be mild.

Children's immune system is better?

There are important differences in the immune system of a child and adult. In childhood our immune system is immature and can react excessively, so it is normal for children to have fever. Hyper activation of the immune system is also not good because it can damage the rest of the body. This is also one reason for coronavirus to be fatal.

CONCLUSION

As the result, we find out that the effect of Covid-19 is less visible in women and children than in men and the comparison between recoverability of men and women.

We find that the possibility of recovery does not depends on space and genre, it depends only on the patient's immunity systems.

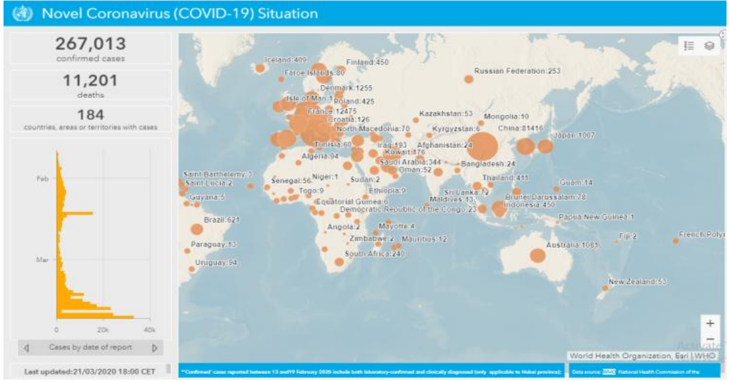
Table-1: Countries, areas or territories with cases[9].

China :81416 cases	Italy :47021 cases	Spain :19980 cases	Iran (Islamic Republic of) :19644 cases	Germany :18323 cases
United States of America :15219 cases	France :12475 cases	Republic of Korea :8799 cases	Switzerland :4840 cases	The United Kingdom :3983 cases
Netherlands :2994 cases	Austria :2649 cases	Belgium :2257 cases	Norway :1742 cases	Sweden :1623 cases
Denmark :1255 cases	Australia :1081 cases	Malaysia :1030 cases	Portugal :1020 cases	Japan :1007 cases
Czechia :904 cases	Canada :846 cases	Israel :712 cases	International conveyance (Diamond Princess) :712 cases	Ireland :683 cases
Turkey :670 cases	Brazil :621 cases	Greece :495 cases	Pakistan :495 cases	Luxembourg :484 cases
Qatar :470 cases	Finland :450 cases	Indonesia :450 cases	Chile :434 cases	Poland :425 cases
Thailand :411 cases	Iceland :409 cases	Singapore :385 cases	Ecuador :367 cases	Saudi Arabia :344 cases
Slovenia :341 cases	Romania :308 cases	Philippines :307 cases	Bahrain :297 cases	Egypt :285 cases
Estonia :283 cases	India :258 cases	Russian Federation :253 cases	South Africa :240 cases	Peru :234 cases
Iraq :193 cases	Lebanon :187 cases	Kuwait :176 cases	Mexico :164 cases	Serbia :159 cases
San Marino :151 cases	Colombia :145 cases	United Arab Emirates :140 cases	Slovakia :137 cases	Panama :137 cases
Armenia :136 cases	Argentina :128 cases	Bulgaria :127 cases	Croatia :126 cases	Costa Rica :113 cases
Latvia :111 cases	Uruguay :94 cases	Algeria :94 cases	Viet Nam :91 cases	Morocco :86 cases
Hungary :85 cases	Jordan :84 cases	Faroe Islands :80 cases	Brunei Darussalam :78 cases	Andorra :75 cases
Sri Lanka :72 cases	Dominican Republic :72 cases	Albania :70 cases	North Macedonia :70 cases	Lithuania :69 cases
Cyprus :67 cases	Republic of	Malta :64 cases	Burkina Faso :64	Tunisia :60casesBelarus :5

	Moldova :66 cases		cases	7 cases
Senegal :56 cases	New Zealand :53 cases	Kazakhstan :53 cases	occupied Palestinian territory :52 cases	Oman :52 cases
Cambodia :51 cases	Guadeloupe :51 cases	Azerbaijan :44 cases	Bosnia and Herzegovina :44 cases	Georgia :43 cases
Venezuela (Bolivarian Republic of) :36 cases	Liechtenstein :34 cases	Uzbekistan :33 cases	Martinique :32 cases	Réunion :28 cases
Cameroon :27 cases	Ukraine :26 cases	Bangladesh :24 cases	Afghanistan :24 cases	Honduras :24 cases
Democratic Republic of the Congo :23 cases	Nigeria :22 cases	Ghana :19 cases	Rwanda :17 cases	Bolivia (Plurinational State of) :16 cases
Cuba :16 cases	Jamaica :16 cases	French Guiana :15 cases	Guam :14 cases	Montenegro :14 cases
Puerto Rico :14 cases	Maldives :13 cases	Paraguay :13 cases	Jersey :12 cases	Monaco :12 cases
Guatemala :12 cases	Mauritius :12 cases	French Polynesia :11 cases	Mongolia :10 cases	Gibraltar :10 cases
Trinidad and Tobago :9 cases	Côte d'Ivoire :9 cases	Ethiopia :9 cases	Togo :9 cases	Kenya :7 cases
Seychelles :7 cases	Kyrgyzstan :6 cases	Equatorial Guinea :6 cases	United Republic of Tanzania :6 cases	Aruba :5 cases
Barbados :5 cases	Guyana :5 cases	Bahamas :4 cases	Saint Martin :4 cases	Mayotte :4 cases
Cayman Islands :3 cases	Curacao :3 cases	Saint Barthelemy :3 cases	United States Virgin Islands :3 cases	Cabo Verde :3 cases
Central African Republic :3 cases	Congo :3 cases	Gabon :3 cases	Liberia :3 cases	Madagascar :3 cases
Namibia :3 cases	Fiji :2 cases	New Caledonia :2 cases	Greenland :2 cases	Bhutan :2 cases
Sudan :2 cases	Bermuda :2 cases	Haiti :2 cases	Saint Lucia :2 cases	Suriname :2 cases
Angola :2 case	Benin :2 cases	Guinea :2 cases	Mauritania :2 cases	Zambia :2 cases
Zimbabwe :2 cases	Papua New Guinea :1 cases	Guernsey :1 cases	Holy See :1 cases	Isle of Man :1 cases
Nepal :1 cases	Timor-Leste :1	Djibouti :1	Somalia :1 cases	Antigua and Barbuda :1

	cases	cases		cases
El Salvador :1 cases	Montserrat :1 cases	Nicaragua :1 cases	Saint Vincent and the Grenadines :1 cases	Sint Maarten :1 cases
Chad :1 cases	Eswatini :1 cases	Gambia :1 cases	Niger :1 cases	

So far, the following infected cases have arrived, including 184 countries and more .


Novel Coronavirus (COVID-19) Situation

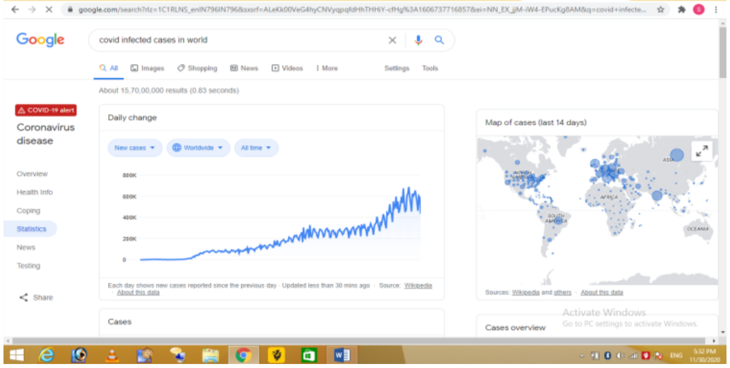
267,013 confirmed cases

11,201 deaths

184 countries, areas or territories with cases

Last updated:21/03/2020 18:00 CET

Fig. 4.2: According to the data received by 21 March 2020[9].


google.com/search?rlz=1C1RLNS_enIN796IN796&sxsrf=ALeKk00VeG4hyCNVyqpqfdHhTHHiY-cfHg%3A1606737716857&ei=NN_EX_jjM-iW4-EPucKg8AM&q=covid+infecte...

covid infected cases in world

About 15,70,00,000 results (0.83 seconds)

COVID-19 alert

Coronavirus disease

Daily change

New cases ▾ Worldwide ▾ All time ▾

Each day shows new cases reported since the previous day · Updated less than 30 mins ago · Source: Wikipedia · About this data

Map of cases (last 14 days)

Sources: Wikipedia and others · About this data

Cases

Cases overview

Fig. 4.3: Coronavirus Disease (Covid-19) infected cases in worldby WHO

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8. Fig.1.2:Surface Stability of CoronaVirus-HCOV-19https://www.bhaskar.com
9. Fig. 4.2 : According to the data received by 21 March 2020 ,
   Fig.4.1: Table-1: Countries, areas or territories with cases https://www.who.int/