DO YOU GET

PANIC NOW?

Burhan Rafid Ekatama

Student of Data Science Bootcamp 19

TABLE OF CONTENTS

Why people in China are panic buying canned yellow

in China has sparked panic buying of fever
emedies such as...

'People Are Terrified': Panic Sweeps Kabul As Taliban Moves
Toward Afghan Capital

Fear and panic is gripping residents of the Afghan capital as Taliban militants march
toward the city following a blistering offensive in which they have...

15 Des 2022

Gem
Panik

Gempa

Dekat Jadi Raja HP Dunia

a menjadi salah satu pasar ekonomi terbesar di dunia
miliar orang

Anxiety aftercare: What real people do next after a panic
attack

Three Metro.co.uk readers have their say on their next steps after having anxiety, and
what helps them manage their symptoms.

1 bulan lalu

Lahan Rumbia di Aceh Besar
an

cana Daerah (BPBD) Aceh Besar, Ridwan Jamil
pelepah rumbia dan daun

People in nort
quakes that kil

Tips jika tiba-tiba bertemu
panik. Halaman all.

11 jam lalu

'Why do something like that?': Deadly shooting near Gorge
leaves people in fear and panic

By clicking "Accept All Cookies", you agree to the storing of cookies on your device to
enhance site navigation, analyze site usage, and assist in our...

12 jam lalu

21 Feb 2023

Kenali Apa Itu Anxiety dan Cara Mengata
Kompas.com

Anxiety disorder adalah gangguan kesehatan mental yang membuat penderitanya
merespons hal dan situasi tertetu dengan ketakutan berlebihan.

nments, reviving eerie memories...

7 Apr 2023

Panic attacks are feelings of intense **fear and anxiety.** Panic attacks often occur when a person is worried about something in their life or has experienced **something very difficult and stressful** (www.unicef.org)

Anxiety is a feeling of **discomfort**, such as **worry or fear,** that can be mild or severe. For example, feeling worried and anxious when facing exams, when going to undergo medical tests or job interviews (www.nhs.uk)

PROBLEM OVERVIEW

The processed data consisted of 120,000 respondents

Goals:
1. Predict the best model for patients who are suspected of having panic disorder or not
2. Answer the question about what the most factor on panic disorder, in what gender, and distribution the positive by age
3. Providing insight to the wider community about panic disorder

PROBLEM OVERVIEW

Positive vs Negative Panic Disorder

Out of 120,000 respondents, there were 5126 respondents **(4.27%)** who **positively** Panic Disorder
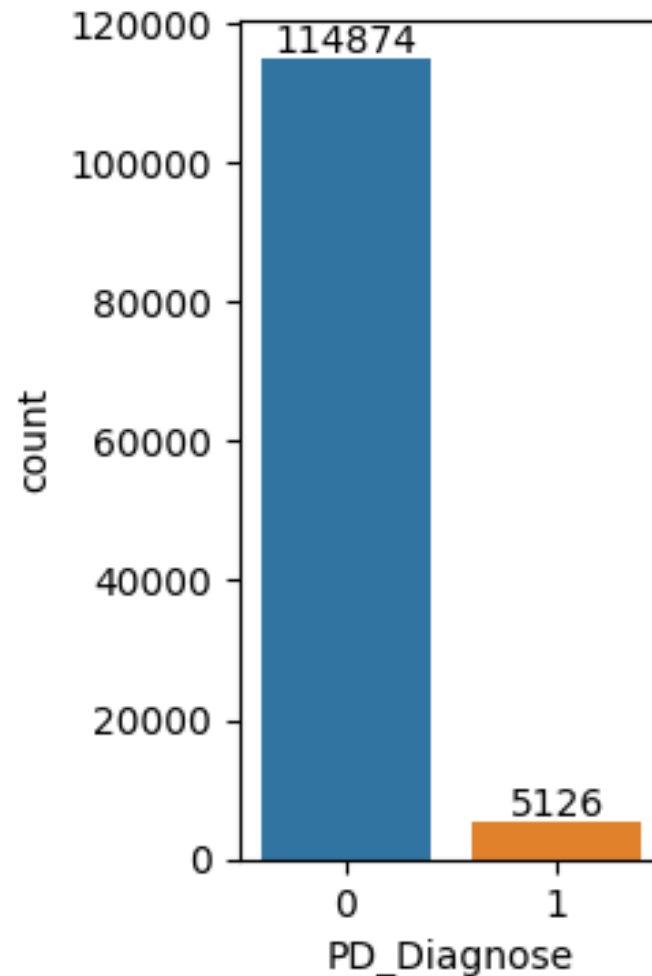
DATA UNDERSTANDING

Numerical Columns
1. ID
2. Age
3. PD_Diagnose

String Columns
1. Family_History
2. Personal_History
3. Current_Stressors
4. Symptom
5. Severity
6. Impact_Onlife
7. Demographics
8. Medical_History
9. Psychiatric_History
10. Substance_Use
11. Coping_Mechanism
12. Social_Support
13. Lifestyle_Factors
14. PD_Diagnose

MODELLING AND RECOMENDATION

Data Engineering

Need to **change** the "string" data type on dataframe into "numeric" data type, because computer only can compute the **number**.

Need to do 2 kind of **Encoding**:

One Hot Encoding

Because each value in one column **has no level** between values, so each columns will be divided according to its respective value with a new **binary value**. Columns that need to do a One Hot Encoding are:
1. Gender
2. Symptom
3. Demographics
4. Medical_History
5. Psychiatric_History
6. Coping_Mechanism
7. Lifestyle_Factors

Label Encoding

Because value in one column can be **sorted / there are levels**, so each value will be **converted** into a number based on its level in that one column. Columns that need to do a Label Encoding are:
1. Family History
2. Personal History
3. Current_Stressors
4. Severity
5. Impact_Onlife
6. Substance_Use
7. Social_Support

MODELLING AND RECOMENDATION

Data Engineering

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 120000 entries, 0 to 119999
Data columns (total 17 columns):
 #   Column              Non-Null Count   Dtype
---  ------              --------------   -----
 0   ID                  120000 non-null  int64
 1   Age                 120000 non-null  int64
 2   Gender              120000 non-null  object
 3   Family_History      120000 non-null  object
 4   Personal_History    120000 non-null  object
 5   Current_Stressors   120000 non-null  object
 6   Symptom             120000 non-null  object
 7   Severity            120000 non-null  object
 8   Impact_Onlife       120000 non-null  object
 9   Demographics        120000 non-null  object
 10  Medical_History     120000 non-null  object
 11  Psychiatric_History 120000 non-null  object
 12  Substance_Use       120000 non-null  object
 13  Coping_Mechanism    120000 non-null  object
 14  Social_Support      120000 non-null  object
 15  Lifestyle_Factors   120000 non-null  object
 16  PD_Diagnose         120000 non-null  int64
```
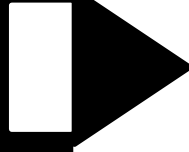
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 120000 entries, 0 to 119999
Data columns (total 34 columns):
 #   Column                                  Non-Null Count   Dtype
---  ------                                  --------------   -----
 0   ID                                      120000 non-null  int64
 1   Age                                     120000 non-null  int64
 2   PD_Diagnose                             120000 non-null  int64
 3   Gender_Female                           120000 non-null  uint8
 4   Gender_Male                             120000 non-null  uint8
 5   Symptom_Chest pain                      120000 non-null  uint8
 6   Symptom_Dizziness                       120000 non-null  uint8
 7   Symptom_Fear of losing control          120000 non-null  uint8
 8   Symptom_Panic attacks                   120000 non-null  uint8
 9   Symptom_Shortness of breath             120000 non-null  uint8
 10  Demographics_Rural                      120000 non-null  uint8
 11  Demographics_Urban                      120000 non-null  uint8
 12  Medical_History_Asthma                  120000 non-null  uint8
 13  Medical_History_Diabetes                120000 non-null  uint8
 14  Medical_History_Heart disease           120000 non-null  uint8
 15  Medical_History_None                    120000 non-null  uint8
 16  Psychiatric_History_Anxiety disorder    120000 non-null  uint8
 17  Psychiatric_History_Bipolar disorder    120000 non-null  uint8
 18  Psychiatric_History_Depressive disorder 120000 non-null  uint8
 19  Psychiatric_History_None                120000 non-null  uint8
 20  Coping_Mechanism_Exercise               120000 non-null  uint8
 21  Coping_Mechanism_Meditation             120000 non-null  uint8
 22  Coping_Mechanism_Seeking therapy        120000 non-null  uint8
 23  Coping_Mechanism_Socializing            120000 non-null  uint8
 24  Lifestyle_Factors_Diet                  120000 non-null  uint8
 25  Lifestyle_Factors_Exercise              120000 non-null  uint8
 26  Lifestyle_Factors_Sleep quality         120000 non-null  uint8
 27  Family_History_AMap                     120000 non-null  int64
 28  Personal_History_AMap                   120000 non-null  int64
 29  Current_Stressors_AMap                  120000 non-null  int64
 30  Severity_AMap                           120000 non-null  int64
 31  Impact_Onlife_AMap                      120000 non-null  int64
 32  Substance_Use_AMap                      120000 non-null  int64
 33  Social_Support_AMap                     120000 non-null  int64
```

MODELLING AND RECOMENDATION

Baseline Modelling

Baseline Modelling Performance				
Model	Recall	AUC	F1 Score	Accuracy
0 Logistic_Regression	0.479284	0.734999	0.570628	0.968083
1 Random_Forest	0.987759	0.993879	0.993842	0.999458
2 Decision_Tree	0.999058	0.999398	0.996712	0.999708
3 Extra_Trees	0.948211	0.974062	0.972477	0.997625
4 Gradient_Boosting	1.000000	0.999956	0.999059	0.999917

Accuracy Level for Baseline Models tend to be high (> 0.95 or above 95%). But because the data used is **Imbalance Data**, it is necessary to do **Undersampling**

MODELLING AND RECOMMENDATION

Undersampling Modelling

Using Undersampling because the data obtained is sufficient and no data synthesis is needed.

	Undersampling Modelling Performance				
	Model	Recall	AUC	F1 Score	Accuracy
0	Logistic_Regression_US	0.975518	0.939651	0.481301	0.906958
1	Random_Forest_US	1.000000	0.992044	0.853355	0.984792
2	Decision_Tree_US	0.999058	0.997873	0.964984	0.996792
3	Extra_Trees_US	1.000000	0.990038	0.822937	0.980958
4	Gradient_Boosting_US	1.000000	0.998561	0.969863	0.997250

Based on the table beside, it can be concluded that the best model is the **Gradient Boosting Classifier**.

1. The highest **Accuracy** value (0.997)
2. The highest **f1 score** (0.969863)
3. High **Recall** Rate (1,000)

MODELLING AND RECOMMENDATION

	Undersampling Modelling Performance				
	Model	Recall	AUC	F1 Score	Accuracy
4	Gradient_Boosting_US	1.000000	0.998561	0.969863	0.997250

The recall value is 1,000, meaning that out of 100 people who are predicted not to have panic disorder, all of them do not experience this disorder

Best Modelling Feature Importance

Best Modelling Confusion Matrix
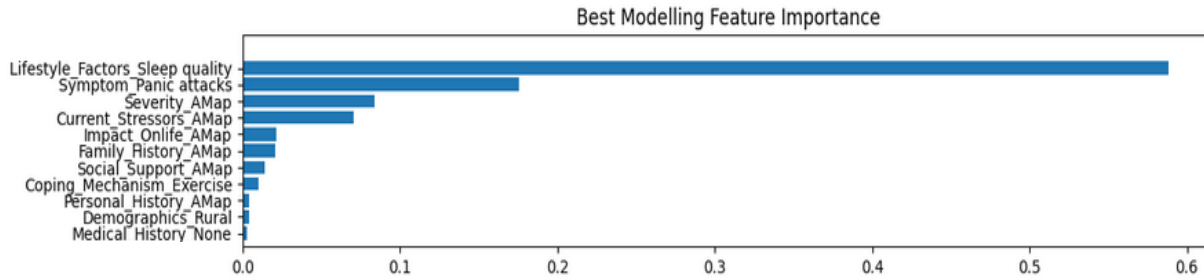
Based on the most influential variables in panic disorder are Lifestyle, Symptom, Severity, Current Stressor, Impact On Life of the respondent's life, Family History, Social Support, and Coping Mechanisms
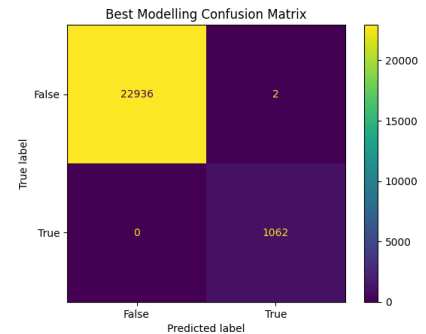
MOST FACTOR IN "PANIC DISORDER"
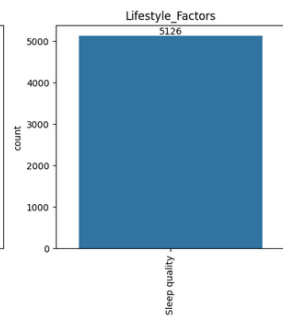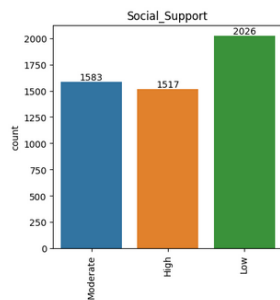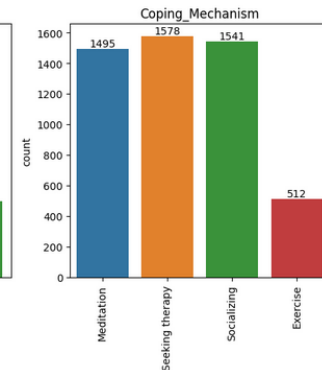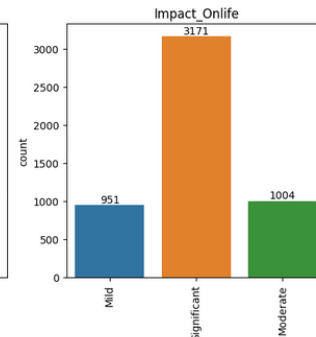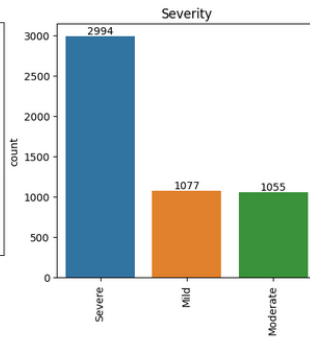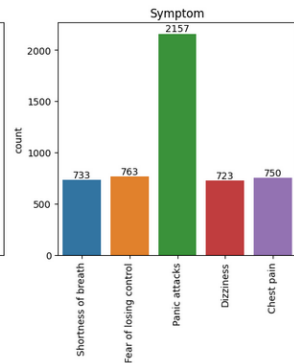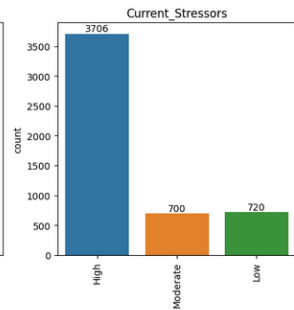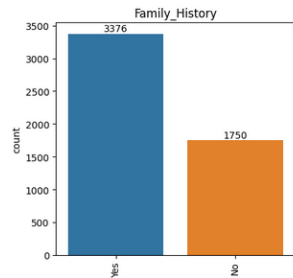
Based on all positive Panic Disorder patients, the highest factor of the most influential variables is:
- **Yes** from the Family History (65.86%)
- **High** from Current Stressors (72.3%)
- **Panic Attacks** from Symptom (42.08%)
- **Severe** from Severity (58.41%)
- **Significant** fromthe Impact On Life (61.86%)
- **Seeking** Therapy from the Coping Mechanism (30.78%)
- **Low** from the Social Support (39.52%)
- **Sleep Quality** from Lifestyle Factors (100%)

MOST FACTOR BASED ON GENDER

Compare by Gender with Highest Value Each Factors		
Gender	Female	Male
mod_Family_History	Yes	Yes
mod_Personal_History	Yes	Yes
mod_Current_Stressors	Moderate	Moderate
mod_Symptom	Shortness of breath	Shortness of breath
mod_Severity	Severe	Severe
mod_Impact_Onlife	Significant	Significant
mod_Demographics	Urban	Urban
mod_Medical_History	None	None
mod_Psychiatric_History	None	None
mod_Substance_Use	None	None
mod_Coping_Mechanism	Socializing	Socializing
mod_Social_Support	Moderate	Moderate
mod_Lifestyle_Factors	Sleep quality	Sleep quality

Try to **compare between men and women** who experience panic disorder

It turns out that both men and women who experience panic disorder overall have the **same background**

DISTRIBUTION "PANIC DISORDER" BY AGE

```
Age
(0, 20]       340
(20, 30]     1032
(30, 40]     1050
(40, 50]     1123
(50, 70]     1581
Name: PD_Diagnose, dtype: int64
```

Try to separate them from positive panic disorder respondents, **divided by age**

- There was a **significant increase** in patients between the ages of 0-20 and the ages of 20-30 (692 patients)
- It turns out that the **older a respondent** is, the **more susceptible** he is to panic disorder

SOCIETY INSIGHT

Panic attack is a sudden onset of **intense fear and triggers** a severe **physical reaction** when perceived danger. When a panic attack occurs, it can result in **losing control**, or even having a **heart attack**.

If a person experiences **repeated and unexpected** panic attacks, and spends a **long time in constant fear**, that person may have a condition called panic disorder.

SOCIETY INSIGHT

- For some people, panic disorder can lead to **agoraphobia** (phobia of crowded environments).
- There is no sure way to prevent Panic Attacks or Panic Disorder. However, some things to relieve can be done by:

  1. Get treatment as soon as possible to help stop it getting worse or becoming more frequent.

  2. Consult an expert for treatment to prevent recurrence or worsening of symptoms.

  3. Get regular physical and social activity, which can play a role in reducing the symptoms of panic attacks.

www.mayoclinic.org

SOCIETY INSIGHT

- Based on the best model chosen, it is hoped that it can **more quickly detect** a person or patient who is suspected of having Panic Disorder. Because the faster the first treatment of a patient can increase the percentage of recovery from that patient.

- From the several main factors that cause Panic Disorder that have been mentioned previously, it can be a **reference for public** to pay more attention to other people around them who are felt to have positive signs to be able to help **immediately**.

www.mayoclinic.org

REFERENCES

- https://www.unicef.org/indonesia/id/kesehatan-mental/artikel/serangan-panik
- https://www.nhs.uk/mental-health/conditions/generalised-anxiety-disorder/overview/
- https://www.mayoclinic.org/diseases-conditions/panic-attacks/symptoms-causes/syc-20376021

:)

Thankyou.

Reach me out anytime:

Linked in   M

<u>LINK PROJECT</u>