STRESS RELIEVER

(Check your stress and get relieved)

Sanagiri Durga Bhavani

Date: 8th June 2023

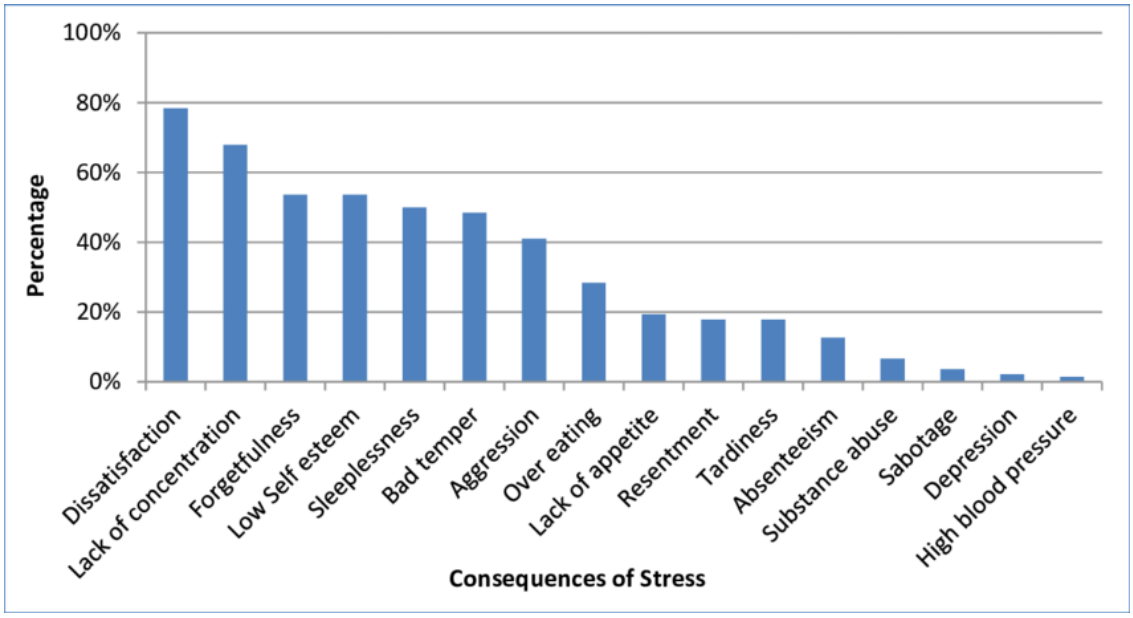
ABSTRACT:

Now a days, We can see that many people, many youngsters mostly are getting depressed easily and facing lot of stress due to many of the reasons like study, responsibilities, life, love, career etc., Due to these kind of reasons they are prone to depression which is costing many lives. But, when they are getting depressed, they need to get relief from that stress to avoid the consequences of that. So, for this the main objective here using is machine learning at first to detect the stress and the stress levels .After detection, some actions are performed for relieving that stress those actions can be of doctor consultancy or playing games or listening some jokes or stories which can boost up their nature .And, Hence we can help them in controlling the stress of that person.

1.0 INTRODUCTION:

Stress is the body's reaction to harmful situations -- whether they're real or perceived. When you feel threatened, a chemical reaction occurs in your body that allows you to act in a way to prevent injury. This reaction is known as "fight-or-flight" or the stress response. During the stress response, your heart rate increases, breathing quickens, muscles tighten, and blood pressure rises. Stress affects us all. You may notice symptoms of stress when disciplining your kids, during busy times at work, when managing your finances, or when coping with a challenging relationship. Stress is everywhere. And while a little stress is OK but some stress is actually beneficial -- too much stress can wear you down and make you sick, both mentally and physically.

The first step to controlling stress is to know the symptoms of stress. But recognizing stress symptoms may be harder than you think. Most of us are so used to being stressed, we often don't know we are stressed until we are at the breaking point. Stress can affect all parts of your life, including your emotions, behaviours, thinking ability, and physical health. No part of the body is immune. But, because people handle stress differently, symptoms of stress can vary. Symptoms can be vague and may be the same as those caused by medical conditions. So it is important to discuss them with your doctor.



Here, we can clearly observe the consequences of stress, so to overcome these consequences , this application will be more helpful in detecting the stress earlier and cure it through doctor or some other factors.

2.0 ASSESSMENT

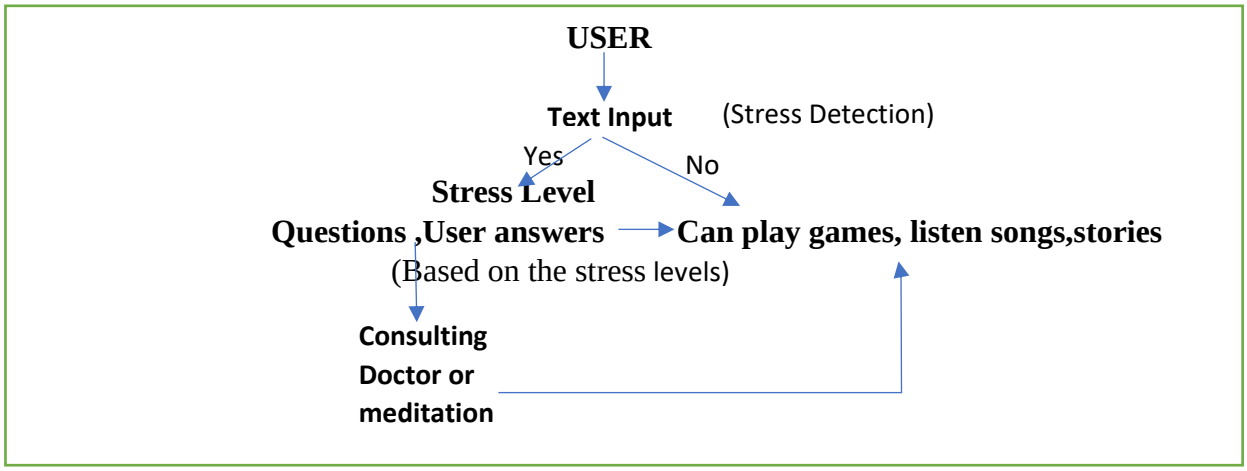
2.1 Customer Need Assessment

Initially , we take input from the user/customer for further proceedings.

- **Detection of Stress:** At first , we need to detect whether the user is having stress or not, that we can find out using machine learning algorithm by taking the text input from the user and also few questions asked by us like the symptoms ,are they experiencing them or not.
- **Detection of Stress levels**: If the user is having the stress, then we go further for finding the stress level. Based on those stress levels only, we can decide whether it is serious or not.So then itself, doctor sessions are arranged accordingly.
- **Doctor Consultancy:** The sessions can be arranged with the willingness of the user, only after the user agrees for Psychiatrist sessions, they are scheduled.
- **Stress Relieving Activities**: Stress can be managed by the following activities also, but here those all activities are recommended by the doctor only. Only the doctor recommended genres will be displayed there.

    - Podcast Stories
    - Jokes
    - Songs
    - Games
    - Meditation Sessions

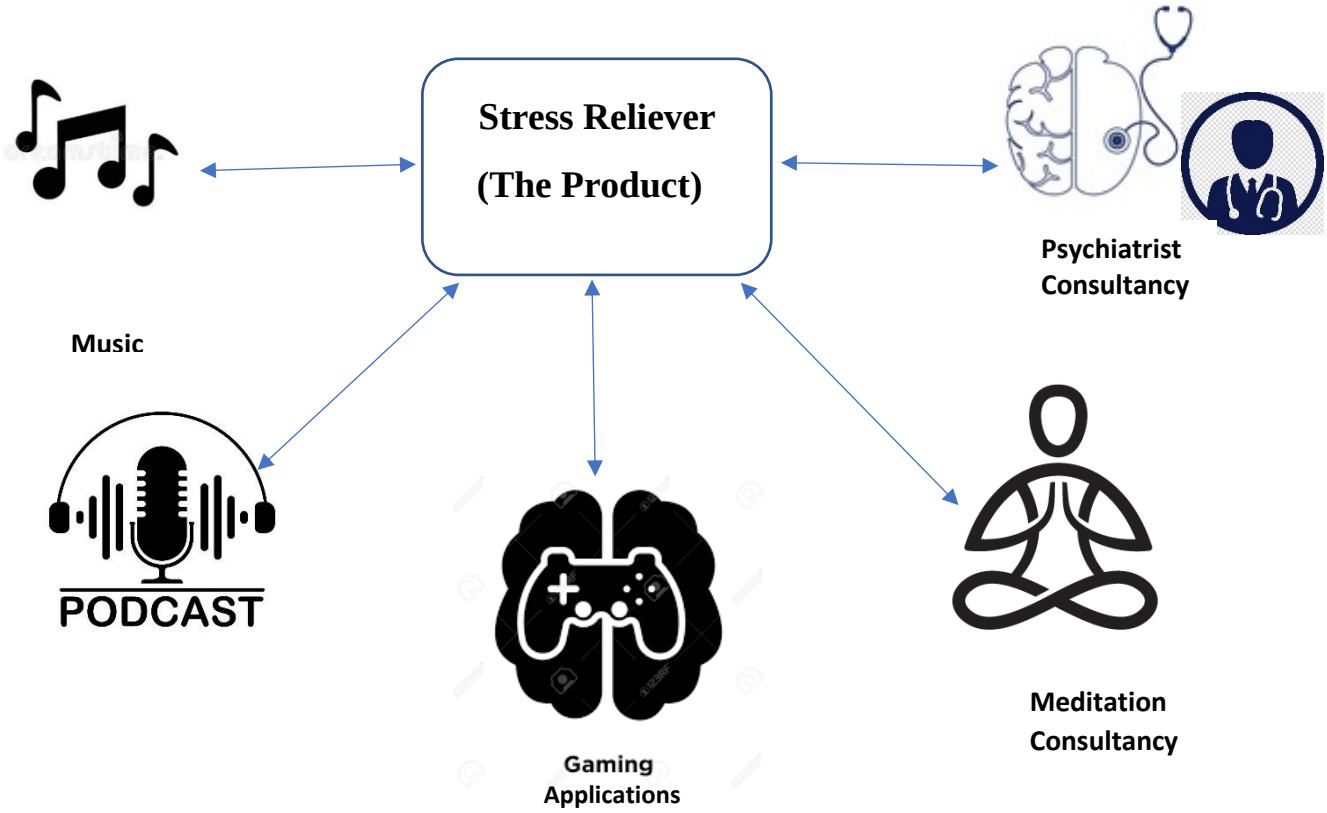
- **Meditation Consultancy** :If the user wanted to choose meditation as a part to get relief from the stress, it will be addressed to the medical consultant and they will arrange the sessions.



2.2 Market / Business Need Assessment

Since , in this product we use consultancies , consulters, gaming, podcasts, songs, We make use of many available resources/applications which is linked up financially with our product.

Associated with the product



So, this product is associated with medical field, gaming field and also with the entertainment field. These will be considered as associated partners with the product. As they are associated ,when any user is identified as stress victim ,they are forwarded to the doctor(Psychiatrist) for sessions scheduling,that means we are sending the patients to those specific doctors and also meditation consultant,if that user don't want to go for doctor they can be scheduled for meditation sessions for that we can associate with few meditation blocks with that consultant.To spend time with our product , this can also be associated with the already built gaming applications ,here ,indirectly we are promoting those gaming applications and providing them the reach. Podcast ,in this podcast some motivational stories, jokes which are already available in other platforms, so here we can benefit financially by associating with those applications.As, we are promoting and providing them the reach.

3.0 TARGET SPECIFICATIONS

- Use of Machine learning in detecting stress and its levels
- Arranging Sessions with Psychiatrist's if needed with willingness of the user
- Arranging Meditation sessions if needed by consulting them with the willingness of the user
- Providing gaming applications which can be used to decrease the stress levels
- Providing podcast which contains motivational stories and jokes ,which can be useful to increase the user's mood and boost their inner strength
- Music is mostly used term to boost up the mood , so here it contains songs and relieving music which can create a pleasant atmosphere
- By this product, this can help youngsters and also few people who are getting affected by the stress to decrease that kind of feeling and also it can help them to identify the stress and can prevent the feeling of depression.

4.0 EXTERNAL SEARCHES

4.1 Symptoms of Stress and their core traits

The body's autonomic nervous system controls your heart rate, breathing, vision changes and more. Its built-in stress response, the "fight-or-flight response," helps the body face stressful situations. When a person has long-term (chronic) stress, continued activation of the stress response causes wear and tear on the body. Physical, emotional and behavioural symptoms develop.

Physical symptoms of stress include:

- Aches and pains.
- Chest pain or a feeling like your heart is racing.
- Exhaustion or trouble sleeping.
- Headaches,dizziness or shaking.
- High blood pressure.
- Muscle tension or jaw clenching.
- Stomach or digestive problems.
- Trouble having sex.
- Weak immune system.

Stress can lead to emotional and mental symptoms like:

- Anxiety or irritability
- Depression.
- Panic attacks.
- Sadness.

Often, people with chronic stress try to manage it with unhealthy behaviors, including:

- Drinking alcohol too much or too often.

- Gambling.
- Overeating or developing an eating disorder.
- Participating compulsively in sex, shopping or internet browsing.
- Smoking.
- Using drugs.

This article is provided by a Cleveland Clinic medical professional.

4.2 Machine Learning in Stress Detection

The dataset can be found in Kaggle. Initially , we take text input from the user by asking them ‘How are you feeling today?” , based on their input only we need to classify them ,whether they are having stress or not.

In [4]:
```
human_stress.head(10)
```

Out[4]:

	subreddit	post_id	sentence_range	text	label	confidence	social_timestamp
0	ptsd	8601tu	(15, 20)	He said he had not felt that way before, sugge...	1	0.8	1521614353
1	assistance	8lbrx9	(0, 5)	Hey there r/assistance, Not sure if this is th...	0	1.0	1527009817
2	ptsd	9ch1zh	(15, 20)	My mom then hit me with the newspaper and it s...	1	0.8	1535935605
3	relationships	7rorpp	[5, 10]	until i met my new boyfriend, he is amazing, h...	1	0.6	1516429555
4	survivorsofabuse	9p2gbc	[0, 5]	October is Domestic Violence Awareness Month a...	1	0.8	1539809005
5	relationships	7tx7et	(30, 35)	I think he doesn't want to put in the effort f...	1	1.0	1517274027
6	domesticviolence	7iphly	[25, 30]	It was a big company so luckily I didn't have ...	0	0.8	1512854409
7	anxiety	5m3k80	(5, 10)	It cleared up and I was okay but. On Monday ...	1	0.8	1483582174
8	relationships	7nhy1v	(50, 55)	I actually give an assistant half my emergency...	1	0.6	1514843984
9	assistance	61eiq6	[15, 20]	I just feel like the street life has fucked my...	1	1.0	1490428087

Here , we consider text and label fields, label 1 indicates stress and 0 indicates no stress.

4.3 Detection of Stress Levels using Machine Learning

The dataset can be found from Kaggle, there we take few inputs from the users about their body performance and detect stress level and categorize them to low ,medium, high. 0-low, 1-medium, 2-high

In [2]:

```
data=pd.read_csv('/kaggle/input/input-data/Stress-Lysis.csv')
data.head()  # displays the first five rows of the dataframe
```

Out[2]:

	Humidity	Temperature	Step_count	Stress_Level
0	21.33	90.33	123	1
1	21.41	90.41	93	1
2	27.12	96.12	196	2
3	27.64	96.64	177	2
4	10.87	79.87	87	0

Based on the human's physical activity, the stress levels of the human being are detected and analyzed here. A dataset of 2001 samples is provided for human body humidity, body temperature and the number of steps taken by the user. Three different classifications of stress are performed, low stress, normal stress, and high stress.

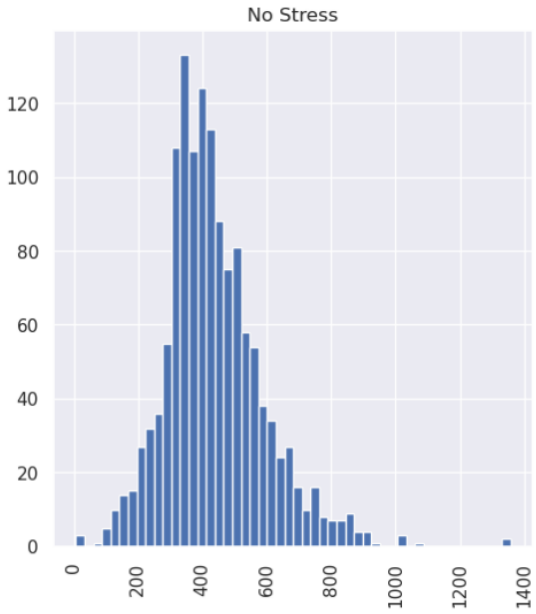
4.4 Bench Marking

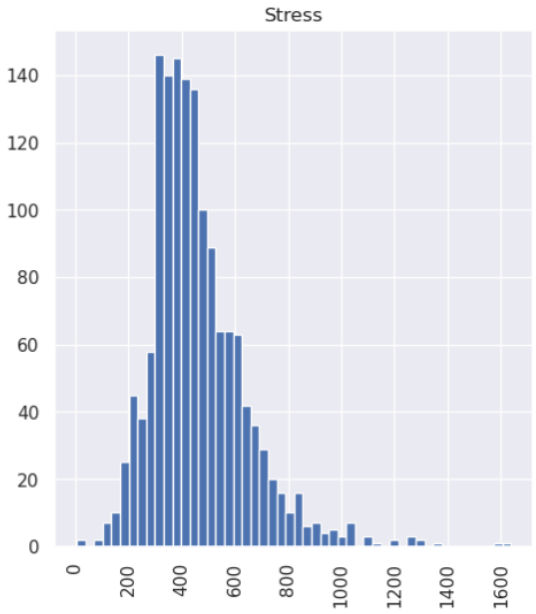
The performance and accuracy of the model can be visualised for the taken datasets

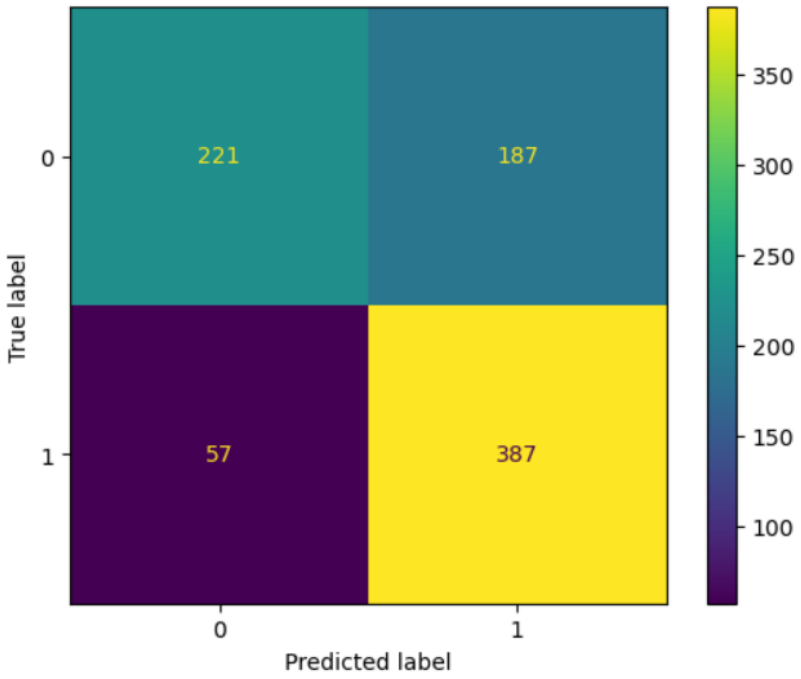
Stress detection

]:

	count	mean	std	min	25%	50%	75%	max
subreddit								
ptsd	584.0	435.296233	157.677362	6.0	330.00	417.5	524.25	1271.0
relationships	552.0	463.898551	167.292838	142.0	354.00	428.0	539.00	1277.0
anxiety	503.0	447.763419	168.015419	6.0	338.00	418.0	532.50	1358.0
domesticviolence	316.0	436.512658	165.901395	6.0	335.00	406.5	512.25	1308.0
assistance	289.0	429.705882	143.763236	32.0	339.00	417.0	503.00	915.0
survivorsofabuse	245.0	473.485714	194.551557	88.0	348.00	437.0	559.00	1606.0
homeless	168.0	449.851190	177.114248	155.0	342.75	425.5	525.25	1281.0
almosthomeless	80.0	447.412500	208.517777	116.0	329.50	417.5	519.00	1639.0
stress	64.0	505.593750	203.001816	172.0	361.50	492.5	601.25	1354.0
food_pantry	37.0	379.756757	151.760302	89.0	284.00	357.0	459.00	717.0

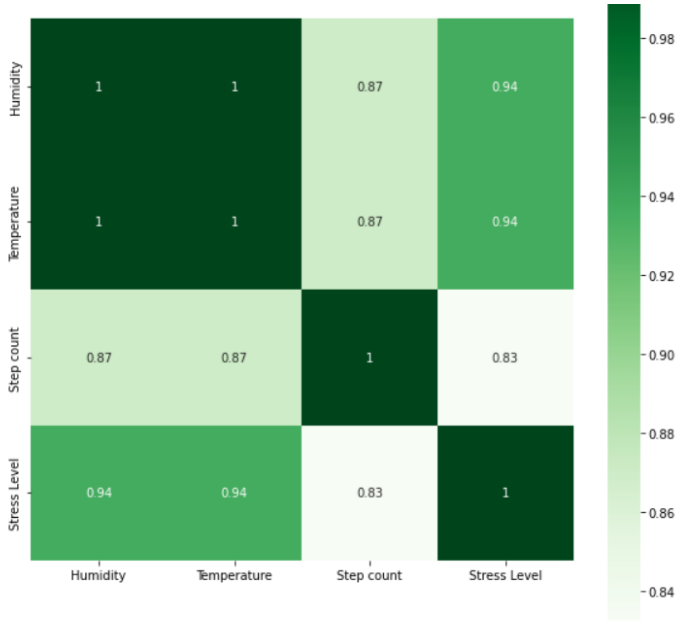

No Stress
120
100
80
60
40
20
0
0
200
400
600
800
1000
1200
1400

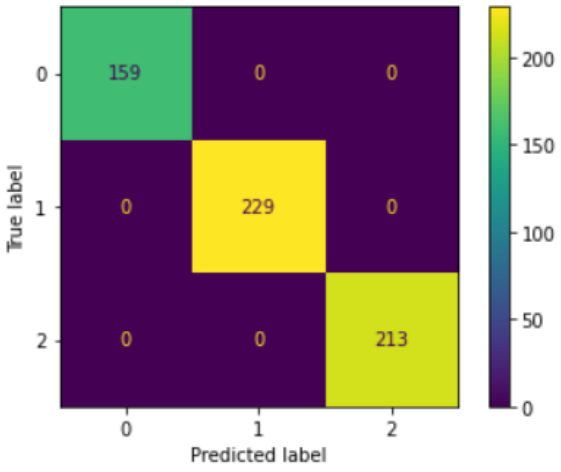

Stress
140
120
100
80
60
40
20
0
0
200
400
600
800
1000
1200
1400
1600


221
187
57
387
0
1
True label
0
1
Predicted label
350
300
250
200
150
100

For Stress level Detection

	Humidity	Temperature	Step count	Stress Level
count	2001.000000	2001.000000	2001.000000	2001.000000
mean	20.000000	89.000000	100.141429	1.104448
std	5.777833	5.777833	58.182948	0.771094
min	10.000000	79.000000	0.000000	0.000000
25%	15.000000	84.000000	50.000000	0.000000
50%	20.000000	89.000000	101.000000	1.000000
75%	25.000000	94.000000	150.000000	2.000000
max	30.000000	99.000000	200.000000	2.000000





4.5 Applicable Regulations/Patents/Constraints

- Privacy laws as we are collecting user's data.
- Permissions from gaming applications, podcasts, music companies as we use them in this product .
- Patents on Machine learning algorithms used.
- Product verification.
- Perfect legal bond between the associated partners like doctors, meditation masters, consulters.
- Provide permission for third party cookies to monitor service of the product

4.6 Business Opportunity

This product can also help in the terms of providing business opportunity.In this product we follow through consultancy channels so we can connect to many consulters and everyone will get their commissions. The applications we use also can be calculated in terms of business as some apps need reach, views ,promotion.we do them using our product.We can also get investment for this product.

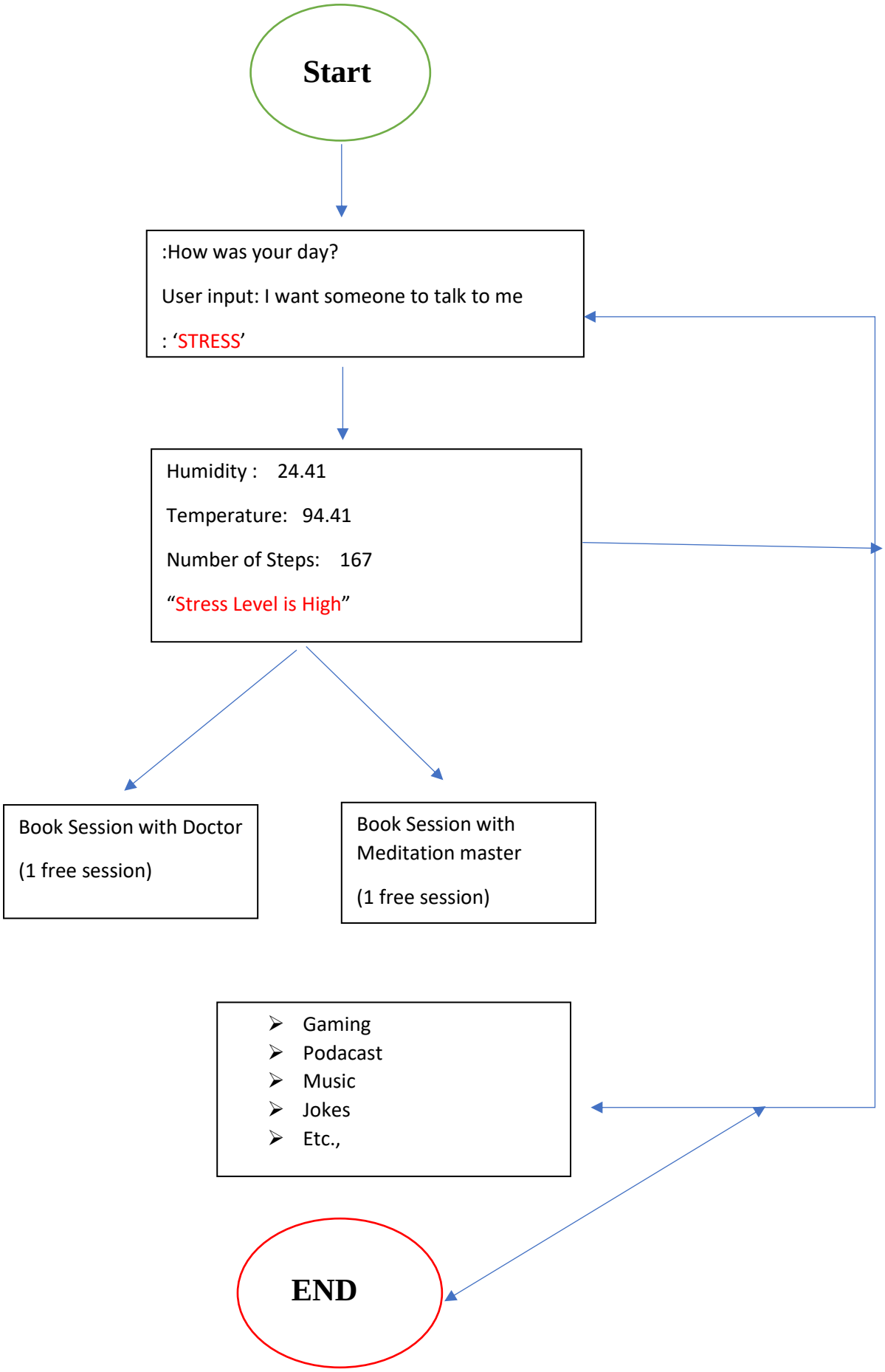
5.0 Concept Generation

Here the basic concept is identifying stress and stress levels if stress is present and based on the stress level the further actions are addressed to the user. So, this helps the user to identify the symptoms of the stress earlier, Even though they don't know that they are suffering with stress and at which level. The identification is based upon the users input, the data sets we considered are from Kaggle data sets, for identification of stress we took one data set and for stress level detection we took another data set where we collect humidity , body temperature and number of steps.

6.0 Concept Selection and Development

1. One dataset is considered where it contains sentences(text) and label, label 1 indicates stress ,0 indicates no stress.
2. Produce stop words, tokenise
3. Train the model using binary classifier
4. Convert the users input statement to tokens and get output that, whether that user is having stress or not
5. If that user is having stress,detect stress levl whether it is low or medium or high.
6. For stress level, consider one data set containing humidity, temperature ,number of steps and stress level.
7. Stress levels are 0,1,2 = low,medium,high ;respectively
8. Train the model and provide the input, get the result.
9. Based on the stress level, further arrangement of sessions or meditation or some other activities using the willingness of the user.

7.0 Final Product design



8.0 PRODUCT DETAILS

8.1 How Does it work?

- It works based on the ML Algorithms like Naive bayes, Decision tress, binary classifiers, logistic regressions , SVM etc.,

8.2 Budget

- Based upon the software's and consulters we use and consult respectively.

8.3 Teams Required

- Application Developers
- Financial Assistance team
- Application Management team
- Team for managing associated partners

9.0 CODE IMPLEMENTATION:

Code implementation

For Stress Detection

Include dataset when performing this program

```
import pandas as pd
import numpy as np
data = pd.read_csv("stress.csv")
print(data.head())
```

```
          subreddit post_id  ... syntax_fk_grade sentiment
0             ptsd  8601tu  ...        3.253573 -0.002742
1       assistance  8lbrx9  ...        8.828316  0.292857
2             ptsd  9ch1zh  ...        7.841667  0.011894
3    relationships  7rorpp  ...        4.104027  0.141671
4  survivorsofabuse  9p2gbc  ...        7.910952 -0.204167

[5 rows x 116 columns]
```

```
import matplotlib.pyplot as plt
from wordcloud import WordCloud, STOPWORDS, ImageColorGenerator
text = " ".join(i for i in data.text)
stopwords = set(STOPWORDS)
wordcloud = WordCloud(stopwords=stopwords,
                      background_color="white").generate(text)
plt.figure( figsize=(15,10))
plt.imshow(wordcloud, interpolation='bilinear')
plt.axis("off")
plt.show()
```


```
data["label"] = data["label"].map({0: "No Stress", 1: "Stress"})
data = data[["text", "label"]]
print(data.head())
```

```
                                                text      label
0  said felt way sugget go rest trigger ahead you...     Stress
1  hey rassist sure right place post goe  im curr...  No Stress
2  mom hit newspap shock would know dont like pla...     Stress
3  met new boyfriend amaz kind sweet good student...     Stress
4  octob domest violenc awar month domest violenc...     Stress
```

```
from sklearn.feature_extraction.text import CountVectorizer
from sklearn.model_selection import train_test_split
from sklearn.naive_bayes import BernoulliNB
x = np.array(data["text"])
y = np.array(data["label"])
cv = CountVectorizer()
X = cv.fit_transform(x)
xtrain, xtest, ytrain, ytest = train_test_split(X, y, test_size=0.33, random_state=42)
model = BernoulliNB()
model.fit(xtrain, ytrain)
```

```
user = input("Enter a Text: ")
data = cv.transform([user]).toarray()
output = model.predict(data)
print(output)
```

```
Enter a Text: People need to take care of their mental health
['No Stress']
```

```
Enter a Text: Sometime I feel like I need some help
['Stress']
```

CODE IMPLEMENTATION:

For Stress Level Detection

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline

import os
for dirname, _, filenames in os.walk('/kaggle/input-data'):
    for filename in filenames:
        print(os.path.join(dirname, filename))
```

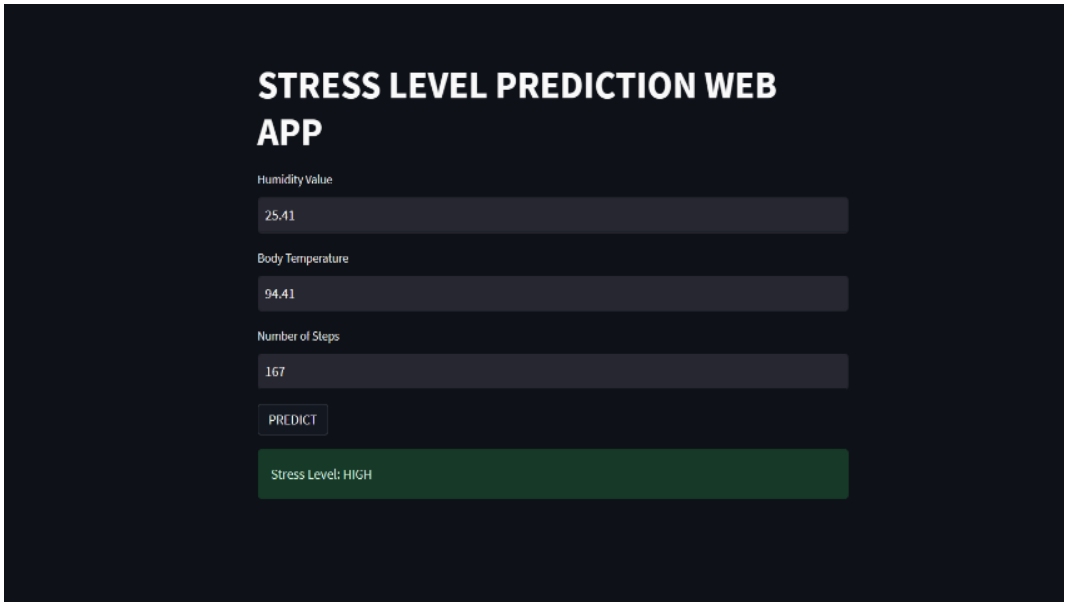
```
data=pd.read_csv('/kaggle/input/input-data/Stress-Lysis.csv')
data.head()  # displays the first five rows of the dataframe
```

	Humidity	Temperature	Step_count	Stress_Level
0	21.33	90.33	123	1
1	21.41	90.41	93	1
2	27.12	96.12	196	2
3	27.64	96.64	177	2
4	10.87	79.87	87	0

```
from sklearn.model_selection import train_test_split
X=data.drop(['Stress_Level'],axis=1)
y=data['Stress_Level']
X_train,X_test,y_train,y_test = train_test_split(X,y,test_size=0.2,random_state=2)
from sklearn.linear_model import LogisticRegression
regressor = LogisticRegression(C=1.0,random_state=2)
regressor.fit(X_train,y_train)
import pickle
filename = 'stress_trained.sav'
pickle.dump(classifier,open(filename,'wb'))
```

```
loaded_model = pickle.load(open('stress_trained.sav','rb'))

!pip install -q streamlit
import numpy as np
import pickle
import streamlit as st

# Loading the trained model
loaded_model = pickle.load(open('stress_trained.sav','rb'))
# Replace path over stress_trained.sav

def stresslevel_prediction(input_data):

    #changing the input data into numpy array
    id_np_array = np.asarray(input_data)
    id_reshaped = id_np_array.reshape(1,-1)

    prediction = loaded_model.predict(id_reshaped)
    print(prediction)

    if(prediction[0]==0):
        return "Stress Level: LOW"
    elif(prediction[0]==1):
       return "Stress Level: MEDIUM"
    else:
        return "Stress Level: HIGH"

def main():

    st.title('STRESS LEVEL PREDICTION WEB APP')
```

```
    if(prediction[0]==0):
        return "Stress Level: LOW"
    elif(prediction[0]==1):
       return "Stress Level: MEDIUM"
    else:
        return "Stress Level: HIGH"

def main():

    st.title('STRESS LEVEL PREDICTION WEB APP')

    Humidity = st.text_input('Humidity Value')
    Temperature = st.text_input('Body Temperature')
    Step_count = st.text_input('Number of Steps')

    # Prediction code
    diagnosis = ''

    if st.button('PREDICT'):
        diagnosis = stresslevel_prediction([Humidity, Temperature, Step_count])

    st.success(diagnosis)

if __name__=='__main__':
    main()
```



*Note: This is not the required product ,it is just code implementation for detecting stress levels

10.0 CONCLUSIONS

- This product can be beneficial in identifying the stress earlier than the user.
- Can be beneficial for business also
- Doctor(Psychiatrist) gets benefited as we are promoting him
- User can get 1 free session with the doctor or meditation master
- Few applications using in this product gets benefited as we are promoting .

REFERENCES

https://www.google.com/

https://thecleverprogrammer.com/

https://www.kaggle.com/

https://humanjourney.us/health-and-education-in-the-modern-world-section/mind-and-health/

https://my.clevelandclinic.org/health/articles/11874-stress