This is evalution test for the project SIRA in GSOC'25 under the umbrella organization HumanAI.

The test is to do evalution test for any other project and I have choose **AI-Powered Behavioral Analysis for Suicide Prevention, Substance Use, and Mental Health Crisis Detection with Longitudinal Geospatial Crisis Trend Analysis** - **ISSR 3 Test**

```
# install necessary libraries
!pip install --upgrade praw
!pip install vaderSentiment --use-deprecated=legacy-resolver
!pip install textblob --use-deprecated=legacy-resolver
!pip install datasets --use-deprecated=legacy-resolver
!pip install nltk --use-deprecated=legacy-resolver
```

```
Collecting praw
  Downloading praw-7.8.1-py3-none-any.whl.metadata (9.4 kB)
Collecting prawcore<3,>=2.4 (from praw)
  Downloading prawcore-2.4.0-py3-none-any.whl.metadata (5.0 kB)
Collecting update_checker>=0.18 (from praw)
  Downloading update_checker-0.18.0-py3-none-any.whl.metadata (2.3 kB)
Requirement already satisfied: websocket-client>=0.54.0 in /usr/local/lib/python3.11/dist-packages (from praw) (1.8.0)
Requirement already satisfied: requests<3.0,>=2.6.0 in /usr/local/lib/python3.11/dist-packages (from prawcore<3,>=2.4->
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests<3.0,>
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.11/dist-packages (from requests<3.0,>=2.6.0->praw
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.11/dist-packages (from requests<3.0,>=2.6.0
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.11/dist-packages (from requests<3.0,>=2.6.0-
Downloading praw-7.8.1-py3-none-any.whl (189 kB)
   ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 189.3/189.3 kB 12.5 MB/s eta 0:00:00
Downloading prawcore-2.4.0-py3-none-any.whl (17 kB)
Downloading update_checker-0.18.0-py3-none-any.whl (7.0 kB)
Installing collected packages: update_checker, prawcore, praw
Successfully installed praw-7.8.1 prawcore-2.4.0 update_checker-0.18.0
Collecting vaderSentiment
  Downloading vaderSentiment-3.3.2-py2.py3-none-any.whl (125 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 126.0/126.0 kB 8.5 MB/s eta 0:00:00
Requirement already satisfied: requests in /usr/local/lib/python3.11/dist-packages (from vaderSentiment) (2.32.3)
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Installing collected packages: vaderSentiment
Successfully installed vaderSentiment-3.3.2
Requirement already satisfied: textblob in /usr/local/lib/python3.11/dist-packages (0.19.0)
Requirement already satisfied: nltk>=3.9 in /usr/local/lib/python3.11/dist-packages (from textblob) (3.9.1)
Requirement already satisfied: click in /usr/local/lib/python3.11/dist-packages (from nltk>=3.9->textblob) (8.1.8)
Requirement already satisfied: joblib in /usr/local/lib/python3.11/dist-packages (from nltk>=3.9->textblob) (1.4.2)
Requirement already satisfied: regex>=2021.8.3 in /usr/local/lib/python3.11/dist-packages (from nltk>=3.9->textblob) (2
Requirement already satisfied: tqdm in /usr/local/lib/python3.11/dist-packages (from nltk>=3.9->textblob) (4.67.1)
Collecting datasets
  Downloading datasets-3.4.1-py3-none-any.whl (487 kB)
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Requirement already satisfied: filelock in /usr/local/lib/python3.11/dist-packages (from datasets) (3.18.0)
Requirement already satisfied: numpy>=1.17 in /usr/local/lib/python3.11/dist-packages (from datasets) (2.0.2)
Requirement already satisfied: pyarrow>=15.0.0 in /usr/local/lib/python3.11/dist-packages (from datasets) (18.1.0)
Collecting dill<0.3.9,>=0.3.0 (from datasets)
  Downloading dill-0.3.8-py3-none-any.whl (116 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 116.3/116.3 kB 10.2 MB/s eta 0:00:00
Requirement already satisfied: pandas in /usr/local/lib/python3.11/dist-packages (from datasets) (2.2.2)
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Requirement already satisfied: tqdm>=4.66.3 in /usr/local/lib/python3.11/dist-packages (from datasets) (4.67.1)
Collecting xxhash (from datasets)
  Downloading xxhash-3.5.0-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (194 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 194.8/194.8 kB 14.5 MB/s eta 0:00:00
Collecting multiprocess<0.70.17 (from datasets)
  Downloading multiprocess-0.70.16-py311-none-any.whl (143 kB)
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Collecting fsspec[http]<=2024.12.0,>=2023.1.0 (from datasets)
  Downloading fsspec-2024.12.0-py3-none-any.whl (183 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 183.9/183.9 kB 14.5 MB/s eta 0:00:00
Requirement already satisfied: aiohttp in /usr/local/lib/python3.11/dist-packages (from datasets) (3.11.14)
Requirement already satisfied: huggingface-hub>=0.24.0 in /usr/local/lib/python3.11/dist-packages (from datasets) (0.29
```

```
# import libraries
import requests
import requests.auth
import pandas as pd
import numpy as np
import torch
import praw
from transformers import BertTokenizer, BertForSequenceClassification, Trainer, TrainingArguments, pipeline
```

```
from sklearn.model_selection import train_test_split
from datasets import Dataset,ClassLabel
import time
import re
import string
import nltk
from nltk.corpus import stopwords
from vaderSentiment.vaderSentiment import SentimentIntensityAnalyzer
import matplotlib.pyplot as plt
import folium
import pandas as pd
from branca.colormap import linear
nltk.download('stopwords')
```

```
[nltk_data] Downloading package stopwords to /root/nltk_data...
[nltk_data]   Unzipping corpora/stopwords.zip.
True
```

Task 1: Social Media Data Extraction & Preprocessing (API Handling & Text Cleaning)

```
# using Reddit api to extract posts
# Not using search queries because they rarely gives relevant data

reddit = praw.Reddit(
    client_id="XXXXXXXXXXXXXXXXXXXXXX",
    client_secret="XXXXXXXXXXXXXXXXXXXXX",
    user_agent="XXXXXXXXXXXXXXXXXXXXXX",
    check_for_async=False
)

# testing
for submission in reddit.subreddit("depression").hot(limit=5):
    print(submission.title)
```

```
Our most-broken and least-understood rules is "helpers may not invite private contact as a first resort", so we've made a
Regular check-in post, with information about our rules and wikis
I have cried so much, im tired
I've spent 90% of my freetime in bed since I was 12
Every Time I Fall Asleep I’m Hoping my eyes Never Open
```

```
# Function to get posts beyond 1000 limit
def get_posts(subredditname, limit=5000):
    print("getting subreddit "+subredditname+"...")
    posts = []
    last_post = None
    subreddit = reddit.subreddit(subredditname)
    while len(posts) < limit:
        if last_post:
            new_posts = list(subreddit.hot(limit=1111, params={'before': last_post}))
        else:
            new_posts = list(subreddit.hot(limit=None))

        if not new_posts:
            break

        posts.extend(new_posts)
        last_post = new_posts[-1].fullname

        time.sleep(1)

    return posts[:limit]


# Clean the text removing unwanted charecters, emojis, links etc
def cleantext(text):
  text = str(text).lower()
  text = re.sub(r'\[.*?\]', '', text)
  text = re.sub(r'https?://\S+|www\.\S+', '', text)
  text = re.sub(r'\s+', ' ', text.strip())
  text = re.sub(r'<.*?>+', '', text)
  text = re.sub(r'[%s]' % re.escape(string.punctuation), '', text)
  text = re.sub(r'\n', '', text)
  text = re.sub(r'\w*\d\w*', '', text)
  text = re.sub(r'[^\x00-\x7F]+', '', text)
  text = remove_stopwords(text)
  return text


# Function to retrieve data from the post object
def get_data(post):
```

```
def get_data(post):
  # get post Post ID, Timestamp, Title, Content, Auther, likes, comments, subreddit
  content=cleantext(post.selftext)
  return [post.id, post.created_utc, post.title, content, post.selftext, post.author, post.ups, post.num_comments, post.subred

# Stop word removal
def remove_stopwords(text):
    words = text.split()
    clean_words = [word for word in words if word.lower() not in stop_words]
    return ' '.join(clean_words)

stop_words = set(stopwords.words('english'))
```

```
# Extract posts from subreddits related to mental health, suicide, addiction etc and store

subreddits = ["depression","DrugAddiction","Addiction","SuicideWatch","SelfHarm"]


data=[]
c=0
for sr in subreddits:
  posts = get_posts(sr,limit = 10000)
  for post in posts:
    data.append(get_data(post))
    c+=1

df=pd.DataFrame(data,columns=['ID', 'Timestamp', 'Title', 'Content', 'Content_row', 'Auther', 'Likes', 'Comments', 'Subreddi
```

```
getting subreddit depression...
getting subreddit DrugAddiction...
getting subreddit Addiction...
getting subreddit SuicideWatch...
getting subreddit SelfHarm...
```

```
# save the df
df.to_csv("data.csv",index=False)
df.head(10)
```

	ID	Timestamp	Title	Content	Content_row	Auther	Likes	Comments	Subreddit
0	doqwow	1.572361e+09	Our most-broken and least-understood rules is ...	understand people reply immediately op invitat...	We understand that most people who reply immed...	SQLwitch	2363	177	depression
1	1frqlk0	1.727565e+09	Regular check-in post, with information about ...	welcome rdepressions checkin post place take m...	Welcome to /r/depression's check-in post - a p...	SQLwitch	42	263	depression
2	1jie7of	1.742776e+09	I have cried so much, im tired	name josh im im lot pain friends spend time th...	My name is Josh, im 33 and im in a lot of pain...	CucumberCultural3760	126	32	depression
3	1ji2co9	1.742745e+09	I've spent 90% of my freetime in bed since I w...	title says ive bedrotting since spend time lay...	As the title says I've been bedrotting since I...	hylskrik	292	27	depression
4	1jiawlg	1.742767e+09	Being an underachiever with depression is a do...	least overachievers peoples respect theyre see...	At least overachievers have other people's res...	Nitrogen70	88	7	depression
5	1jik7b0	1.742797e+09	Every Time I Fall Asleep I'm Hoping my eyes Ne...	im life virtual im unemployed keep getting rej...	I'm 18 about to 19 and once I am My life is Vi...	ValTorni	19	2	depression
6	1jicxob	1.742772e+09	IT REALLY DID GET BETTER	year bet rotting way scared talk woman really ...	Before this year I was bet rotting being way t...	plaguepsycho419	55	29	depression
7	1jidgvr	1.742774e+09	i don't wanna get better.	honestly find comfort depressed happy much wan...	i honestly find more comfort in being depresse...	currencycollectors	38	4	depression
8	1jif66w	1.742779e+09	Gender roles make me feel worthless	im got late start life im independent dont gre...	I'm 28m and I got a late start in life. I'm no...	throwaway_harhar	25	11	depression

Task 2.1: Sentiment & Crisis Risk Classification (NLP & Text Processing)

Using VEDAR Sentiment analyzer

```
# Applying VADER
# Tested Textblob, VADER is better

analyzer = SentimentIntensityAnalyzer()

# Function to run VADER model
def get_sentiment(text):
  score = analyzer.polarity_scores(text)["compound"]
  if score<-0.3:
    return "Negative"
  elif score<0.3:
    return "Nuetral"
  else:
    return "Positive"

texts = ["I just want to commit suicide","I am so happy today","I am sad but I am ok"]
for text in texts:
  print(text," : ",get_sentiment(text))

# test the model
text = input("Enter your post: ")
print("sentiment: ",get_sentiment(text))
```

```
I just want to commit suicide  :  Negative
I am so happy today  :  Positive
I am sad but I am ok  :  Nuetral
Enter your post: I had a coffee today
sentiment:  Nuetral
```

```
df = pd.read_csv(r"/content/data.csv")
```

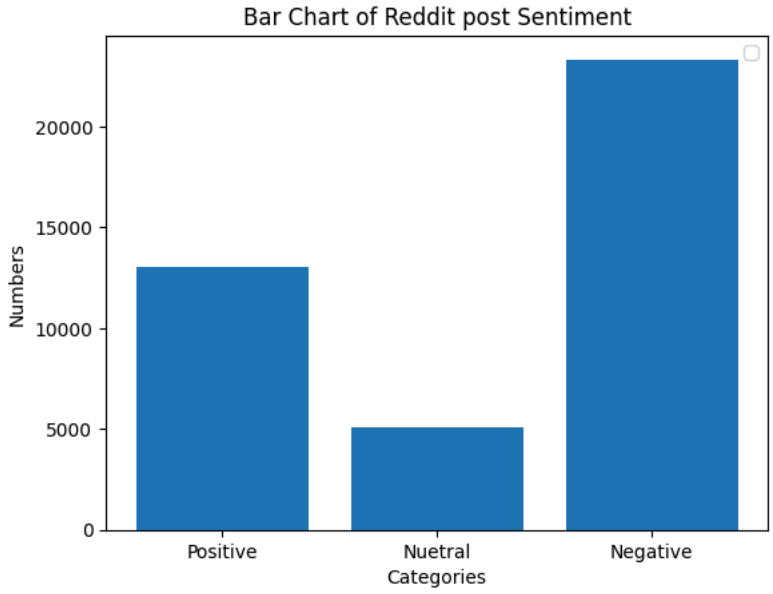
```
# Checking on posts retrieved
# result, it works good most of the time, but not great on lengthy posts
posts_1 = df['Content_row'].tolist()
for post in posts_1[2:12]:
  print(post," : ",get_sentiment(post))
  print('======')
```

```
As the title says I've been bedrotting since I was 12. I spend most of my time laying in my bed. I can't sit upright i

When I was younger I didn't spend all my time in bed because I had friends and activities to do. I could sit upright i

For fun I crochet in bed. I draw in bed. I watch videos in bed. I get a dopamine rush when I think about all the fun t

I don't know if this is hope or delusion. I make an effort not to lay in bed all day sometimes. But usually it's just s

People tell me to just get out of bed, but I'm split between wanting to and not wanting to. I don't know what I'm supp

I could go for walks but I'm so tired, and nobody wants to walk with me. I could go alone but then I might as well jus

Don't get me wrong though. I don't want to have it like this. I want to be normal and be able to make friends and enjo

No one helped me in the start. Now it's so much harder. But I don't feel like I can reach out for help. Everyone has i

When I have to get out of bed I get ready in the bathroom. I look very presentable. I don't look like someone who can'

I can get out of bed for the tasks I understand. I understand taking a shower and going to the bathroom. I understand

But I don't understand preparing a meal for mealtime or brushing my teeth in the morning and evening. Most of the time

Maybe I just stay in bed because I really really hate myself.

I claim not to but actions speak louder than words.  :  Positive
======
At least overachievers have other people’s respect. They’re seen as heroic for being successful in spite of their illn

I saw it happen in high school. Straight A+ students with mental problems get more sympathy than kids with poor grades

Everyone knows that people are only treated with respect when they earn it. If you haven’t earned anyone’s respect by
======
I’m 18 about to 19 and once I am My life is Virtual over. I’m Unemployed and keep getting rejected from jobs.
My gf is having a child due in 1-2 Months, and I know the second it’s born Im either going to be homeless or destitute
I keep getting told to go to a physiatrist but there no point.
I just hope that one of these days I just don’t wake up, Just for me to Close my eyes one last time, never to open aga
======
Before this year I was bet rotting being way to scared to talk to woman and I was really lonely and I was depressed. I
======
i honestly find more comfort in being depressed than being happy. as much as i want to get better, it seems hopeless. i
======
I’m 28m and I got a late start in life. I’m not independent and I don’t have a great job, but I make more than enough
======
```

```
======
I, 23 F, no purpose, no home, no dreams, now finally getting real progress of planning my suicide. I have distanced mys

I wanted to give everyone a clean slate. I would do it outside my city/hometown, in an apartment no one knows I even l

I've felt like this for a year now. I've been waiting for it to pass because that's how it should be right? but it has

No one knows any of this. There's days where I'm itching to tell someone but I always back out at the last minute. I'm

I love my family, friends, and ex boyfriend. I'm sorry for pushing you all away the past 2 months. I'm just so tired.
======
```

```
results = {"Positive":0,"Nuetral":0,"Negative":0,}
posts_1 = [post for post in posts_1 if post not in [None, np.nan]]
for post in posts_1:
  results[get_sentiment(post)]+=1

plt.bar(list(results.keys()), list(results.values()))

# Add labels and title
plt.xlabel("Categories")
plt.ylabel("Numbers")
plt.title("Bar Chart of Reddit post Sentiment")

# Add legend
plt.legend()

# Show the plot
plt.show()
```

```
<ipython-input-20-2933f663fbfb>:14: UserWarning: No artists with labels found to put in legend.  Note that artists whose
  plt.legend()
```



Task 2.2: Using Bert to detect high-risk crisis terms.

```
# Use TF-IDF or Word Embeddings (BERT, Word2Vec) to detect high-risk crisis terms.
# Training bert-uncase from custom dataset from kaggle
# Dataset: https://www.kaggle.com/datasets/nikhileswarkomati/suicide-watch

# Load dataset
new_df = pd.read_csv(r'/content/Suicide_Detection.csv')
new_df['label']=new_df['class']
new_df=new_df[['text','label']]
new_df.head()
```

	text	label
0	Ex Wife Threatening SuicideRecently I left my ...	suicide
1	Am I weird I don't get affected by compliments...	non-suicide
2	Finally 2020 is almost over... So I can never ...	non-suicide
3	i need helpjust help me im crying so hard	suicide
4	I'm so lostHello, my name is Adam (16) and I'v...	suicide

```
# preprocess
# shuffle and take a small chunk to avoid long training time

dd={"suicide":1,"non-suicide":0}
# coding the label and cleaning the text
new_df['text'] = new_df['text'].apply(cleantext)
new_df['label']=new_df['label'].replace(dd)

new_df = new_df.sample(frac=1).reset_index(drop=True)
new_df=new_df[0:20000]
new_df.head(10)
```

```
<ipython-input-9-e3700cae5911>:9: FutureWarning: Downcasting behavior in `replace` is deprecated and will be removed in a
  new_df['label']=new_df['label'].replace(dd)
```

	text	label
0	hangingthinking drop hanging balcony terrified...	1
1	happy holloween may final day spooktober shall...	0
2	go online aloneat moment suicide doesnt seems ...	1
3	want diei well recently one trigger another im...	1
4	remember happened yesterday day changed november	0
5	friend tried commit suicide night help himone ...	1
6	wanna hang family leaves mallive always alone ...	1
7	discord mods keep asking im	0
8	guess consider vent fuck iti wanna die im even...	1
9	loneliness hello suffered loneliness isolation...	1

```
# Split the dataset
train_texts, val_texts, train_labels, val_labels = train_test_split(new_df['text'].tolist(), new_df['label'].tolist(), test_

# Load the BERT tokenizer
tokenizer = BertTokenizer.from_pretrained('bert-base-uncased')

# Tokenize the texts
train_encodings = tokenizer(train_texts, truncation=True, padding=True, max_length=128)
val_encodings = tokenizer(val_texts, truncation=True, padding=True, max_length=128)

# Dataset wrapper object
class Dataset(torch.utils.data.Dataset):
    def __init__(self, encodings, labels):
        self.encodings = encodings
        self.labels = labels

    def __getitem__(self, idx):
        item = {key: torch.tensor(val[idx]) for key, val in self.encodings.items()}  # Keep tensors on CPU
        item['labels'] = torch.tensor(self.labels[idx])  # Keep tensors on CPU
        return item

    def __len__(self):
        return len(self.labels)

train_dataset = Dataset(train_encodings, train_labels)
val_dataset = Dataset(val_encodings, val_labels)

device = torch.device('cuda') if torch.cuda.is_available() else torch.device('cpu')

model = BertForSequenceClassification.from_pretrained('bert-base-uncased', num_labels=3).to(device)
training_args = TrainingArguments(
    output_dir='./results',
    num_train_epochs=3,
    per_device_train_batch_size=16,
    per_device_eval_batch_size=64,
```

```
    warmup_steps=500,
    weight_decay=0.01,
    logging_dir='./logs',
    logging_steps=10,
    evaluation_strategy="epoch",
)


trainer = Trainer(
    model=model,
    args=training_args,
    train_dataset=train_dataset,
    eval_dataset=val_dataset
)

trainer.train()
trainer.evaluate()
```

```
Some weights of BertForSequenceClassification were not initialized from the model checkpoint at bert-base-uncased and are
You should probably TRAIN this model on a down-stream task to be able to use it for predictions and inference.
/usr/local/lib/python3.11/dist-packages/transformers/training_args.py:1594: FutureWarning: `evaluation_strategy` is depre
  warnings.warn(
```

[3000/3000 18:45, Epoch 3/3]

Epoch	Training Loss	Validation Loss
1	0.158400	0.186256
2	0.103200	0.122147
3	0.079600	0.164121

[63/63 00:25]

```
{'eval_loss': 0.16412091255187988,
 'eval_runtime': 25.2512,
 'eval_samples_per_second': 158.408,
 'eval_steps_per_second': 2.495,
 'epoch': 3.0}
```

```
# Save the model and test

model.save_pretrained('./my_model')
tokenizer.save_pretrained('./my_model')


# Load the model and tokenizer
model = BertForSequenceClassification.from_pretrained('./my_model')
tokenizer = BertTokenizer.from_pretrained('./my_model')

# Create a pipeline
classifier = pipeline('text-classification', model=model, tokenizer=tokenizer)

def bertclassification(text):
  result = classifier(text)
  if result[0]['label']=='LABEL_1' and result[0]['score']>0.9:
    sentiment = "High-Risk"
  elif result[0]['label']=='LABEL_1' and result[0]['score']<0.9:
    sentiment = "Moderate Concern"
  elif result[0]['label']=='LABEL_0' and result[0]['score']>0.9:
    sentiment = "Moderate Concern"
  else:
    sentiment = "Low Concern"
  return sentiment
# Example prediction
text = "I should end my life, I don't know what to do anymore, no money, no life, addicted to drugs"
print(bertclassification(text))
text = "I am doing ok today, went out and played some football, then had food with my girlfriend"
print(bertclassification(text))
```

```
Device set to use cuda:0
Moderate Concern
Moderate Concern
```

```
classifier(post)[0]
```

```
{'label': 'LABEL_0', 'score': 0.9984997510910034}
```

```
# Checking on real data

for post in posts_1[2:11]:
```

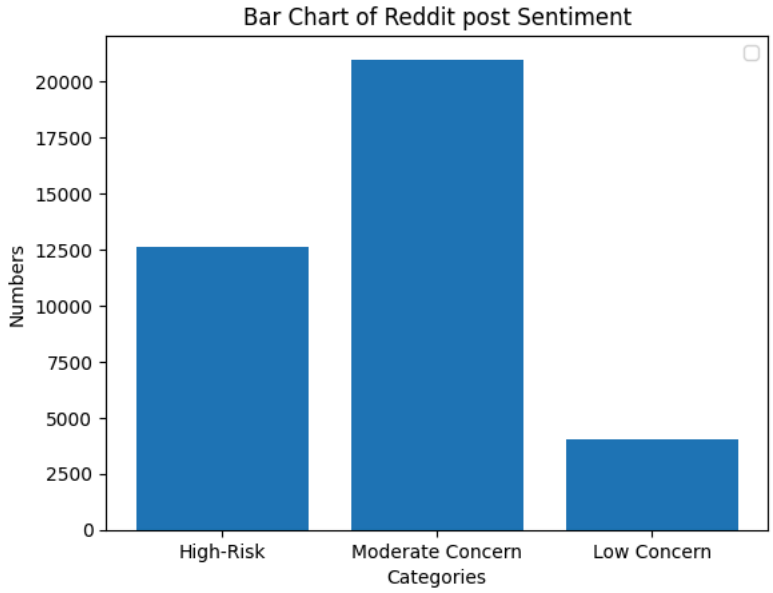
```
  try:
    print(post)
    result = classifier(post)
    print(result)
    sentiment = bertclassification(post)
    print(sentiment)
    print()
  except Exception as e:
    print(e)
    continue
```

```
For fun I crochet in bed. I draw in bed. I watch videos in bed. I get a dopamine rush when I think about all the fun t

I don't know if this is hope or delusion. I make an effort not to lay in bed all day sometimes. But usually it's just s

People tell me to just get out of bed, but I'm split between wanting to and not wanting to. I don't know what I'm supp

I could go for walks but I'm so tired, and nobody wants to walk with me. I could go alone but then I might as well jus

Don't get me wrong though. I don't want to have it like this. I want to be normal and be able to make friends and enjo

No one helped me in the start. Now it's so much harder. But I don't feel like I can reach out for help. Everyone has i

When I have to get out of bed I get ready in the bathroom. I look very presentable. I don't look like someone who can'

I can get out of bed for the tasks I understand. I understand taking a shower and going to the bathroom. I understand

But I don't understand preparing a meal for mealtime or brushing my teeth in the morning and evening. Most of the time

Maybe I just stay in bed because I really really hate myself.

I claim not to but actions speak louder than words.
The size of tensor a (742) must match the size of tensor b (512) at non-singleton dimension 1
At least overachievers have other people’s respect. They’re seen as heroic for being successful in spite of their illn

I saw it happen in high school. Straight A+ students with mental problems get more sympathy than kids with poor grades

Everyone knows that people are only treated with respect when they earn it. If you haven’t earned anyone’s respect by
[{'label': 'LABEL_1', 'score': 0.9956886172294617}]
High-Risk

I’m 18 about to 19 and once I am My life is Virtual over. I’m Unemployed and keep getting rejected from jobs.
My gf is having a child due in 1-2 Months, and I know the second it’s born Im either going to be homeless or destitute
I keep getting told to go to a physiatrist but there no point.
I just hope that one of these days I just don’t wake up, Just for me to Close my eyes one last time, never to open aga
[{'label': 'LABEL_1', 'score': 0.9853277206420898}]
High-Risk

Before this year I was bet rotting being way to scared to talk to woman and I was really lonely and I was depressed. I
[{'label': 'LABEL_0', 'score': 0.9955251812934875}]
Moderate Concern

i honestly find more comfort in being depressed than being happy. as much as i want to get better, it seems hopeless. i
[{'label': 'LABEL_0', 'score': 0.8622225522994995}]
Low Concern

I’m 28m and I got a late start in life. I’m not independent and I don’t have a great job, but I make more than enough
[{'label': 'LABEL_1', 'score': 0.9793633222579956}]
High-Risk

It’s not that there’s anything in particular fucked up with my life. I’m not poor. I’m not lonely. I’m not grieving an
[{'label': 'LABEL_1', 'score': 0.9937829375267029}]
High-Risk

Does this happen to anyone else? I will genuinely be at rock bottom, can't get outta bed, can't eat, etc... And then I
[{'label': 'LABEL_0', 'score': 0.9927791953086853}]
Moderate Concern
```

```
results = {"High-Risk":0,"Moderate Concern":0,"Low Concern":0,}

for post in posts_1[2:]:
  try:
    sentiment = bertclassification(post)
    results[sentiment]+=1
  except Exception as e:
    #print(e)
    continue

plt.bar(list(results.keys()), list(results.values()))

# Add labels and title
plt.xlabel("Categories")
plt.ylabel("Numbers")
```

```
plt.title("Bar Chart of Reddit post Sentiment")

# Add legend
plt.legend()

# Show the plot
plt.show()
```

```
<ipython-input-23-8dd47c97d5db>:19: UserWarning: No artists with labels found to put in legend.  Note that artists whose
  plt.legend()
```



Task 3: Crisis Geolocation & Mapping

I couldn't find a single post with location mentioning, it feels like people wanted to stay anonymous, but there is a high chance that while people anonymous these people interract with their curresponding city subreddits, using that assumption here I have checked users location based on their interactions with city subreddits.

```
# Creating a database of cities
# Database source: https://public.opendatasoft.com/explore/dataset/geonames-all-cities-with-a-population-1000/table/?disjunc

# The downloaded dataset csv is corrupted, hence reading the row file and processing
with open("C:\\Users\\haleel\\Downloads\\tempgsoc\\cities.csv", 'r', encoding='utf-8') as f:
    lines = f.readlines()

columns=["name","country","country_code","population","coordinates"]
data_cities=[]
cities=[]
c=0
lines = lines[1:]

for line in lines:
  line_s = line.split(";")
  if len(line_s)==20:
    c+=1
    # Taking cities with population more than 30k
    if int(line_s[13])>30000:
      city = line_s[2].replace(" ","")
      city = city.replace("'","")
      data_cities.append([city,line_s[7],line_s[6],line_s[13],line_s[19]])
      cities.append(city.lower())

data = pd.DataFrame(data_cities[:], columns=columns)
print(len(cities))
data.head()
```

15984

	name	country	country_code	population	coordinates
0	NIAValencia	Philippines	PH	83591	7.90639, 125.09417\n
1	Toledo	Philippines	PH	207314	10.3773, 123.6386\n
2	Tinongan	Philippines	PH	62146	10.215, 123.03528\n
3	Solano	Philippines	PH	36222	16.51918, 121.18124\n
4	SantaAna	Philippines	PH	47158	15.0955, 120.767\n

```
# Check every user's comment history available and see where they are from.
# Taking a sample from the data since it takes a long time to scan through
# The users comment data
df=pd.read_csv("C:\\Users\\haleel\\Downloads\\tempgsoc\\data.csv")
users = df['Auther'].tolist()
users = [user for user in users if user not in [None or np.nan]]
usercitydirectory = {}
srvisits = {}

c=0
index=5001
for username in users[index+2:]:
  visitedsubs=[]
  try:
    # Part-1
    user = reddit.redditor(username)
    comments=user.comments.new(limit=1000)
    time.sleep(1)
    #print("user checked")
    for comment in comments:
      # assumed visited city subreddit
      city=comment.subreddit.display_name.lower()
      # check whether it is a city name
      if city in cities:
        if username in usercitydirectory:
          if city in usercitydirectory[username]:
            usercitydirectory[username][city]+=1
          else:
            usercitydirectory[username][city] = 1
        else:
          usercitydirectory[username] = {}
          usercitydirectory[username][city] = 1

      # Part-2

      # subreddit visited
      sr=comment.subreddit.display_name.lower()
      if sr not in srvisits and sr not in visitedsubs:
        srvisits[sr]=1
        visitedsubs.append(sr)
      elif sr not in visitedsubs:
        srvisits[sr]+=1
        visitedsubs.append(sr)
    c+=1
    if c==10000:
      print("10000 users scanned")
      break
  except Exception as e:
    print("error",e)
    continue
```

Show hidden output

```
# save the variables as it is expensive to run it everytime
with open("srvisits.json", "w", encoding="utf-8") as f:
    json.dump(srvisits, f, indent=4)

with open("usercitydirectory.json", "w", encoding="utf-8") as f:
    json.dump(usercitydirectory, f, indent=4)
```

```
# check the if city is detected
limit=10
for user in usercitydirectory:
  print(user, usercitydirectory[user])
  limit-=1
```

```
  if limit==0:
    break
```

```
hylskrik {'oslo': 1}
Nitrogen70 {'batman': 2}
currencycollectors {'kandi': 1}
impadfootbutemo {'launceston': 1}
yogesh_gosavi {'nashik': 56}
Mysterious-Lead3621 {'london': 3}
Shonkbonk {'sanantonio': 63, 'austin': 61, 'sanmarcos': 157, 'houston': 27, 'sugarland': 1, 'asheville': 1, 'dallas': 1,
ExplanationDazzling1 {'chicago': 9, 'istanbul': 3, 'denver': 5, 'atlanta': 1, 'logansquare': 2, 'logan': 2}
Blue_Steel_415 {'rome': 1}
Horror_Average_5141 {'pittsburgh': 11}
```

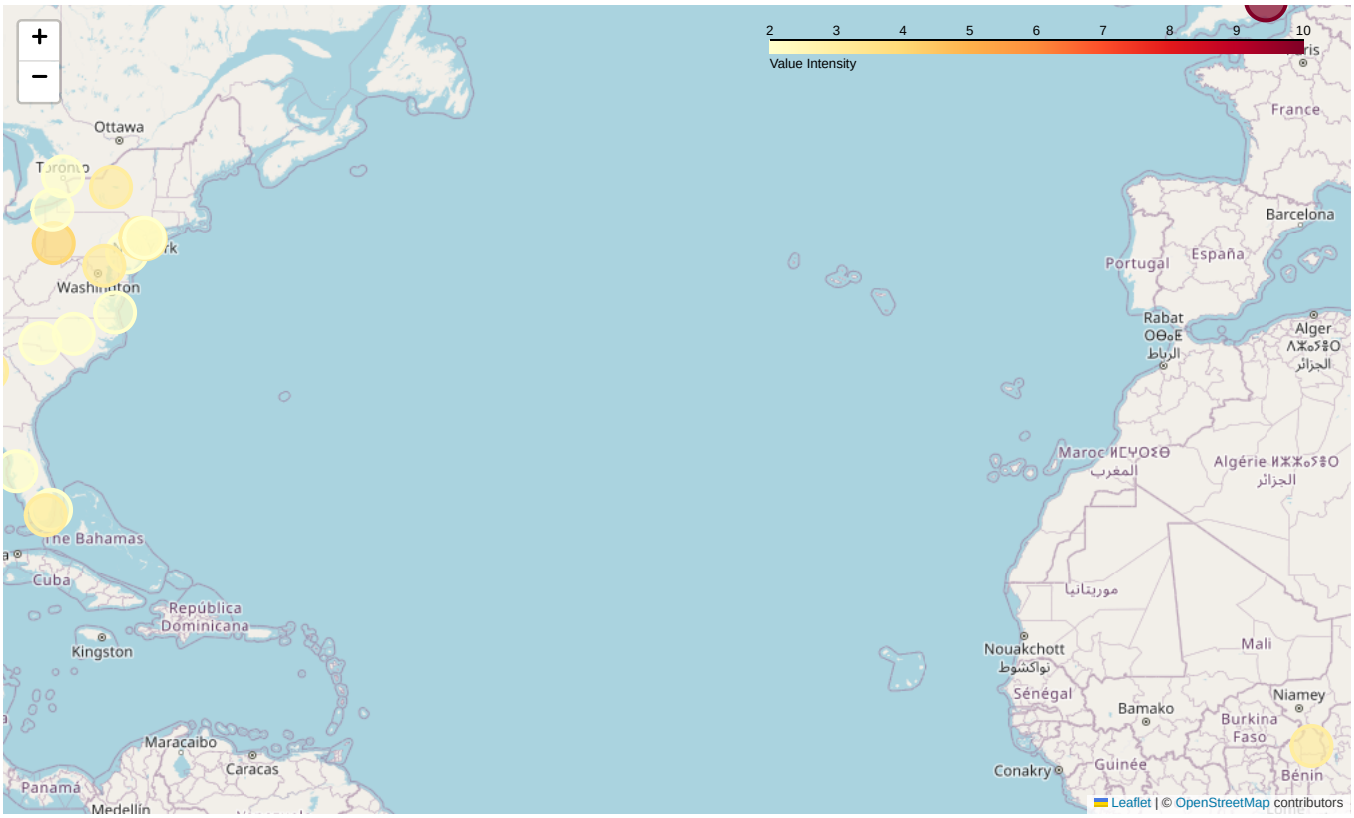
```
# Get the distribuition of location of Authors
# And count of Authors in each city.
city_count = {}

for user in usercitydirectory:
  for city in usercitydirectory[user]:
    if city in city_count:
        city_count[city] += 1
    else:
        city_count[city] = 1

# Check the algorithm
limit=10
for city in city_count:
  print(city,city_count[city])
  limit-=1
  if limit==0:
    break
```

```
oslo 1
batman 6
kandi 3
launceston 1
nashik 1
london 10
sanantonio 1
austin 4
sanmarcos 1
houston 5
```

```
# Plot the distribuition

# Collect coordinates from cities dataframe
fullcitydata = {
    "City": [],
    "Latitude": [],
    "Longitude": [],
    "Value": []
}

def getcords(city):
  for _,row in data.iterrows():
    if row['name'].lower() == city:
      cords = row['coordinates'].strip('\n')
      return [float(i) for i in cords.split(', ')]

for city in city_count:
  # only considering cities with more than 1 entry
  if city_count[city]>=2:
    fullcitydata["City"].append(city)
    fullcitydata["Value"].append(city_count[city])
    lat,lon = getcords(city)
    fullcitydata["Latitude"].append(lat)
    fullcitydata["Longitude"].append(lon)
```

```
# removing city names gay and batman because those subreddits are dedicated for
# different purpose
for srr in ['gay','batman']:
    ii = fullcitydata['City'].index(srr)
    fullcitydata['City'].pop(ii)
    fullcitydata['Latitude'].pop(ii)
    fullcitydata['Longitude'].pop(ii)
    fullcitydata['Value'].pop(ii)
```

```
# plot the cities with the count as color griadient.
# more darker color means a concentratin of users there

df = pd.DataFrame(fullcitydata)

# Create a base map
m = folium.Map(location=[df["Latitude"].mean(), df["Longitude"].mean()], zoom_start=4)

# Create a colormap based on values
colormap = linear.YlOrRd_09.scale(df["Value"].min(), df["Value"].max())  # Yellow to Red gradient

# Add markers to the map
for _, row in df.iterrows():
    folium.CircleMarker(
        location=(row["Latitude"], row["Longitude"]),
        radius=15,  # Size of marker
        color=colormap(row["Value"]),
        fill=True,
        fill_color=colormap(row["Value"]),
        fill_opacity=0.7,
        popup=f"{row['City']}: {row['Value']}"
    ).add_to(m)

# Add color legend to the map
colormap.caption = "Value Intensity"
colormap.add_to(m)

# Save and display the map
m.save("map.html")
m
```



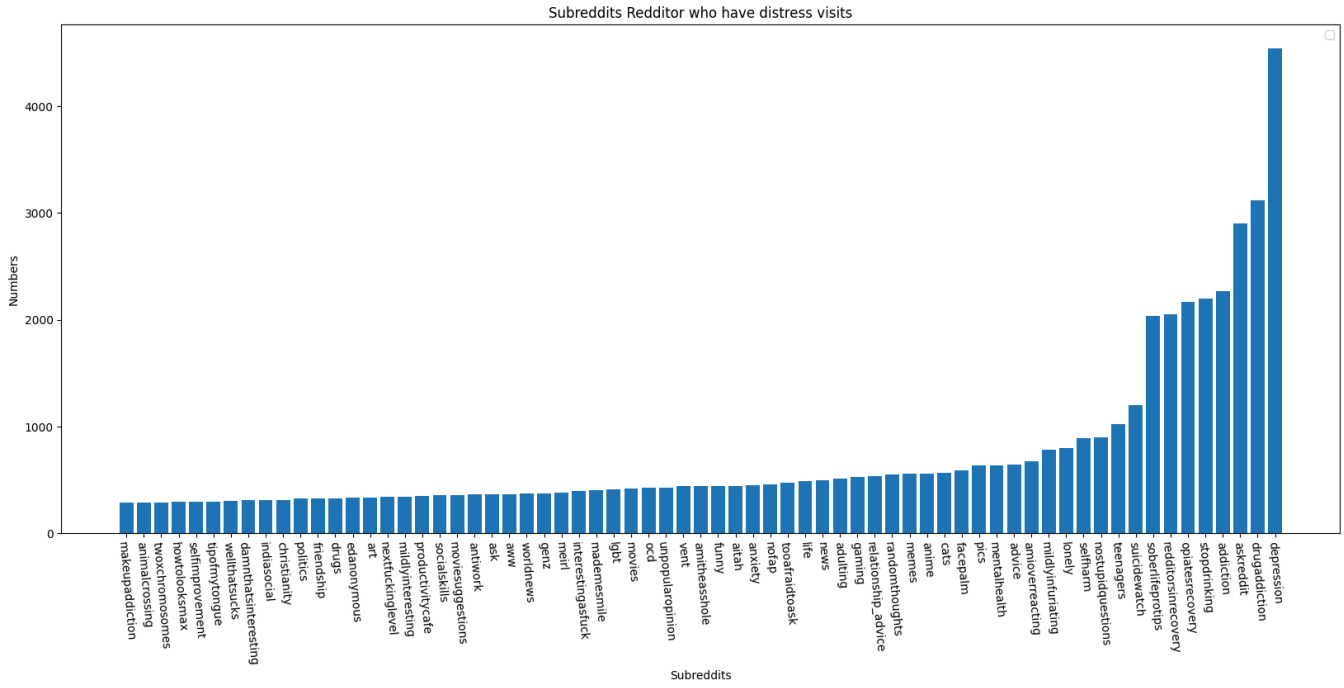
Some Extra work, trying to gain some more insights from this data

```
# Check every users comment history
# To see which all subreddits people visit the most
# Note that even a person visits a sr more than once it is counted as onc


sorted_srvisits = dict(sorted(srvisits.items(), key=lambda x: x[1]))
srs=[]
count = []
limit=20
for sr in sorted_srvisits:
```

```
  if not sorted_srvisits[sr]<=20:
    srs.append(sr)
    count.append(sorted_srvisits[sr])
```

```
sorted_srvisits = dict(sorted(srvisits.items(), key=lambda x: x[1]))
srs=[]
count = []
limit=280
for sr in sorted_srvisits:
  if not sorted_srvisits[sr]<=limit:
    srs.append(sr)
    count.append(sorted_srvisits[sr])

plt.figure(figsize=(20, 8))
plt.bar(srs, count)

# Add labels and title
plt.xlabel("Subreddits")
plt.ylabel("Numbers")
plt.title("Subreddits Redditor who have distress visits")
plt.xticks(rotation=-85)

# Add legend
plt.legend()

# Show the plot
plt.show()
```

```
C:\Users\haleel\AppData\Local\Temp\ipykernel_20448\3575300548.py:20: UserWarning: No artists with labels found to put in
  plt.legend()
```




```
# printing few most engaged subreddits of the focused community
mostvisitedsrs = list(sorted_srvisits.keys())
print(mostvisitedsrs[-50:])
```

```
['productivitycafe', 'socialskills', 'moviesuggestions', 'antiwork', 'ask', 'aww', 'worldnews', 'genz', 'meirl', 'interes
```