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
```

```
  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)
Requirement already satisfied: requests>=2.32.2 in /usr/local/lib/python3.11/dist-packages (from datasets) (2.32.3)
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
Requirement already satisfied: packaging in /usr/local/lib/python3.11/dist-packages (from datasets) (24.2)
Requirement already satisfied: pyyaml>=5.1 in /usr/local/lib/python3.11/dist-packages (from datasets) (6.0.2)
Requirement already satisfied: python-dateutil>=2.8.2 in /usr/local/lib/python3.11/dist-packages (from pandas->datasets
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.11/dist-packages (from pandas->datasets) (2025.1)
Requirement already satisfied: tzdata>=2022.7 in /usr/local/lib/python3.11/dist-packages (from pandas->datasets) (2025.
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests>=2.32
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.11/dist-packages (from requests>=2.32.2->datasets
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.11/dist-packages (from requests>=2.32.2->da
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.11/dist-packages (from requests>=2.32.2->dat
Requirement already satisfied: aiohappyeyeballs>=2.3.0 in /usr/local/lib/python3.11/dist-packages (from aiohttp->datase
Requirement already satisfied: aiosignal>=1.1.2 in /usr/local/lib/python3.11/dist-packages (from aiohttp->datasets) (1.
Requirement already satisfied: attrs>=17.3.0 in /usr/local/lib/python3.11/dist-packages (from aiohttp->datasets) (25.3.
Requirement already satisfied: frozenlist>=1.1.1 in /usr/local/lib/python3.11/dist-packages (from aiohttp->datasets) (1
Requirement already satisfied: multidict<7.0,>=4.5 in /usr/local/lib/python3.11/dist-packages (from aiohttp->datasets)
Requirement already satisfied: propcache>=0.2.0 in /usr/local/lib/python3.11/dist-packages (from aiohttp->datasets) (0.
Requirement already satisfied: yarl<2.0,>=1.17.0 in /usr/local/lib/python3.11/dist-packages (from aiohttp->datasets) (1
Requirement already satisfied: typing-extensions>=3.7.4.3 in /usr/local/lib/python3.11/dist-packages (from huggingface-
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.11/dist-packages (from python-dateutil>=2.8.2->pandas
Installing collected packages: dill, xxhash, multiprocess, fsspec, datasets
  Attempting uninstall: fsspec
    Found existing installation: fsspec 2025.3.0
    Uninstalling fsspec-2025.3.0:
      Successfully uninstalled fsspec-2025.3.0
ERROR: pip's legacy dependency resolver does not consider dependency conflicts when selecting packages. This behaviour
torch 2.6.0+cu124 requires nvidia-cublas-cu12==12.4.5.8; platform_system == "Linux" and platform_machine == "x86_64",
torch 2.6.0+cu124 requires nvidia-cuda-cupti-cu12==12.4.127; platform_system == "Linux" and platform_machine == "x86_6
torch 2.6.0+cu124 requires nvidia-cuda-nvrtc-cu12==12.4.127; platform_system == "Linux" and platform_machine == "x86_6
torch 2.6.0+cu124 requires nvidia-cuda-runtime-cu12==12.4.127; platform_system == "Linux" and platform_machine == "x86_
torch 2.6.0+cu124 requires nvidia-cudnn-cu12==9.1.0.70; platform_system == "Linux" and platform_machine == "x86_64", b
torch 2.6.0+cu124 requires nvidia-cufft-cu12==11.2.1.3; platform_system == "Linux" and platform_machine == "x86_64", bu
torch 2.6.0+cu124 requires nvidia-curand-cu12==10.3.5.147; platform_system == "Linux" and platform_machine == "x86_64"
torch 2.6.0+cu124 requires nvidia-cusolver-cu12==11.6.1.9; platform_system == "Linux" and platform_machine == "x86_64"
torch 2.6.0+cu124 requires nvidia-cusparse-cu12==12.3.1.170; platform_system == "Linux" and platform_machine == "x86_6
torch 2.6.0+cu124 requires nvidia-nvjitlink-cu12==12.4.127; platform_system == "Linux" and platform_machine == "x86_64
gcsfs 2025.3.0 requires fsspec==2025.3.0, but you'll have fsspec 2024.12.0 which is incompatible.
Successfully installed datasets-3.4.1 dill-0.3.8 fsspec-2024.12.0 multiprocess-0.70.16 xxhash-3.5.0
Requirement already satisfied: nltk in /usr/local/lib/python3.11/dist-packages (3.9.1)
Requirement already satisfied: click in /usr/local/lib/python3.11/dist-packages (from nltk) (8.1.8)
Requirement already satisfied: joblib in /usr/local/lib/python3.11/dist-packages (from nltk) (1.4.2)
Requirement already satisfied: regex>=2021.8.3 in /usr/local/lib/python3.11/dist-packages (from nltk) (2024.11.6)
Requirement already satisfied: tqdm in /usr/local/lib/python3.11/dist-packages (from nltk) (4.67.1)
```

```
# 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="miVRJzK13hSGydTzkVWnEQ",
    client_secret="7kb6-4aDPFD5XUqrwyWRMvFFcBC4yg",
    user_agent="Dry_Statistician1212",
    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):
  # 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.subr

# 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	im got late start life im independent dont	I'm 28m and I got a late start in life. I'm	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")
```

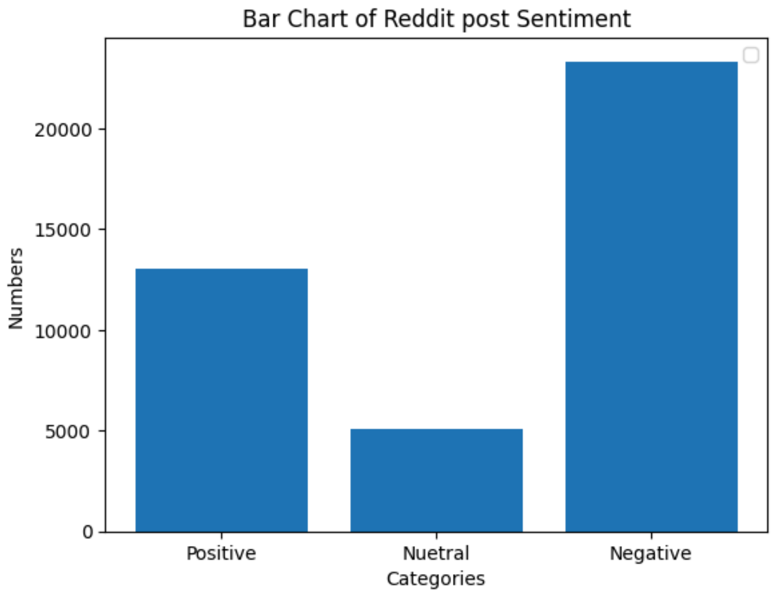
```
# Checking on posts retrieved
# result, it works good most of the time, but not great on lengthy posts
posts_1 = df['Content_row'].tolist()
for post in posts_1[2:12]:
  print(post," : ",get_sentiment(post))
  print('======')
```

```
t in chairs because my posture is only used to laying in bed. I enjoy eating in my bed. I feel safe in my bed.

t in chairs without being in pain. I don't know how to live like that anymore. It's been almost a decade since, I'm not

n things I could do with my life. I fantasize about how good I would have it if I had friends and didn't rot away in be

t so comforting to lay in bed because every other alternative is so strange and unfamiliar.

upposed to do when not in bed. I could do what I do in bed while sitting in a chair instead. But then my neck and back

just be in bed. I don't feel like I exist when no one sees me. My life is on standby. I can just rot because no one wil

njoy life outside of bed. I just don't understand how I'm supposed to. And everytime I try I end up feeling worse. I wa

s it so much worse than me. I have it easy compared to most. I have reached out for some help, but I don't think they u

an't get out of bed for mundane tasks. Because I show up to my appointments on time, clean and groomed.

nd "hanging out" the few times it happens. I understand having to be somewhere at a certain time. I understand eating w

ime I forget, and other times I tell myself I'll do it the next time I get out of bed, only to forget. I don't understa




llness. People like me who have never accomplished anything get blamed for our problems.

des. The same thing happens in adulthood with people who are less successful.

by working hard, or proven your worth through your accomplishments, then don’t expect to be met with understanding when


ute. Also I know for a fact that no one will give a shit what I feel after the child is here.

again.   :  Negative

. I started a band and we got really popular locally and now I'm making good money at gigs, and throwing insane partys.

. i want to stay this way even if it hurts me. the more i think about being depressed or getting better, the closer i a

gh to pay my share of the rent. I feel completely worthless bc as a man it feels like you’re either the “strong provide
```

```
n I'll be looking at memes or something will happen and "I will genuinely lose my shit". Like I will laugh so fucking h
myself and ghosted peers, friends, and family. Just recently, finally broke up with my partner and they were pretty much
n live in. Pack my stuff like I'm moving out. Prepped the letters and even goodie bags for my loved ones filled with my b
hasn't. It's only gotten worse and as each day passes, I'm more sure of this decision. I've imagined my plan in my head
I'm just scared to feel some sort of hope again and all the progress I've made to planning my death, will all be for no
d. Please don't be angry that I didn't come for help. I am already such a burden and there's bigger problems out there.
```

```
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 
  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]
```

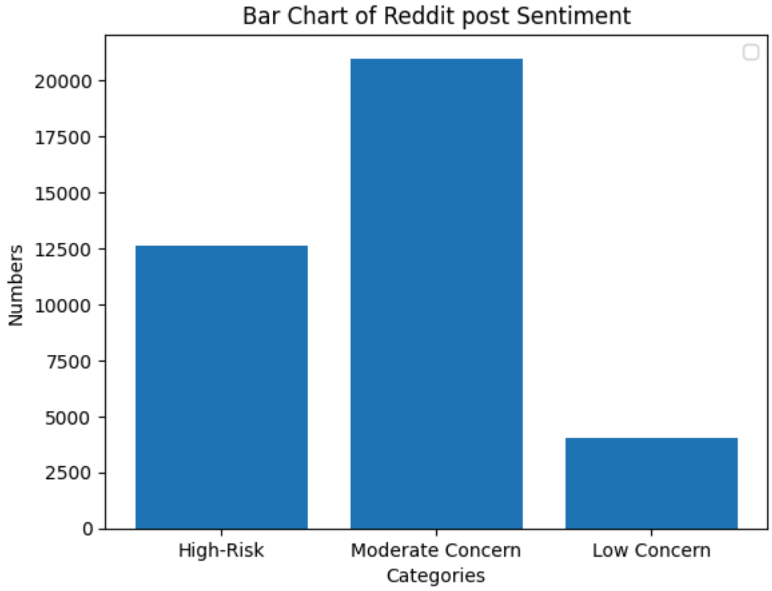
```
{'label': 'LABEL_0', 'score': 0.9984997510910034}
```

```
# 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
```

```
n things I could do with my life. I fantasize about how good I would have it if I had friends and didn't rot away in be

t so comforting to lay in bed because every other alternative is so strange and unfamiliar.

upposed to do when not in bed. I could do what I do in bed while sitting in a chair instead. But then my neck and back

just be in bed. I don't feel like I exist when no one sees me. My life is on standby. I can just rot because no one wil

njoy life outside of bed. I just don't understand how I'm supposed to. And everytime I try I end up feeling worse. I wa

s it so much worse than me. I have it easy compared to most. I have reached out for some help, but I don't think they u

an't get out of bed for mundane tasks. Because I show up to my appointments on time, clean and groomed.

nd "hanging out" the few times it happens. I understand having to be somewhere at a certain time. I understand eating w

ime I forget, and other times I tell myself I'll do it the next time I get out of bed, only to forget. I don't understa



llness. People like me who have never accomplished anything get blamed for our problems.

des. The same thing happens in adulthood with people who are less successful.

by working hard, or proven your worth through your accomplishments, then don’t expect to be met with understanding when



ute. Also I know for a fact that no one will give a shit what I feel after the child is here.

again.


. I started a band and we got really popular locally and now I'm making good money at gigs, and throwing insane partys.


. i want to stay this way even if it hurts me. the more i think about being depressed or getting better, the closer i a


gh to pay my share of the rent. I feel completely worthless bc as a man it feels like you’re either the “strong provide


 anything. I just don’t like being alive. I don’t want anything. There’s nothing I’m missing that, if provided, would m


n I'll be looking at memes or something will happen and *I will genuinely lose my shit*. Like i will laugh so fucking h
```

```
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}
```

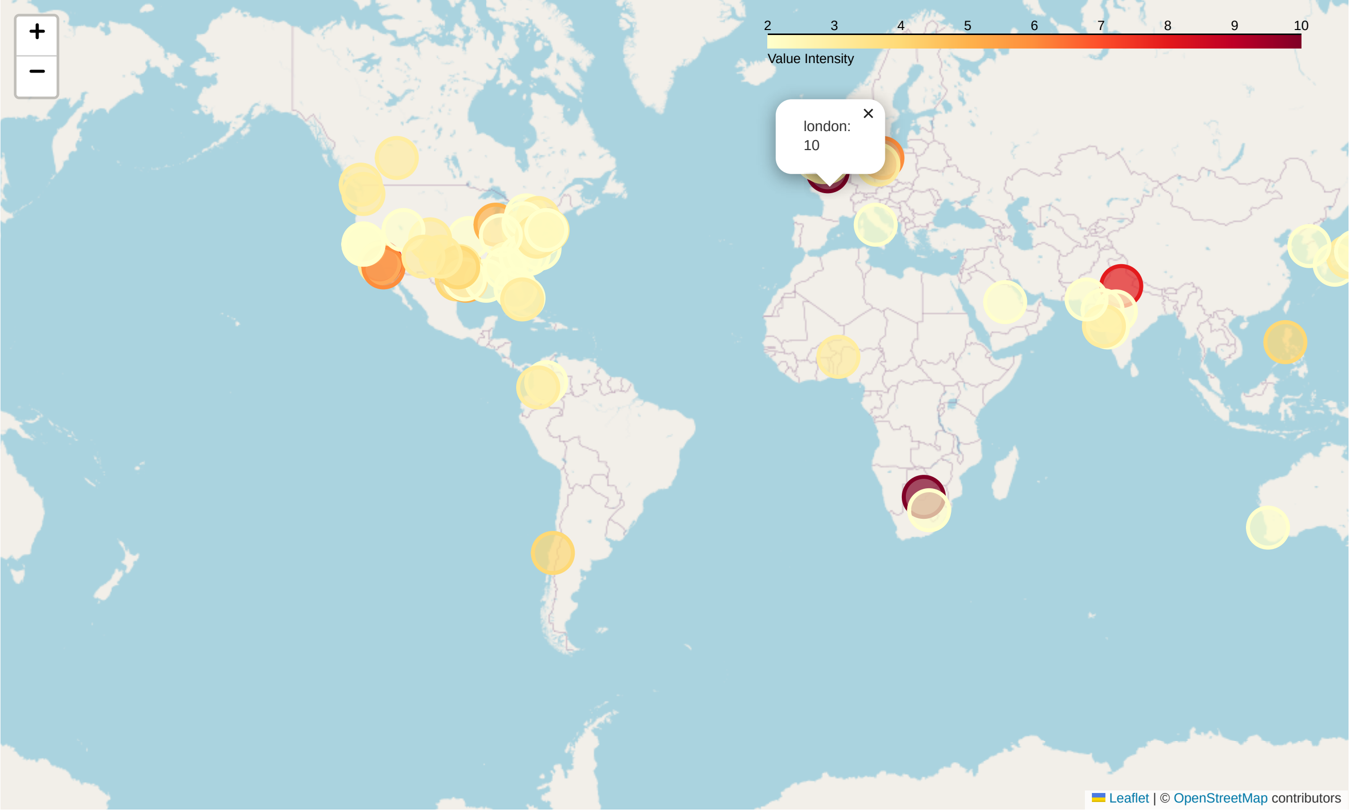
```
# Get the distribuition of location of Authors
# And count of Authors in each city.
city_count = {}

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 gradient.
# 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
```

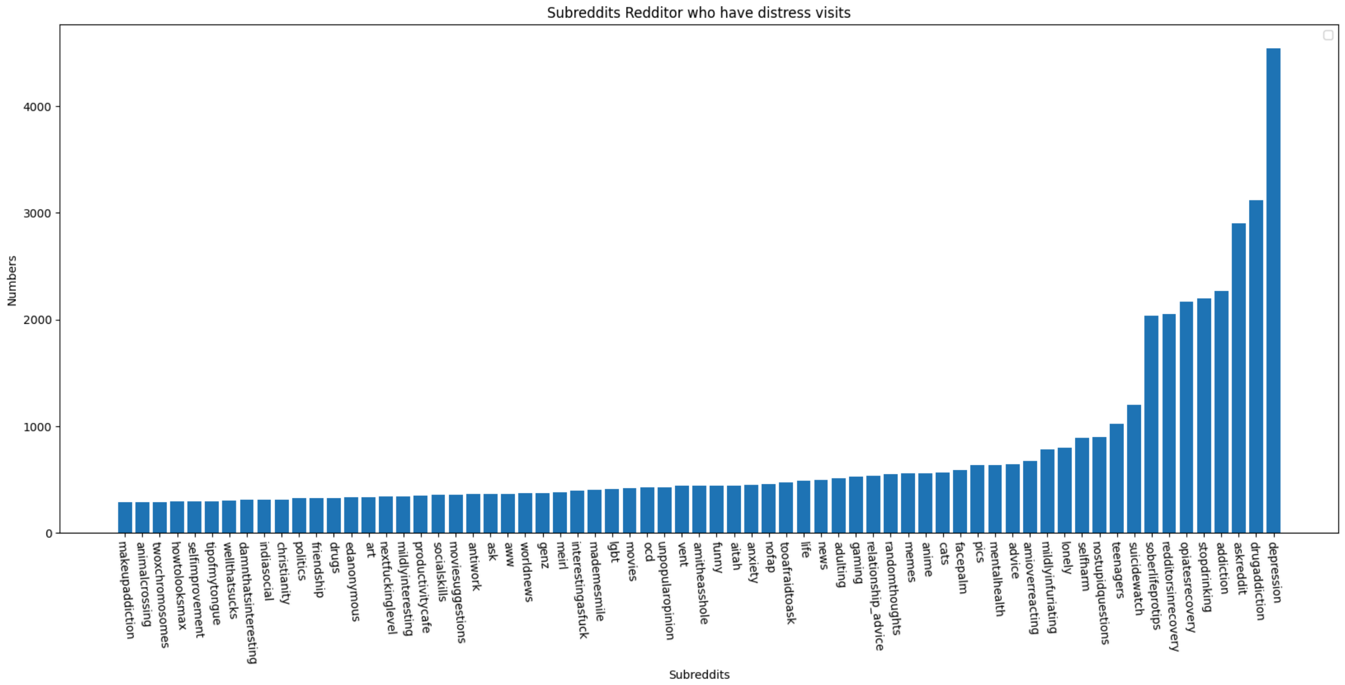


Some Extra work, trying to gain some more insights from this data

```
# 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()
```


Subreddits Redditor who have distress visits

```
# 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
```