```
import warnings
warnings.filterwarnings('ignore')
import numpy as np
import pandas as pd
from google.colab import drive
drive.mount('/content/drive')
    Mounted at /content/drive
import seaborn as sns
import matplotlib.pyplot as plt
import plotly.express as px
am1 = pd.read_csv("/content/drive/MyDrive/collab /prevalence-by-mental-and-substance-use-disorder.csv")
am1.head()
                                         Prevalence - Prevalence - Prevalence - Prevalence - Prevalence -
                             Prevalence -
                                              Bipolar
                                                           Eating
                                                                      Anxiety
                                                                                  Drug use
                                                                                            Depressive
                            Schizophrenia
                                           disorder -
                                                       disorders -
                                                                   disorders -
                                                                               disorders -
                                                                                            disorders -
                              Sex: Both -
          Entity Code Year
                                          Sex: Both -
                                                       Sex: Both -
                                                                   Sex: Both -
                                                                               Sex: Both -
                                                                                            Sex: Both -
                                Age: Age-
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     0 Afghanistan
                  AFG 1990
                                 0.228979
                                             0.721207
                                                          0.131001
                                                                      4.835127
                                                                                  0.454202
                                                                                               5.125291
                  AFG 1991
       Afghanistan
                                 0.228120
                                             0.719952
                                                          0.126395
                                                                      4.821765
                                                                                  0.447112
                                                                                               5.116306
```

0.718418

0.717452

0.717012

am2.head(10)

2 Afghanistan

3 Afghanistan

AFG

4 Afghanistan AFG 1994

AFG 1993

1992

0.227328

0.226468

0.225567

Entity Code Year DALYs (Disability-Adjusted Life Years) - Mental disorders - Sex: Both - Age: All Ages (Percent) 0 Afghanistan AFG 1990 1 696670 1 Afghanistan AFG 1991 1.734281 2 Afghanistan AFG 1992 1.791189 1.776779 3 Afghanistan AFG 1993 4 Afghanistan AFG 1994 1.712986 5 Afghanistan AFG 1995 1.738272 6 Afghanistan AFG 1996 1.778098 AFG 1997 1.781815 7 Afghanistan 8 Afghanistan AFG 1998 1.729402 1.850988 9 Afghanistan AFG 1999

0.121832

0.117942

0.114547

4.801434

4.789363

4 784923

0.441190

0.435581

0.431822

5.106558

5.100328

5 099424

data = pd.merge(am1,am2) data.head(10)

Alcohol use

disorders -

Sex: Both -

standardized

Age: Age-

(Percent)

0.444036

0.444250

0.445501

0.445958

0.445779

	Entity	Code	Year	Prevalence - Schizophrenia - Sex: Both - Age: Age- standardized (Percent)	Prevalence - Bipolar disorder - Sex: Both - Age: Age- standardized (Percent)	Prevalence - Eating disorders - Sex: Both - Age: Age- standardized (Percent)	Prevalence - Anxiety disorders - Sex: Both - Age: Age- standardized (Percent)	Prevalence - Drug use disorders - Sex: Both - Age: Age- standardized (Percent)	Prevalence - Depressive disorders - Sex: Both - Age: Age- standardized (Percent)	Prevalence - Alcohol use disorders - Sex: Both - Age: Age- standardized (Percent)
0	Afghanistan	AFG	1990	0.228979	0.721207	0.131001	4.835127	0.454202	5.125291	0.444036
1	Afghanistan	AFG	1991	0.228120	0.719952	0.126395	4.821765	0.447112	5.116306	0.444250
2	Afghanistan	AFG	1992	0.227328	0.718418	0.121832	4.801434	0.441190	5.106558	0.445501
3	Afghanistan	AFG	1993	0.226468	0.717452	0.117942	4.789363	0.435581	5.100328	0.445958
1	Δfahanietan	ΔFC	100/	N 225567	N 717N12	Λ 11 <i>1</i> 5/17	A 78AQ23	በ //31ደንን	5 000121	N 445770
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Cod									690	
			hrenia	- Sex: Both -	Age: Age-stand	dardized (Perc	ent)		0 0	
Yea	evalence - So	rnizon								
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data.drop('Code',axis=1,inplace=True)

data.head(10)

data.head(10)

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              8 Afghanistan 1998
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data.size,data.shape
             (68400, (6840, 10))
```

data.set\_axis(['Country', 'Year', 'Schizophrenia', 'Bipolar\_disorder', 'Eating\_disorder', 'Anxiety', 'drug\_usage', 'depression', 'alcohol', '

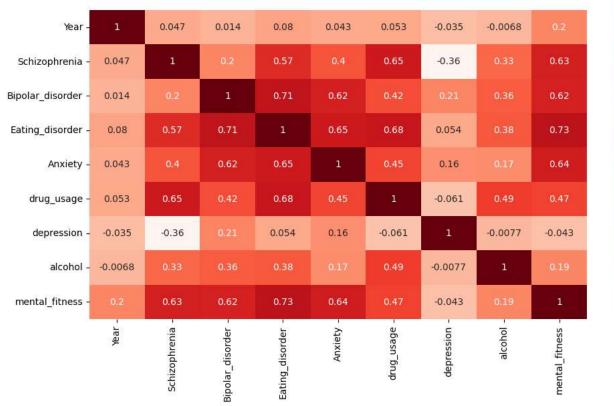
https://colab.research.google.com/drive/17uJ6So4Uzvj9RssGQmKECmw0RTh\_Wiie#scrollTo=gaUaTVuJCqEb&printMode=true

	Country	Year	Schizophrenia	Bipolar_disorder	Eating_disorder	Anxiety	drug_usage	depression	alcohol	mental_fit
0	Afghanistan	1990	0.228979	0.721207	0.131001	4.835127	0.454202	5.125291	0.444036	1.69
1	Afghanistan	1991	0.228120	0.719952	0.126395	4.821765	0.447112	5.116306	0.444250	1.73
2	Afghanistan	1992	0.227328	0.718418	0.121832	4.801434	0.441190	5.106558	0.445501	1.79
3	Afghanistan	1993	0.226468	0.717452	0.117942	4.789363	0.435581	5.100328	0.445958	1.77
4	Afghanistan	1994	0.225567	0.717012	0.114547	4.784923	0.431822	5.099424	0.445779	1.71
5	Afghanistan	1995	0.224713	0.716686	0.111129	4.780851	0.428578	5.098495	0.445422	1.73
6	Afghanistan	1996	0.223690	0.716388	0.107786	4.777272	0.426393	5.100580	0.444837	1.77
7	Afghanistan	1997	0.222424	0.716143	0.103931	4.775242	0.423720	5.105474	0.443938	1.78
8	Afghanistan	1998	0.221129	0.716139	0.100343	4.777377	0.422491	5.113707	0.442665	1.72

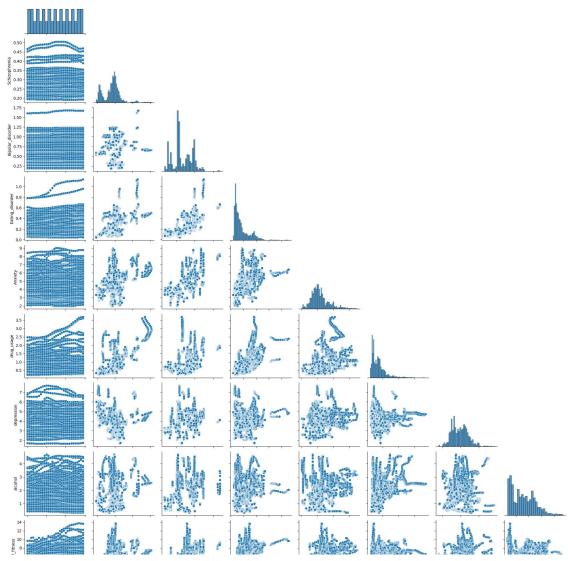
Double-click (or enter) to edit

plt.figure(figsize=(12,6))
sns.heatmap(data.corr(),annot=True,cmap='Reds')
plt.plot()

[]



sns.pairplot(data,corner=True)
plt.show()



mean = data['mental\_fitness'].mean()
mean

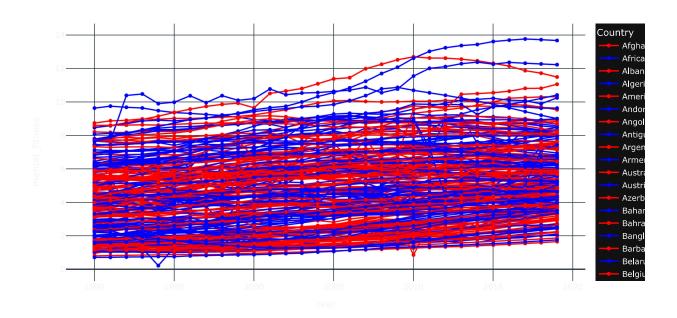
## 4.8180618117506135

fig = px.pie(data,values='mental\_fitness',names='Year')
fig.show()

₽



fig = px.line(data,x ="Year",y="mental\_fitness",color='Country',markers=True,color\_discrete\_sequence=['red','blue'],template='plotly\_dark')
fig.show()



```
df = data.copy()
data.info()
     <class 'pandas.core.frame.DataFrame'>
    Int64Index: 6840 entries, 0 to 6839
    Data columns (total 10 columns):
                           Non-Null Count Dtype
     #
         Column
         Country
                           6840 non-null
                                           object
                           6840 non-null
                                           int64
     1
         Year
     2
         Schizophrenia
                            6840 non-null
                                            float64
         Bipolar_disorder 6840 non-null
                                           float64
         Eating_disorder
                           6840 non-null
                                           float64
                                           float64
     5
         Anxiety
                            6840 non-null
         drug_usage
                            6840 non-null
                                           float64
         depression
                           6840 non-null
                                           float64
         alcohol
     8
                           6840 non-null
                                           float64
         mental_fitness
                           6840 non-null
                                           float64
     dtypes: float64(8), int64(1), object(1)
    memory usage: 587.8+ KB
from sklearn.preprocessing import LabelEncoder
l=LabelEncoder()
for i in df.columns:
   if df[i].dtype == 'object':
       df[i]=1.fit_transform(df[i])
df.shape
     (6840, 10)
x = df.drop('mental_fitness',axis=1)
y = df['mental_fitness']
```

from sklearn.model\_selection import train\_test\_split
xtrain, xtest,ytrain,ytest = train\_test\_split(x,y, test\_size=.20,random\_state=2)

df.head()

```
Country Year Schizophrenia Bipolar_disorder Eating_disorder Anxiety drug_usage depression alcohol mental_fit
0 Afghanistan 1990
                         0.228979
                                            0.721207
                                                             0.131001 4.835127
                                                                                  0.454202
                                                                                              5.125291 0.444036
                                                                                                                        1.69
                         0.228120
                                            0.719952
                                                             0.126395 4.821765
                                                                                  0.447112
                                                                                               5.116306 0.444250
1 Afghanistan 1991
                                                                                                                        1.73
2 Afghanistan
              1992
                         0.227328
                                            0.718418
                                                             0.121832 4.801434
                                                                                  0.441190
                                                                                              5.106558 0.445501
                                                                                                                        1.79
3 Afghanistan 1993
                         0.226468
                                            0.717452
                                                             0.117942 4.789363
                                                                                  0.435581
                                                                                              5.100328 0.445958
                                                                                                                        1.77
                                                                                  0.431822
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                                                                                                                        1.71
```

```
4 Afghanistan 1994
                               0.225567
                                                0.717012
                                                                 0.114547 4.784923
print("xtrain: ",xtrain.shape)
print("xtest: ",xtest.shape)
print("\n ytrain: ",ytrain.shape)
print("ytest: ",ytest.shape)
     xtrain: (5472, 9)
    xtest: (1368, 9)
     ytrain: (5472,)
     ytest: (1368,)
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean_squared_error,r2_score
lr = LinearRegression()
lr.fit(xtrain,ytrain)
ytrain_pred = lr.predict(xtrain)
mse = mean_squared_error(ytrain,ytrain_pred)
rmse =(np.sqrt(mean_squared_error(ytrain,ytrain_pred)))
r2 = r2_score(ytrain,ytrain_pred)
print("The Linear Regression model performance for training set")
print('MSE is{}'.format(mse))
print('RMSE is{}'.format(rmse))
print('R2 score is{}'.format(r2))
    The Linear Regression model performance for training set
    MSE is1.389959372405798
    RMSE is1.1789653821914357
    R2 score is0.7413245790025275
from sklearn.ensemble import RandomForestRegressor
from sklearn.metrics import mean_squared_error, r2_score
# Create an instance of the RandomForestRegressor
rf = RandomForestRegressor()
# Fit the model to the training data
rf.fit(xtrain, ytrain)
# Make predictions on the training data
ytrain_pred = rf.predict(xtrain)
# Calculate the evaluation metrics
mse = mean_squared_error(ytrain, ytrain_pred)
rmse = np.sqrt(mse)
r2 = r2 score(ytrain, ytrain pred)
# Print the performance metrics
print("The Random Forest Regressor model performance for the training set")
print("----")
print('MSE is {}'.format(mse))
print('RMSE is {}'.format(rmse))
print('R2 score is {}'.format(r2))
```

```
The Random Forest Regressor model performance for the training set
     MSE is 0.004922871041127231
     RMSE is 0.07016317439460126
     R2 score is 0.999083839596782
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean squared error, r2 score
# Linear Regression model instantiation
lr = LinearRegression()
# Fit the model to the training data
lr.fit(xtrain, ytrain)
# Linear Regression model evaluation
ytest_pred = lr.predict(xtest)
mse = mean_squared_error(ytest, ytest_pred)
rmse = np.sqrt(mse)
r2 = r2_score(ytest, ytest_pred)
print("The Linear Regression model performance for the testing set")
print("-----")
print('MSE is {}'.format(mse))
print('RMSE is {}'.format(rmse))
print('R2 score is {}'.format(r2))
# Random Forest Regressor model evaluation
ytest_pred = rf.predict(xtest)
mse = mean_squared_error(ytest, ytest_pred)
rmse = np.sqrt(mse)
r2 = r2_score(ytest, ytest_pred)
\label{lem:print("\n\nThe Random Forest Regressor model performance for the testing set")} \\
print('MSE is {}'.format(mse))
print('RMSE is {}'.format(rmse))
print('R2 score is {}'.format(r2))
     The Linear Regression model performance for the testing set
     MSE is 1.1357545319272384
     RMSE is 1.0657178481789813
     R2 score is 0.7638974087055272
     The Random Forest Regressor model performance for the testing set
     MSE is 0.029894060286320644
     RMSE is 0.17289898867928824
     R2 score is 0.993785571706294
```

Os completed at 10:06 AM