In [1]:

```
# This Code Does an Import of a CSV file an alternative may be an excel file
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from scipy import stats
from sklearn.preprocessing import StandardScaler
pd.options.mode.chained_assignment = None

import warnings
warnings.filterwarnings('ignore')


#Phase 1 collecting the data
pd.set_option("expand_frame_repr", False) #Avoids Printing on the next line
df= pd.read_csv('C:/Users/Marc/Dropbox/University of Pretoria/791/Cheat Shee
df.columns =["Timestamp","Gender", "Age", "Course", "Year", "CGPA", "Status"
df
```

Out[1]:

	Timestamp	Gender	Age	Course	Year	CGPA	Status	Depression
0	8/7/2020 12:02	Female	18.0	Engineering	year 1	3.00 - 3.49	No	Yes
1	8/7/2020 12:04	Male	21.0	Islamic education	year 2	3.00 - 3.49	No	No
2	8/7/2020 12:05	Male	19.0	BIT	Year 1	3.00 - 3.49	No	Yes
3	8/7/2020 12:06	Female	22.0	Laws	year 3	3.00 - 3.49	Yes	Yes
4	8/7/2020 12:13	Male	23.0	Mathemathics	year 4	3.00 - 3.49	No	No
...	...	...	...	...	...	...	...	...
96	13/07/2020 19:56:49	Female	21.0	BCS	year 1	3.50 - 4.00	No	No
97	13/07/2020 21:21:42	Male	18.0	Engineering	Year 2	3.00 - 3.49	No	Yes
98	13/07/2020 21:22:56	Female	19.0	Nursing	Year 3	3.50 - 4.00	Yes	Yes
99	13/07/2020 21:23:57	Female	23.0	Pendidikan Islam	year 4	3.50 - 4.00	No	No
100	18/07/2020 20:16:21	Male	20.0	Biomedical science	Year 2	3.00 - 3.49	No	No

101 rows × 11 columns

In [2]:

```
#Can we actually determine the type of species based on the bill length, bil
from sklearn.ensemble import RandomForestClassifier
from sklearn.svm import LinearSVC
from sklearn.naive_bayes import GaussianNB
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import LabelEncoder
from sklearn.ensemble import StackingClassifier #ensmbl method of stacking c
from sklearn.metrics import accuracy_score, precision_score, recall_score, f
from sklearn.metrics import confusion_matrix
from sklearn.metrics import classification_report


from sklearn.tree import DecisionTreeClassifier   #estimator in GA
import numpy as np

import warnings
warnings.filterwarnings('ignore')
```

In [3]:

```
# Convert levels to numeric
feature_encoder= LabelEncoder()
df['Timestamp'] = feature_encoder.fit_transform(df['Timestamp'])
df['Gender'] = feature_encoder.fit_transform(df['Gender'])
df['Status'] = feature_encoder.fit_transform(df['Status'])
df['Depression'] = feature_encoder.fit_transform(df['Depression'])
df['Anxiety'] = feature_encoder.fit_transform(df['Anxiety'])
df['Panic'] = feature_encoder.fit_transform(df['Panic'])
df['Treatment'] = feature_encoder.fit_transform(df['Treatment'])
```

In [4]:

```
df.head(10)
```

Out[4]:

	Timestamp	Gender	Age	Course	Year	CGPA	Status	Depression	A
0	23	0	18.0	Engineering	year 1	3.00 - 3.49	0	1	
1	24	1	21.0	Islamic education	year 2	3.00 - 3.49	0	0	
2	25	1	19.0	BIT	Year 1	3.00 - 3.49	0	1	
3	26	0	22.0	Laws	year 3	3.00 - 3.49	1	1	
4	27	1	23.0	Mathemathics	year 4	3.00 - 3.49	0	0	
5	28	1	19.0	Engineering	Year 2	3.50 - 4.00	0	0	
6	29	0	23.0	Pendidikan islam	year 2	3.50 - 4.00	1	1	
7	30	0	18.0	BCS	year 1	3.50 - 4.00	0	0	
8	31	0	19.0	Human Resources	Year 2	2.50 - 2.99	0	0	
9	32	1	18.0	Irkhs	year 1	3.50 - 4.00	0	0	

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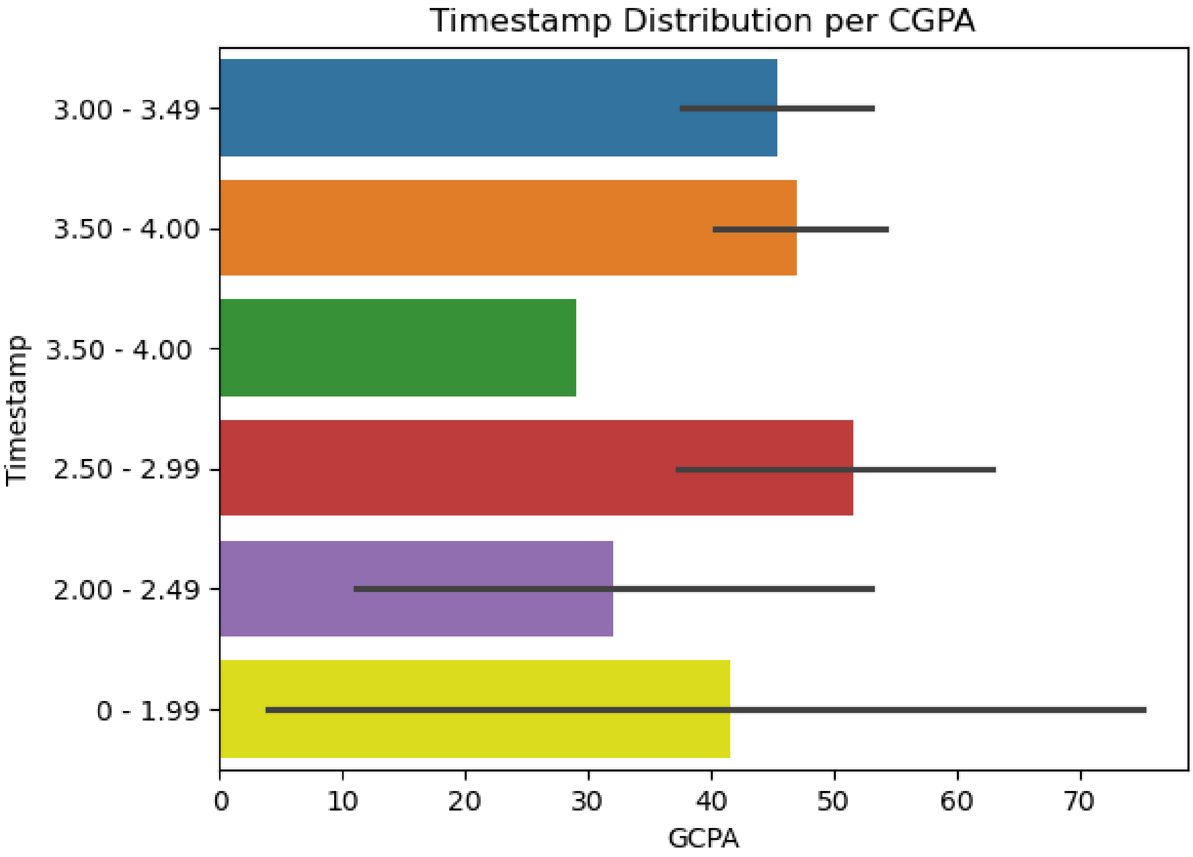
In [5]:

```
colors = ["#1f77b4", "#ff7f0e", "#2ca02c", "#d62728", "#9467bd", "#FFFF00"]
sns.barplot(y = "CGPA", x="Timestamp", data = df, palette=colors)
plt.title("Timestamp Distribution per CGPA")
plt.ylabel("Timestamp")
plt.xlabel("GCPA")
```

Out[5]:

```
Text(0.5, 0, 'GCPA')
```



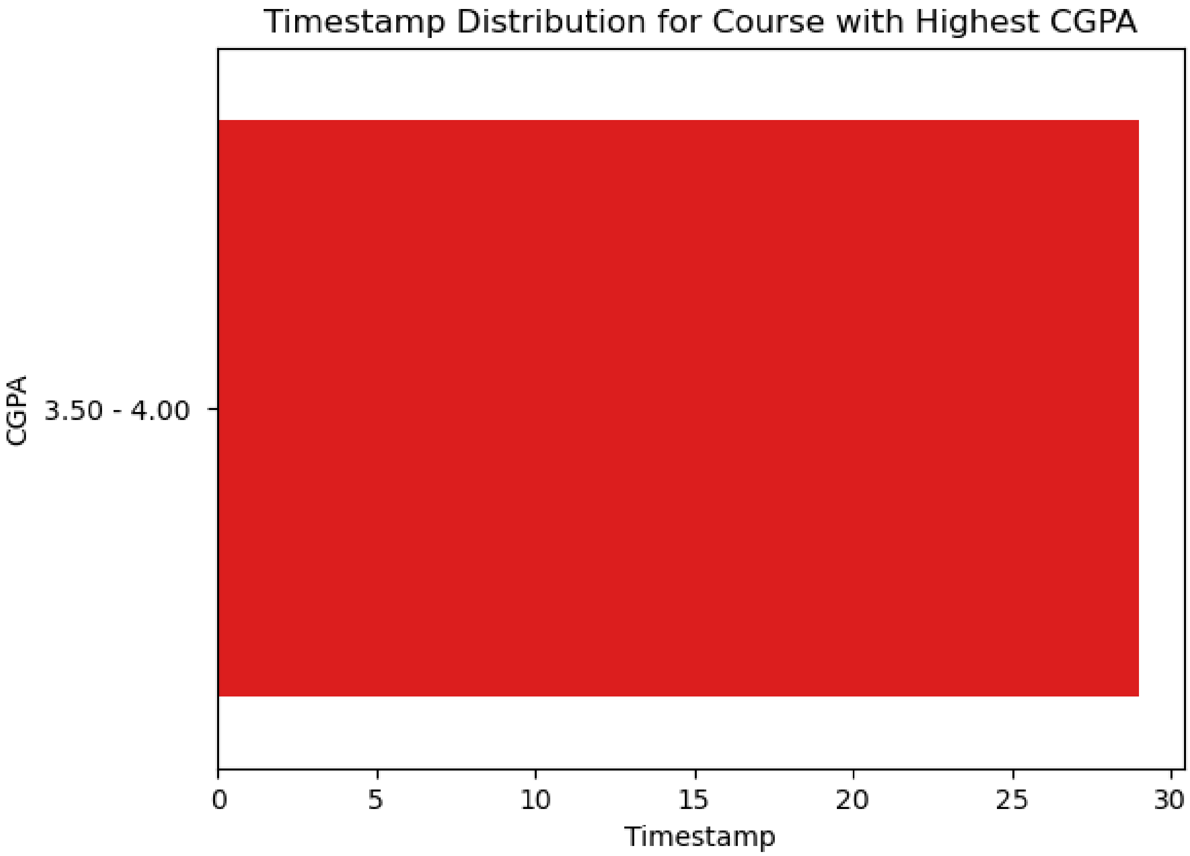
In [6]:

```
import seaborn as sns
import matplotlib.pyplot as plt

max_cgpa = df["CGPA"].max()

df_max_cgpa = df[df["CGPA"] == max_cgpa]

sns.barplot(y="CGPA", x="Timestamp", data=df_max_cgpa, color="red")
plt.title("Timestamp Distribution for Course with Highest CGPA")
plt.ylabel("CGPA")
plt.xlabel("Timestamp")
plt.show()
```



In [7]:
```
# Group the data by 'Course' and calculate the sum of 'Depression'
course_depression_counts = df.groupby('Course')['Depression'].sum()

# Find the course with the most depressed students
most_depressed_course = course_depression_counts.idxmax()
most_depressed_students = course_depression_counts.max()

print(f"The course with the most depressed students is '{most_depressed_cour
```

```
The course with the most depressed students is 'Engineering' with 7 depresse
d students.
```

In [22]:
```
# Group the data by 'Course' and calculate the sum of 'Depression'
course_depression_counts = df.groupby('Course')['Depression'].sum()

# Find the course with the most depressed students
most_depressed_course = course_depression_counts.idxmax()

# Filter the DataFrame to include only the students in the most depressed co
most_depressed_students_df = df[df['Course'] == most_depressed_course]

# Group the filtered data by 'Gender' and calculate the sum of 'Depression'
gender_depression_counts = most_depressed_students_df.groupby('Gender')['Dep

# Find the gender with the most depressed students
most_depressed_gender = gender_depression_counts.idxmax()

# Output the result
print(f"The most depressed gender among students in the '{most_depressed_cou
```

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```
The most depressed gender among students in the 'Engineering' course is '0'.
```

In [24]:

```python
# Filter the DataFrame to include only students who want treatment (Treatmer
students_wanting_treatment = df[df['Treatment'] == 1]

# Group the filtered data by 'Course' and 'Gender' and calculate the count c
treatment_counts = students_wanting_treatment.groupby(['Course', 'Gender']).

# Find the course and gender with the most students wanting treatment
most_wanted_course_gender = treatment_counts[treatment_counts['Count'] == tr

most_wanted_course = most_wanted_course_gender['Course'].values[0]
most_wanted_gender = most_wanted_course_gender['Gender'].values[0]

print(f"The course and gender that need the most treatment are '{most_wantec
```

```
The course and gender that need the most treatment are 'ALA' and'0'.
```

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