In [4]:
```
import pandas as pd
df=pd.read_csv('UniversityRanking_2022.csv')
df
```

Out[4]:

	Institute Id	Institute Name	City	State	Score	Rank	TLR	RPC	GO	OI	Perception
0	IR-O-U-0220	Indian Institute of Science	Bengaluru	Karnataka	82.67	1	79.13	91.48	78.23	58.39	100.00
1	IR-O-U-0109	Jawaharlal Nehru University	New Delhi	Delhi	67.99	2	71.19	44.96	95.07	73.36	67.88
2	IR-O-U-0500	Banaras Hindu University	Varanasi	Uttar Pradesh	64.02	3	64.50	45.00	100.00	53.13	58.57
3	IR-O-U-0570	Calcutta University	Kolkata	West Bengal	62.06	4	66.20	43.92	91.72	60.98	45.77
4	IR-O-U-0436	Amrita Vishwa Vidyapeetham	Coimbatore	Tamil Nadu	61.23	5	64.23	54.33	71.35	65.54	48.36
...	...	...	...	...	...	...	...	...	...	...	...
96	IR-O-U-0121	Goa University	Goa	Goa	38.96	96	48.86	15.05	60.91	55.96	20.01
97	IR-O-U-0043	Vignan's Foundation for Science, Technology an...	Guntur	Andhra Pradesh	38.92	97	49.40	15.25	60.65	56.03	18.00
98	IR-O-U-0555	Graphic Era University	Dehradun	Uttarakhand	38.91	98	47.99	9.74	60.76	62.23	32.17
99	IR-O-U-0223	Jain university, Bangalore	Bengluru	Karnataka	38.89	99	39.29	12.72	73.89	59.54	25.52
100	IR-O-U-0564	University of Petroleum and Energy Studies	Dehradun	Uttarakhand	38.88	100	46.46	15.08	60.13	61.98	21.90

101 rows × 11 columns

In [3]:
```
df.shape
```

Out[3]:
```
(101, 11)
```

In [5]:
```
df.isnull().sum()
```

Out[5]:
```
Institute Id      0
Institute Name    0
City              0
State             0
Score             0
Rank              0
TLR               0
RPC               0
GO                0
OI                0
Perception        0
dtype: int64
```

In [6]:
```
df.isnull().sum().sum()
```

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```
Out[6]: 0
```

```
In [76]: #importing libraries
import pandas as pd
import numpy as nm
import matplotlib.pyplot as mtp

#importing dataset
dataset=pd.read_csv('UniversityRanking_2022.csv')

#extracting independent and dependent variables
x=dataset.iloc[:,[8,4]].values
y=dataset.iloc[:,5].values

#splitting the dataset into training and test set
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.25,random_state=0)

#feature scaling
from sklearn.preprocessing import StandardScaler
st_x=StandardScaler()
x_train=st_x.fit_transform(x_train)
x_test=st_x.transform(x_test)
```

filling the random forest algorithm to training set

```
In [77]: #filling desicion tree classifier to the training set
from sklearn.ensemble import RandomForestClassifier
classifier=RandomForestClassifier(n_estimators=5,criterion="entropy")
classifier.fit(x_train,y_train)
```

```
Out[77]: ▼ RandomForestClassifier
RandomForestClassifier(criterion='entropy', n_estimators=5)
```

predecting the test set result

```
In [78]: #predicting the test set result
y_pred=classifier.predict(x_test)
```

creating the confustion matrix

```
In [79]: #creating a confusion matrix
from sklearn.metrics import confusion_matrix
cm=confusion_matrix(y_test,y_pred)
```

visulaizing the training set result

```
In [81]: from matplotlib.colors import ListedColormap
x_set,y_set=x_train,y_train
x1,x2=nm.meshgrid(nm.arange(start=x_set[:,0].min()-1,stop=x_set[:,0].max()+1,step=0.01),
                  nm.arange(start=x_set[:,1].min()-1,stop=x_set[:,1].max()+1,step=0.01))
mtp.contourf(x1,x2,classifier.predict(nm.array([x1.ravel(),x2.ravel()]).T).reshape(x1.sh
                                       alpha=0.75,cmap=ListedColormap(('purple','orange'))
mtp.xlim(x1.min(),x1.max())
```

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mtp.ylim(x2.min(),x2.max())
for i,j in enumerate(nm.unique(y_set)):
    mtp.scatter(x_set[y_set==j,0],x_set[y_set==j,1],c=ListedColormap(('blue','black'))(i
mtp.title('Random Forest Algorithm(training set)')
mtp.xlabel('GO')
mtp.ylabel('Rank')
mtp.legend()
mtp.show()
```

```
C:\Users\R.MUNIRANJANI\AppData\Local\Temp\ipykernel_23140\1671820996.py:10: UserWarning:
*c* argument looks like a single numeric RGB or RGBA sequence, which should be avoided a
s value-mapping will have precedence in case its length matches with *x* & *y*.  Please
use the *color* keyword-argument or provide a 2D array with a single row if you intend t
o specify the same RGB or RGBA value for all points.
  mtp.scatter(x_set[y_set==j,0],x_set[y_set==j,1],c=ListedColormap(('blue','black'))(i),
label=j)
```

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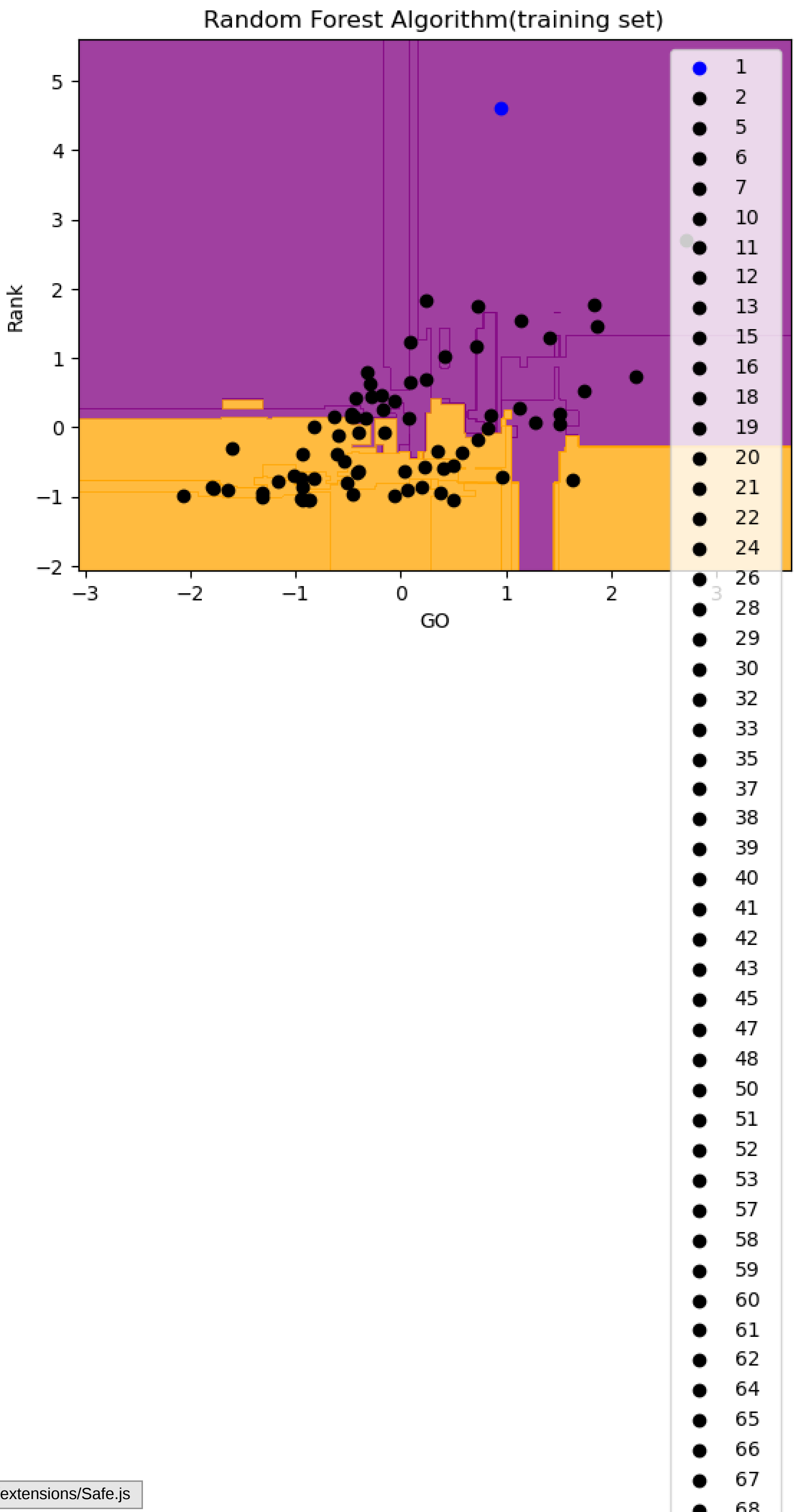

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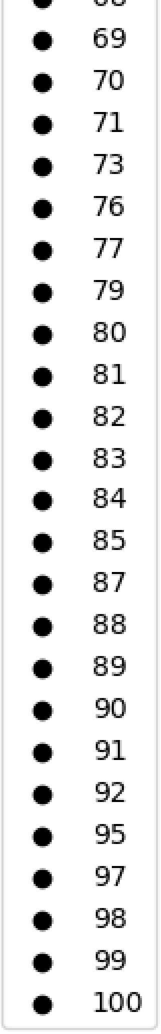

In [82]:
```
from matplotlib.colors import ListedColormap
x_set,y_set=x_test,y_test
x1,x2=nm.meshgrid(nm.arange(start=x_set[:,0].min()-1,stop=x_set[:,0].max()+1,step=0.01),
                  nm.arange(start=x_set[:,1].min()-1,stop=x_set[:,1].max()+1,step=0.01))
mtp.contourf(x1,x2,classifier.predict(nm.array([x1.ravel(),x2.ravel()]).T).reshape(x1.sh
                                      alpha=0.75,cmap=ListedColormap(('purple','orange'))
mtp.xlim(x1.min(),x1.max())
mtp.ylim(x2.min(),x2.max())
for i,j in enumerate(nm.unique(y_set)):
    mtp.scatter(x_set[y_set==j,0],x_set[y_set==j,1],c=ListedColormap(('blue','black'))(i
mtp.title('Random Forest Algorithm(testing set)')
mtp.xlabel('GO')
mtp.ylabel('Rank')
mtp.legend()
mtp.show()
```

```
C:\Users\R.MUNIRANJANI\AppData\Local\Temp\ipykernel_23140\2265926231.py:10: UserWarning:
*c* argument looks like a single numeric RGB or RGBA sequence, which should be avoided a
s value-mapping will have precedence in case its length matches with *x* & *y*.  Please
use the *color* keyword-argument or provide a 2D array with a single row if you intend t
o specify the same RGB or RGBA value for all points.
  mtp.scatter(x_set[y_set==j,0],x_set[y_set==j,1],c=ListedColormap(('blue','black'))(i),
label=j)
```

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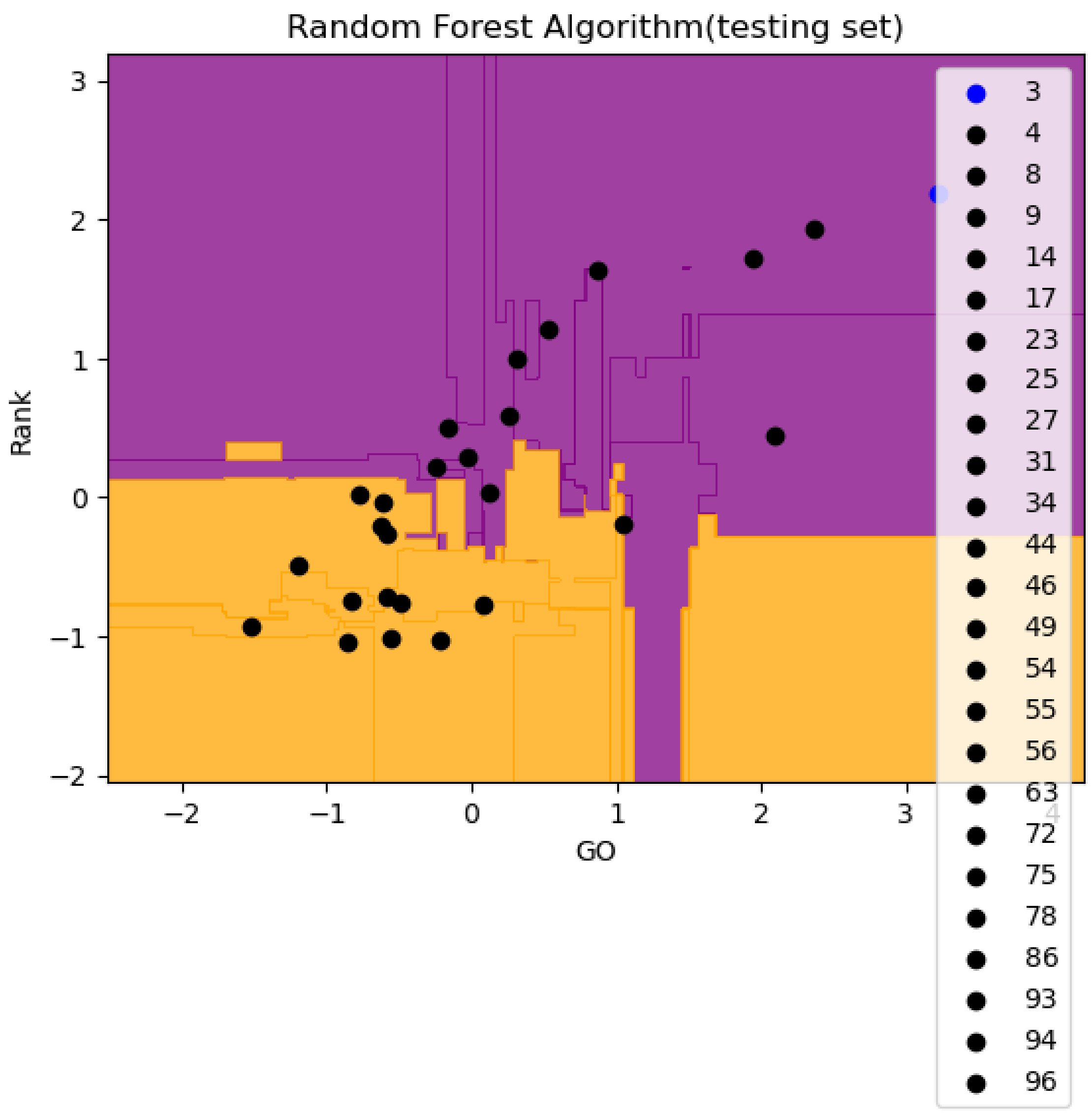

```
In [ ]:
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