Model to calculate if a student can get admission to BIT at 10th, 12th and JEE marks.

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In [1]:

```
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
```

In [2]:

```
data=pd.read_csv("C:\\Users\\shash\\Desktop\\SCP\\BITAdmission.csv")
data.head()
```

Out[2]:

	TENTH	TWELFTH	JEE	Decision
0	8.400	8.785	9.50	YES
1	9.870	8.857	9.60	YES
2	9.822	8.475	9.79	YES
3	9.129	7.682	9.99	YES
4	9.369	8.698	9.98	YES

In [3]:

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 59 entries, 0 to 58
Data columns (total 4 columns):
 #   Column    Non-Null Count  Dtype  
---  ------    --------------  -----  
 0   TENTH     59 non-null     float64
 1   TWELFTH   59 non-null     float64
 2   JEE       59 non-null     float64
 3   Decision  59 non-null     object 
dtypes: float64(3), object(1)
memory usage: 2.0+ KB
```

In [4]:

```
data.describe()
```

Out[4]:

	TENTH	TWELFTH	JEE
count	59.000000	59.000000	59.000000
mean	8.360051	7.831271	9.237458
std	0.776500	0.982750	0.585843
min	7.000000	3.658000	8.150000
25%	7.656000	7.472500	8.590000
50%	8.400000	7.857000	9.460000

	TENTH	TWELFTH	JEE
75%	8.739000	8.412500	9.705000
max	9.995000	9.658000	10.000000

In [5]:

```
data["Decision"].unique()
```

Out[5]:

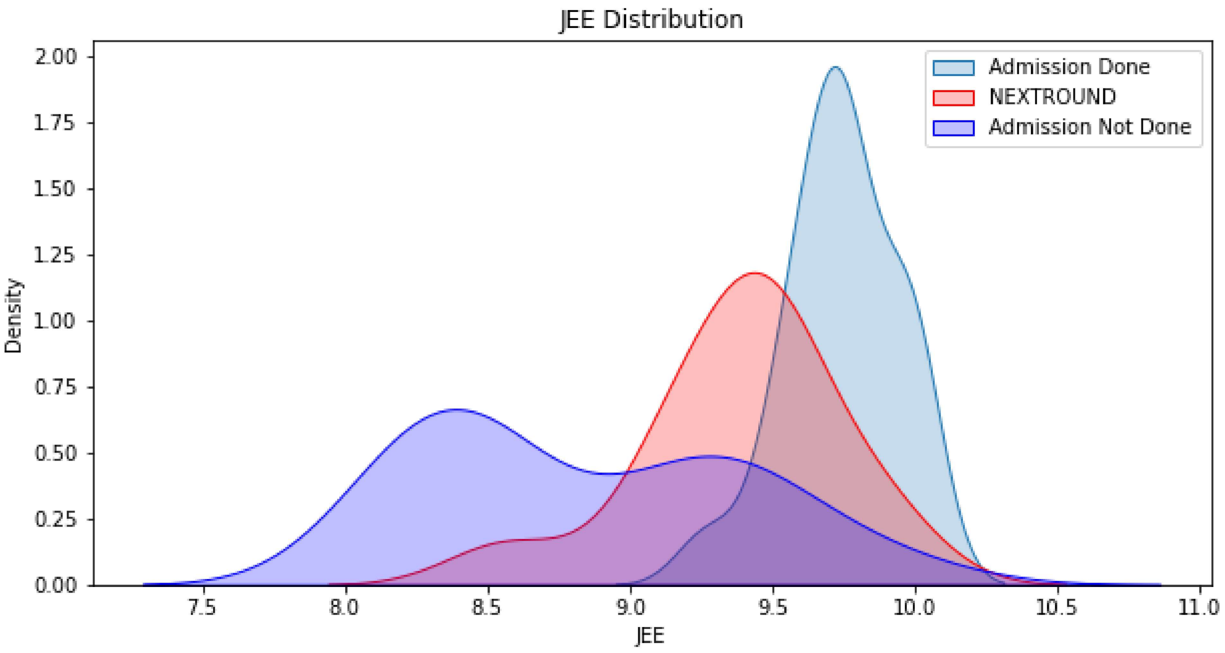
```
array(['YES', 'NO', 'NEXTROUND'], dtype=object)
```

In [6]:

```
plt.figure(figsize=(10,5))
sns.kdeplot(data=data[data["Decision"]=="YES"],x="JEE",shade=True,label="Admission Done
sns.kdeplot(data=data[data["Decision"]=="NEXTROUND"],x="JEE",shade=True,color="red",lab
sns.kdeplot(data=data[data["Decision"]=="NO"],x="JEE",color="blue",shade=True,label="Ad
plt.title("JEE Distribution")
plt.legend()
```

Out[6]:

```
<matplotlib.legend.Legend at 0x16a8ff99ac0>
```

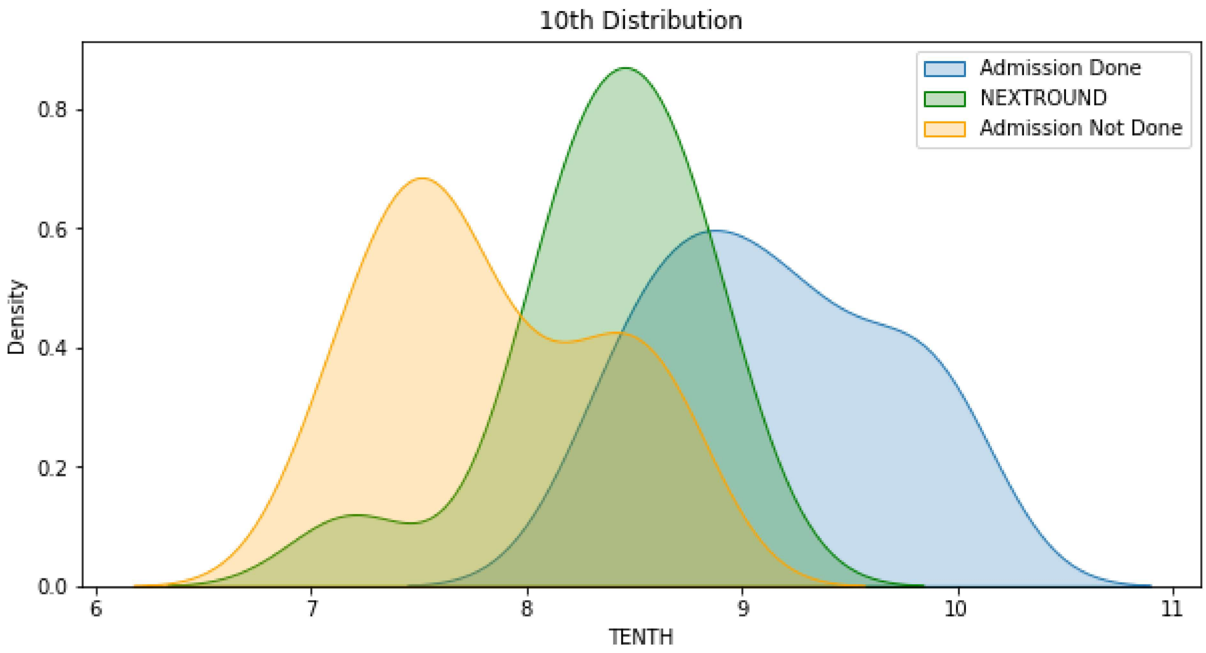


In [7]:

```
plt.figure(figsize=(10,5))
sns.kdeplot(data=data[data["Decision"]=="YES"],x="TENTH",shade=True,label="Admission Do
sns.kdeplot(data=data[data["Decision"]=="NEXTROUND"],x="TENTH",shade=True,color="green"
sns.kdeplot(data=data[data["Decision"]=="NO"],x="TENTH",color="orange",shade=True,label
plt.title("10th Distribution")
plt.legend()
```

Out[7]:

```
<matplotlib.legend.Legend at 0x16a91222c70>
```

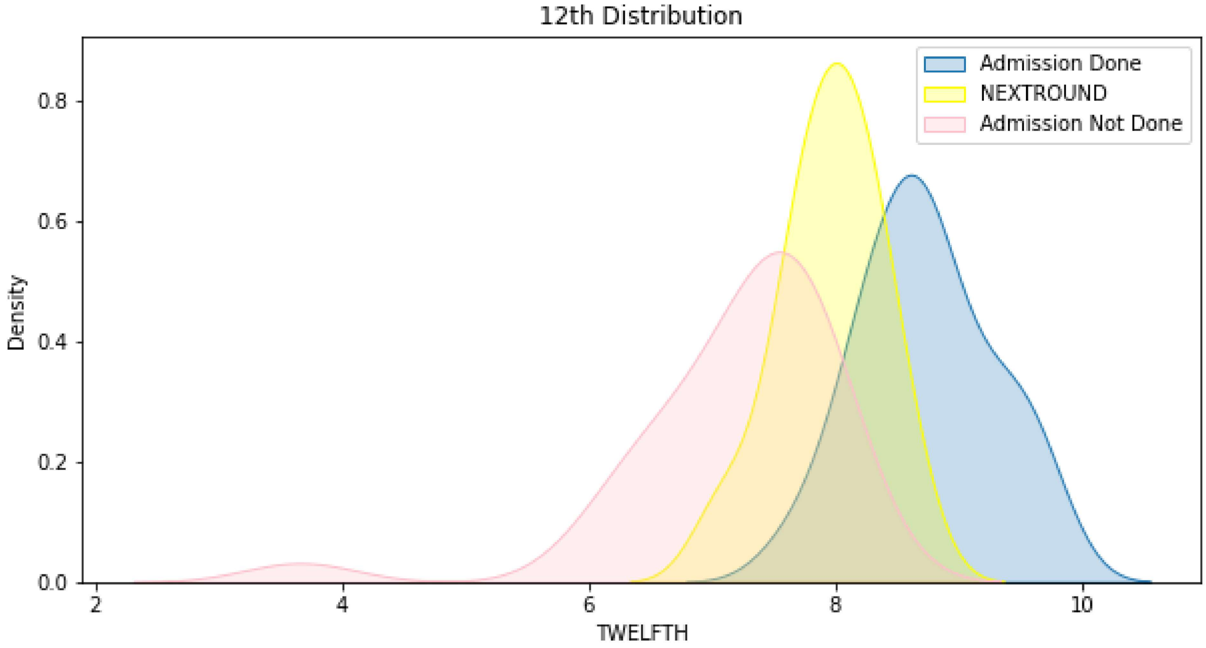


In [8]:

```
plt.figure(figsize=(10,5))
sns.kdeplot(data=data[data["Decision"]=="YES"],x="TWELFTH",shade=True,label="Admission
sns.kdeplot(data=data[data["Decision"]=="NEXTROUND"],x="TWELFTH",shade=True,color="yell
sns.kdeplot(data=data[data["Decision"]=="NO"],x="TWELFTH",color="pink",shade=True,label
plt.title("12th Distribution")
plt.legend()
```

Out[8]:

```
<matplotlib.legend.Legend at 0x16a912988e0>
```

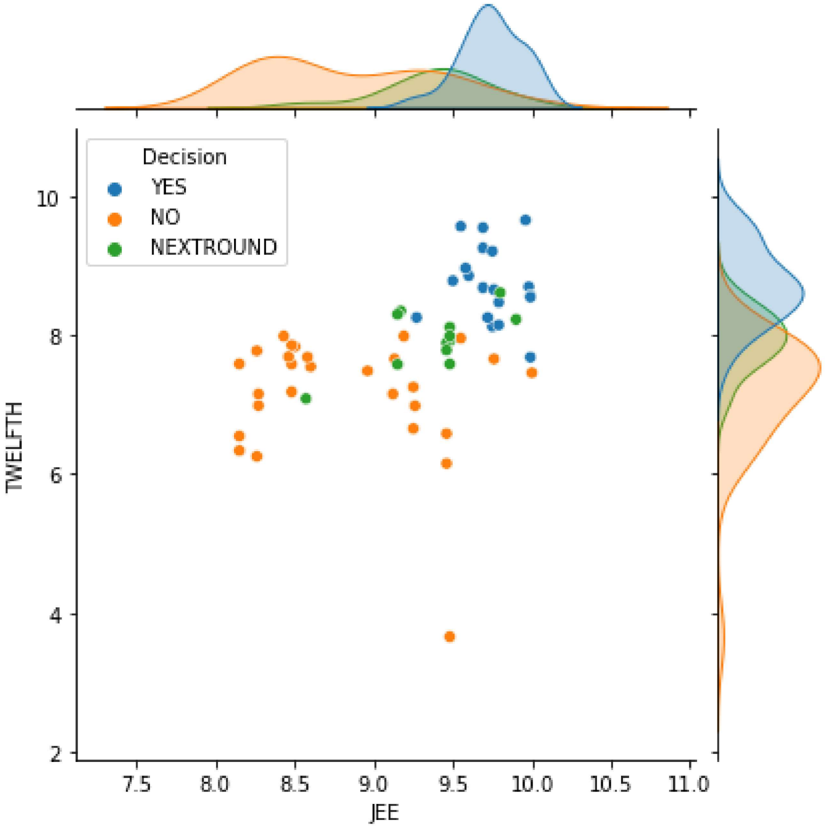


In [9]:

```
sns.jointplot(data=data,x="JEE",y="TWELFTH",hue="Decision")
```

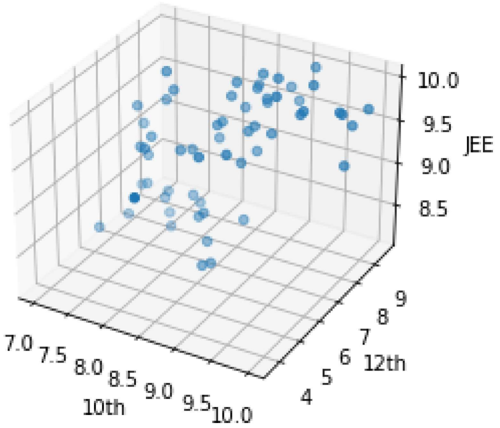
Out[9]:

```
<seaborn.axisgrid.JointGrid at 0x16a91298af0>
```



In [10]:

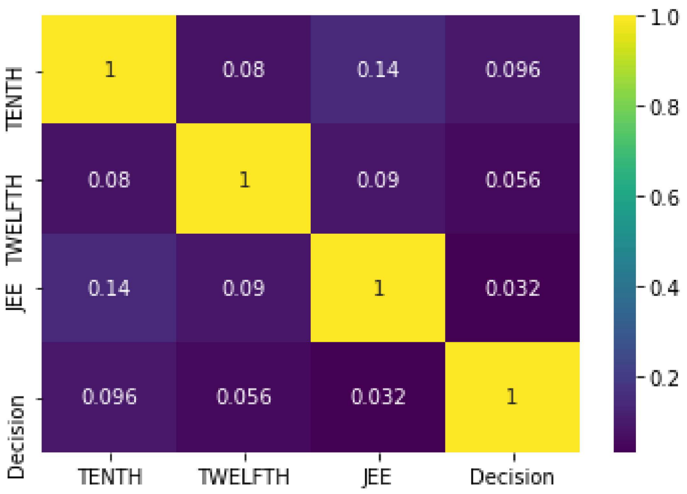
```
fig=plt.figure()
ax=fig.add_subplot(111,projection='3d')
x=data['TENTH']
y=data['TWELFTH']
z=data['JEE']
ax.set_xlabel("10th")
ax.set_ylabel("12th")
ax.set_zlabel("JEE")
ax.scatter(x,y,z)
plt.show()
```



In [11]:

```
cf=data.copy()
cf["Decision"]=cf["Decision"].astype("category")
cf["Decision"]=cf["Decision"].cat.codes
sns.heatmap(cf.corr()**3,annot=True,cmap='viridis')
```

Out[11]: <AxesSubplot:>



In [12]:

```
cf.head()
```

Out[12]:

	TENTH	TWELFTH	JEE	Decision
0	8.400	8.785	9.50	2
1	9.870	8.857	9.60	2
2	9.822	8.475	9.79	2
3	9.129	7.682	9.99	2
4	9.369	8.698	9.98	2

In [13]:

```
X=cf.drop("Decision",axis=1)
y=cf["Decision"]
```

In [14]:

```
from sklearn.preprocessing import StandardScaler
prep=StandardScaler()
X=prep.fit_transform(X)
```

In [15]:

```
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)
```

In [16]:

```
from sklearn.neighbors import KNeighborsClassifier
from sklearn.linear_model import LogisticRegression
from sklearn.ensemble import RandomForestClassifier
rforest=RandomForestClassifier()
knc=KNeighborsClassifier()
lregression=LogisticRegression()
rforest.fit(X_train,y_train)
knc.fit(X_train,y_train)
lregression.fit(X_train,y_train)
print("The score for Random Forest Classifier is {:.2f}".format(rforest.score(X_test,y_
print("The score for K-Nearest Neighbor Classifier is {:.2f}".format(knc.score(X_test,y
print("The score for Logistic Regression is {:.2f}".format(lregression.score(X_test,y_t
The score for Random Forest Classifier is 0.80
The score for K-Nearest Neighbor Classifier is 0.67
The score for Logistic Regression is 0.67
```

In [17]:

```
error=[]
for e in range (1,50):
    knc=KNeighborsClassifier()
    knc.fit(X_train,y_train)
    p=knc.predict(X_test)
    error.append(np.mean(y_test!=p))
```

In [19]:

```
score=[]
for i in range(1,60):
    X_train,X_test,y_train,y_test=train_test_split(X,y,test_size=0.25)
    knn=KNeighborsClassifier(n_neighbors=3)
    knn.fit(X_train,y_train)
    score.append(knn.score(X_test,y_test))
np.array(score).mean()
```

Out[19]:

```
0.8485875706214688
```