In [67]:
```
#Importing the Libraries
import numpy as np
import pandas as pd
import os
import plotly.express as px
import plotly.graph_objects as go
from plotly.subplots import make_subplots
import plotly.express as px
from sklearn import preprocessing
import seaborn as sns
import matplotlib.pyplot as plt
import math
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import accuracy_score
from sklearn.neighbors import KNeighborsClassifier
from sklearn import metrics
from sklearn.model_selection import train_test_split
from sklearn.model_selection import cross_val_score
from sklearn import preprocessing
from sklearn import svm
from sklearn.svm import SVC
```

In [ ]:
```
#Data Collection and Preparation
#Read The Data Set
df=pd.read_csv("E:\\NMDS\collegePlace.csv")
df.head()
```

In [3]:
```
df['Stream'].value_counts()
```

Out[3]:
```
Computer Science                776
Information Technology          691
Electronics And Communication   424
Mechanical                      424
Electrical                      334
Civil                           317
Name: Stream, dtype: int64
```

In [10]:
```
#Handling Mising Values
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2966 entries, 0 to 2965
Data columns (total 8 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   Age                2966 non-null   int64
 1   Gender             2966 non-null   object
 2   Stream             2966 non-null   object
 3   Internships        2966 non-null   int64
 4   CGPA               2966 non-null   int64
 5   Hostel             2966 non-null   int64
 6   HistoryOfBacklogs  2966 non-null   int64
 7   PlacedOrNot        2966 non-null   int64
dtypes: int64(6), object(2)
memory usage: 162.3+ KB
```

In [2]:
```
#Handling Mising Values
```

```
df.isnull().sum()
```

Out[2]:

```
Age                 0
Gender              0
Stream              0
Internships         0
CGPA                0
Hostel              0
HistoryOfBacklogs   0
PlacedOrNot         0
dtype: int64
```

In [13]:

```
#Handling Categorical Values
df.describe()
```

Out[13]:

	Age	Internships	CGPA	Hostel	HistoryOfBacklogs	PlacedOrNot
count	2966.000000	2966.000000	2966.000000	2966.000000	2966.000000	2966.000000
mean	21.485840	0.703641	7.073837	0.269049	0.192178	0.552596
std	1.324933	0.740197	0.967748	0.443540	0.394079	0.497310
min	19.000000	0.000000	5.000000	0.000000	0.000000	0.000000
25%	21.000000	0.000000	6.000000	0.000000	0.000000	0.000000
50%	21.000000	1.000000	7.000000	0.000000	0.000000	1.000000
75%	22.000000	1.000000	8.000000	1.000000	0.000000	1.000000
max	30.000000	3.000000	9.000000	1.000000	1.000000	1.000000

In [12]:

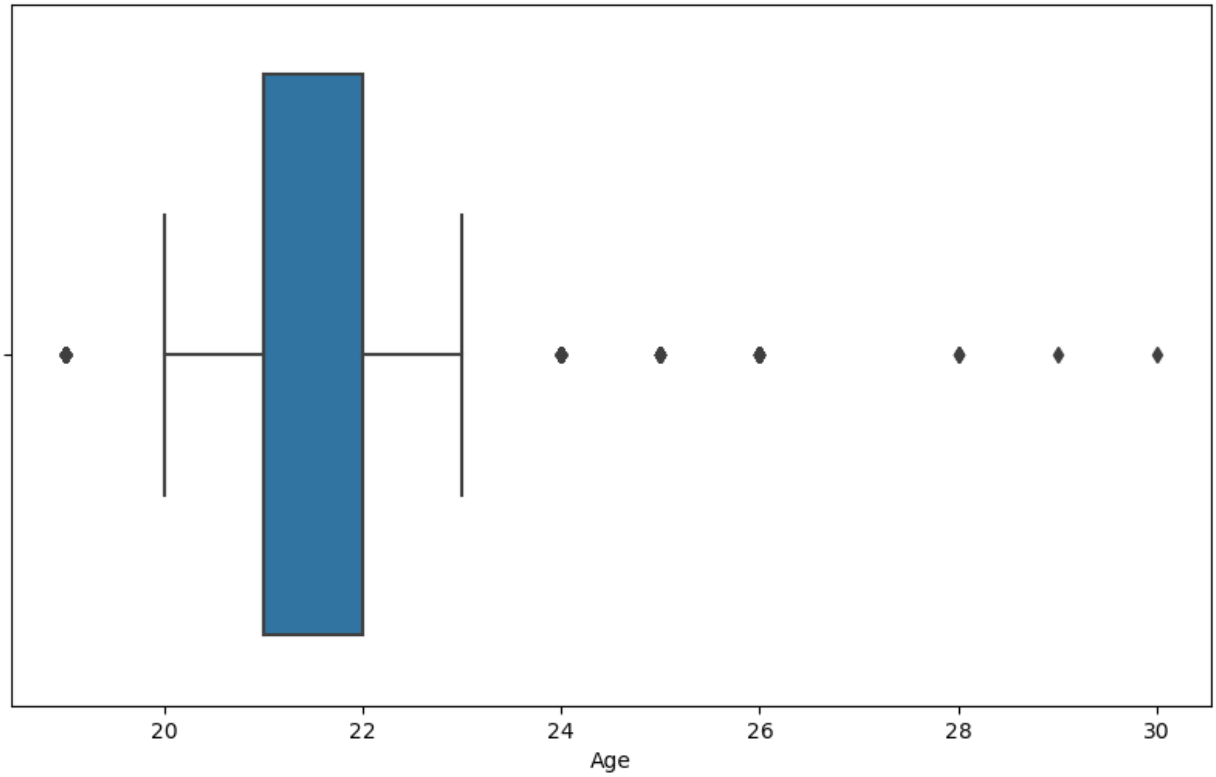
```
#Handling Outliers
def transformationplot(feature):
    plt.figure(figsize=(12,5))
    plt.subplot(1,2,1)
    sns.displot(feature)
    transformationplot(np.log(df['Age']))
    plt.show()
```

In [14]:

```
# I tried all the columns and find out that only age column has some outliers.

plt.figure(figsize = (10, 6), dpi = 100)
sns.boxplot(x = "Age", data = df)
```

Out[14]:

```
<AxesSubplot:xlabel='Age'>
```



In [15]:
```
#Removing Outlier
max_thresold = df['Age'].quantile(0.95)
print(max_thresold)

min_thresold = df['Age'].quantile(0.01)
print(min_thresold)

df = df[(df['Age']<max_thresold) & (df['Age']>min_thresold)]
```

```
24.0
19.0
```

In [16]:
```
#Handling Categorical values
#Lable Encoding
df=df.replace(['Male'],[0])
df=df.replace(['Female'],[1])
df=df.replace(['Computer Science','Information Technology','Electronics And Communicat
df.drop(['Hostel'],axis=1)
```

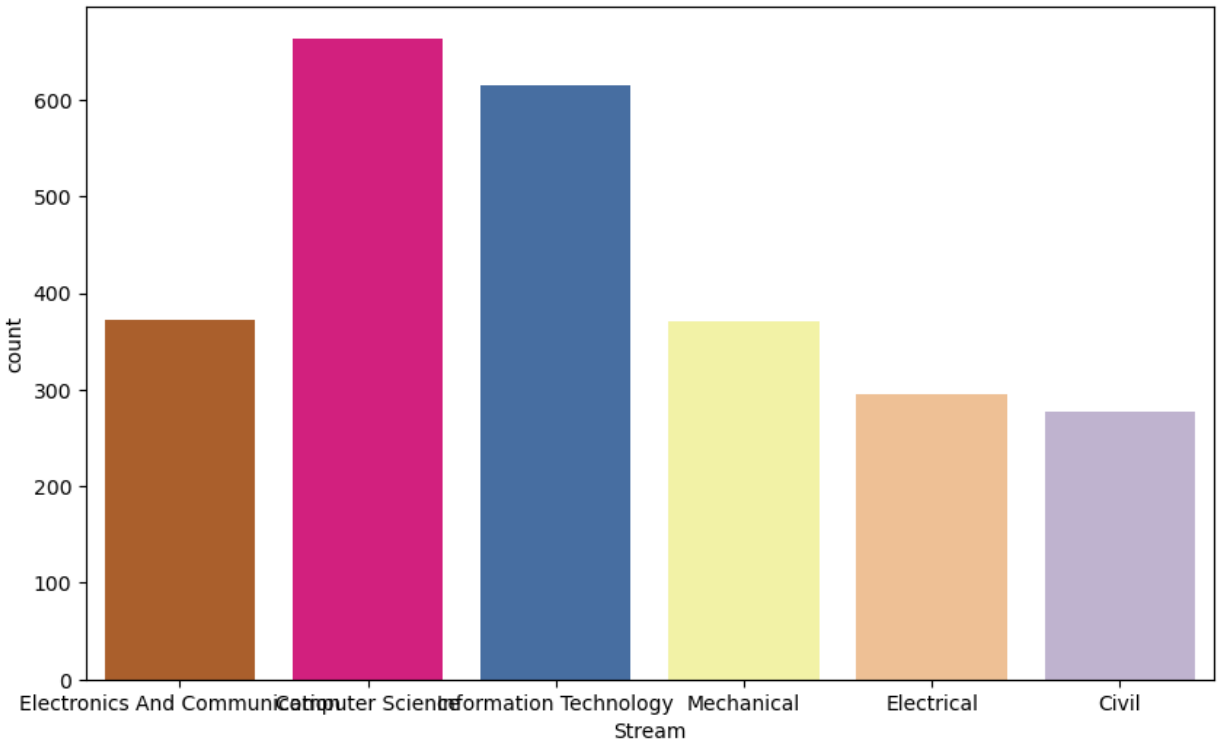
Out[16]:

	Age	Gender	Stream	Internships	CGPA	HistoryOfBacklogs	PlacedOrNot
0	22	0	2	1	8	1	1
1	21	1	0	0	7	1	1
2	22	1	1	1	6	0	1
3	21	0	1	0	8	1	1
4	22	0	4	0	8	0	1
...	...	...	...	...	...	...	...
2961	23	0	1	0	7	0	0
2962	23	0	4	1	7	0	0
2963	22	0	1	1	7	0	0
2964	22	0	0	1	7	0	0
2965	23	0	5	0	8	0	1

2595 rows × 7 columns

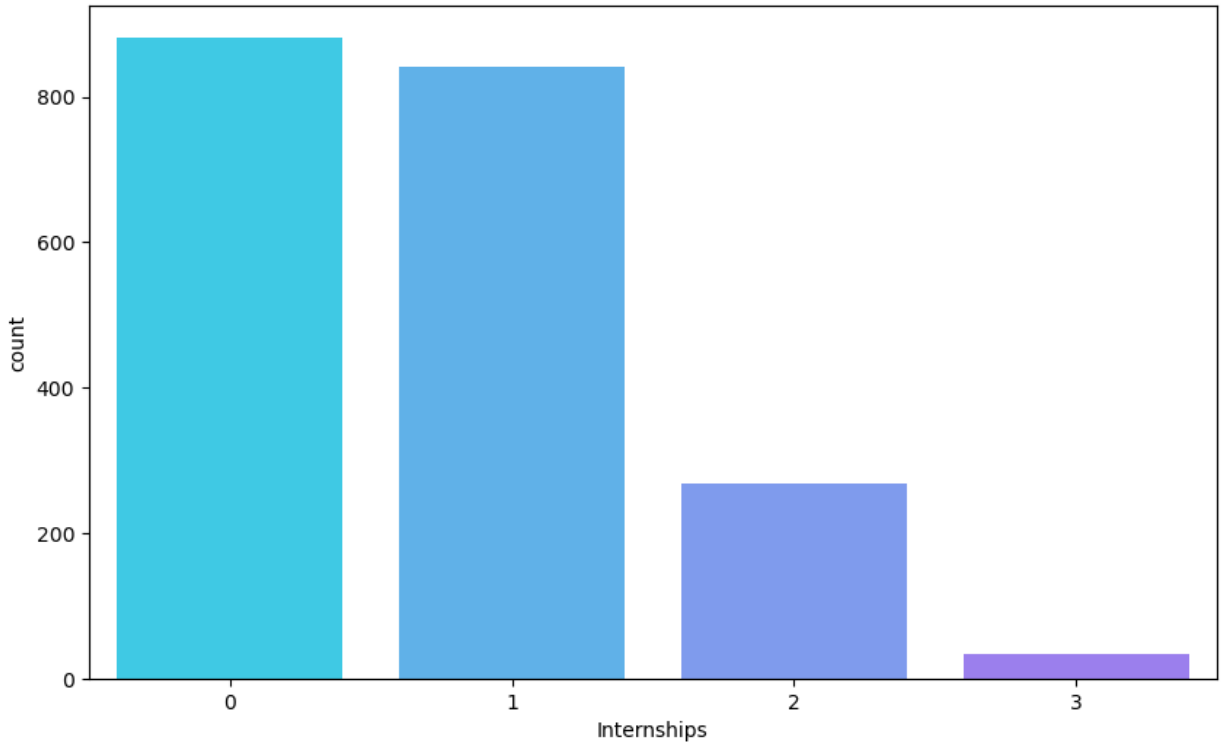
In [25]:
```
#Exploratory Data Abnliysis
#Data Visualization count of stream
plt.figure(figsize = (10, 6), dpi = 100)
color_palette = sns.color_palette("Accent_r")
sns.set_palette(color_palette)
sns.countplot(x = "Stream", data = df)
```

Out[25]:
```
<Axes: xlabel='Stream', ylabel='count'>
```

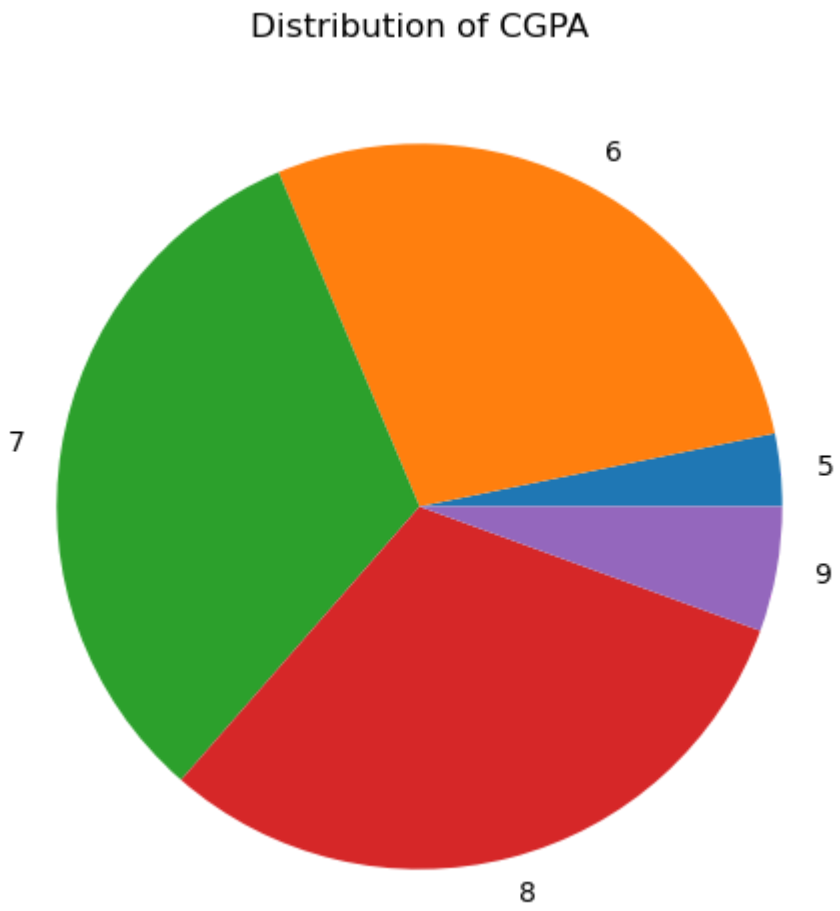


In [27]:
```
#Data Visualization count of Internships
plt.figure(figsize = (10, 6), dpi = 100)
```

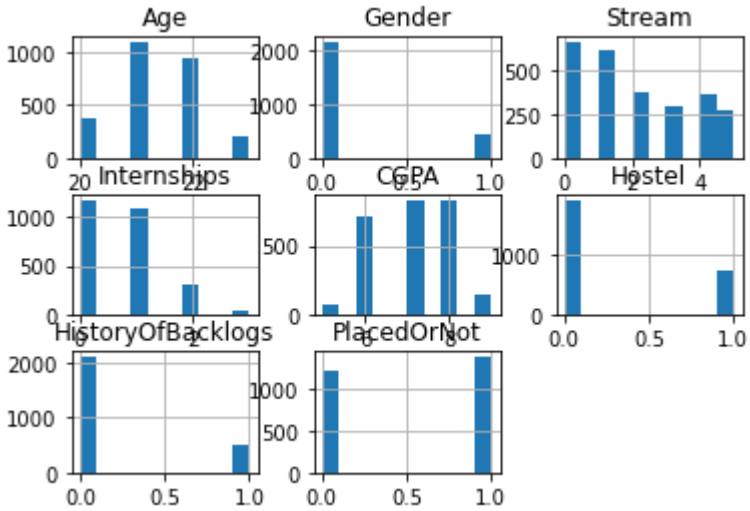
```
color_palette = sns.color_palette("cool")
sns.set_palette(color_palette)
sns.countplot(x = "Internships", data = df)
plt.show()
```



In [5]:
```
#Data Visualization  Distribution of CGPA
plt.figure(figsize = (10, 6), dpi = 100)
grp = dict(df.groupby('CGPA').groups)

m = {}

for key, val in grp.items():

    if key in m:
        m[key] += len(val)

    else:
        m[key] = len(val)


plt.title("Distribution of CGPA")
plt.pie(m.values(), labels = m.keys())
plt.show()
```

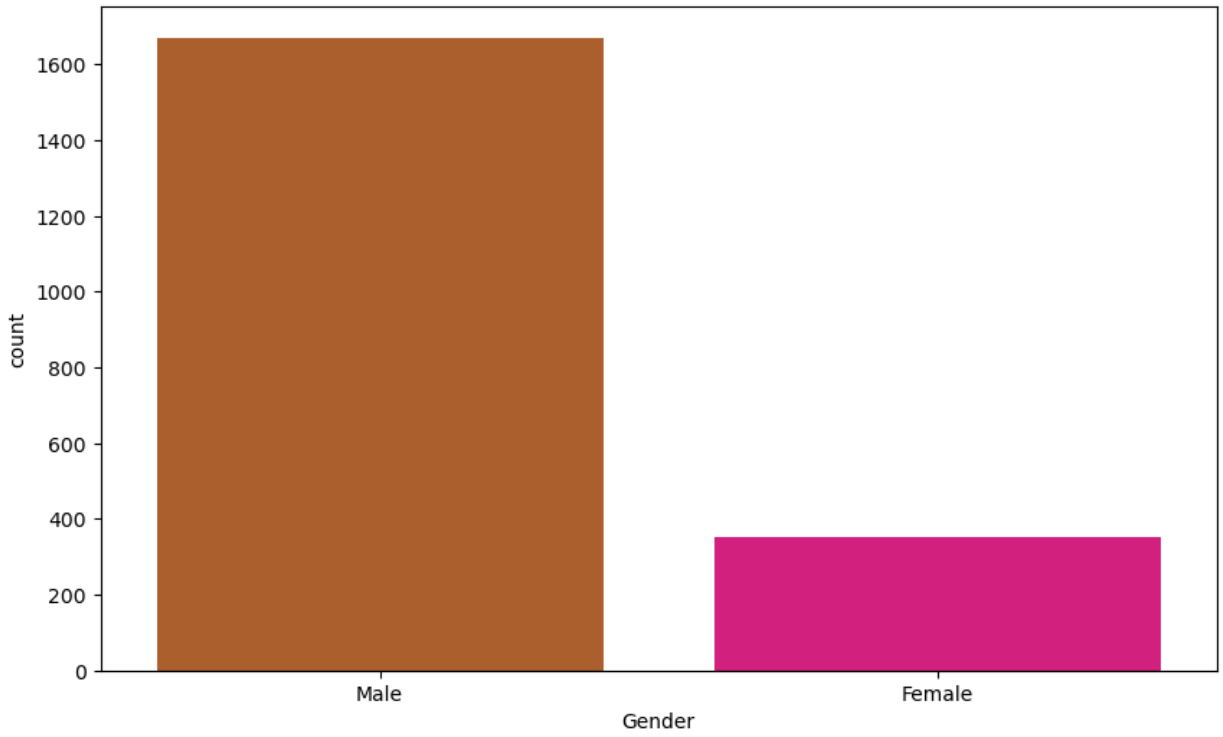


In [24]:
```
#Univariate Analysis
df.hist()
plt.show()
```

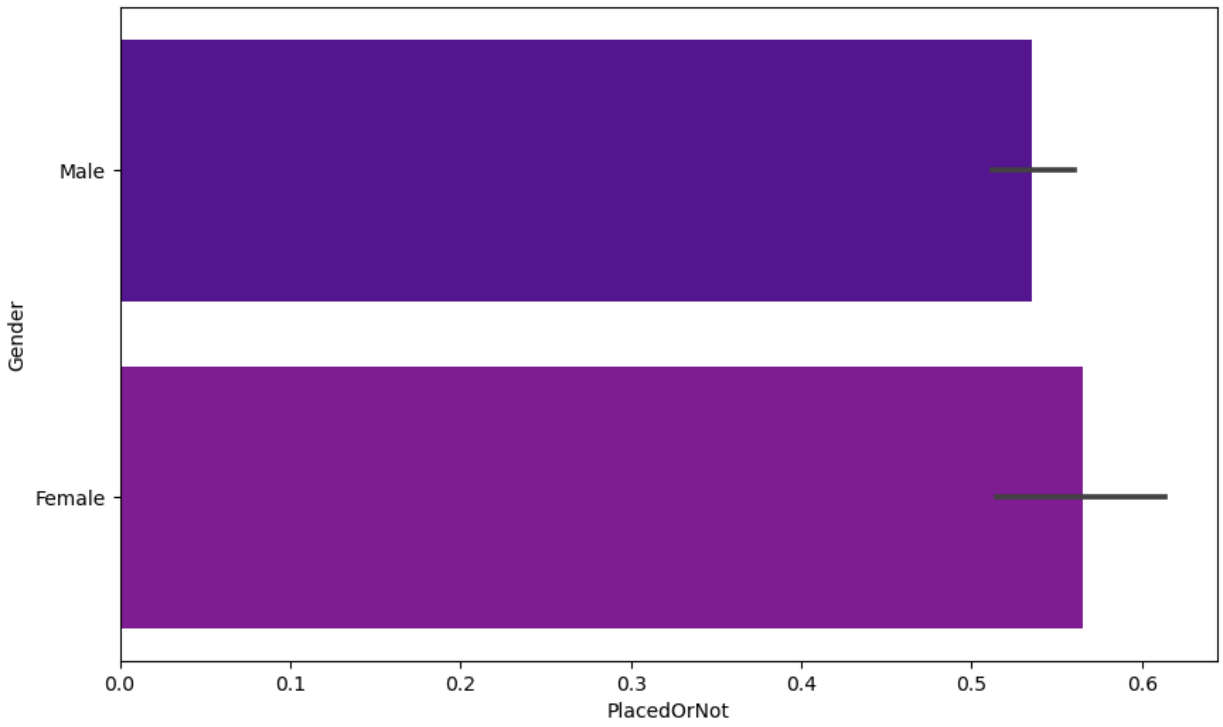


In [31]:
```
plt.figure(figsize = (10, 6), dpi = 100)
# setting the different color palette
color_palette = sns.color_palette("Accent_r")
sns.set_palette(color_palette)

sns.countplot(x = "Gender", data = df)
```

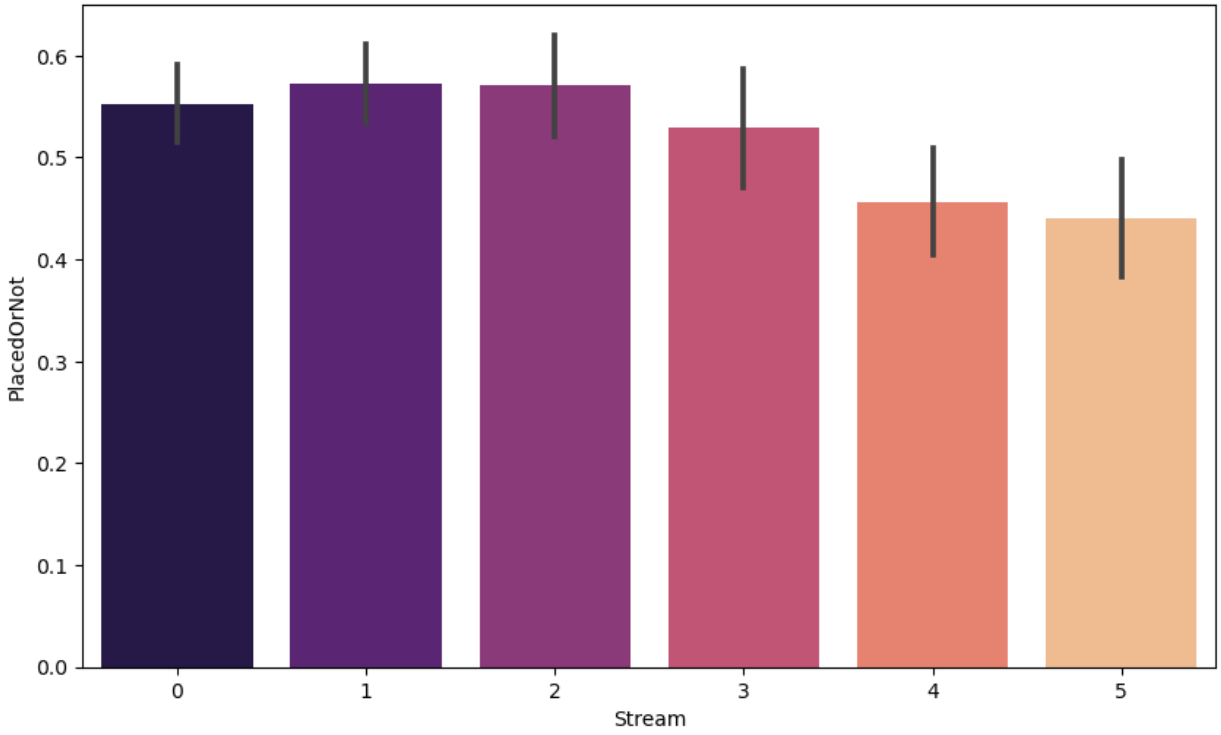
```
plt.show()
```



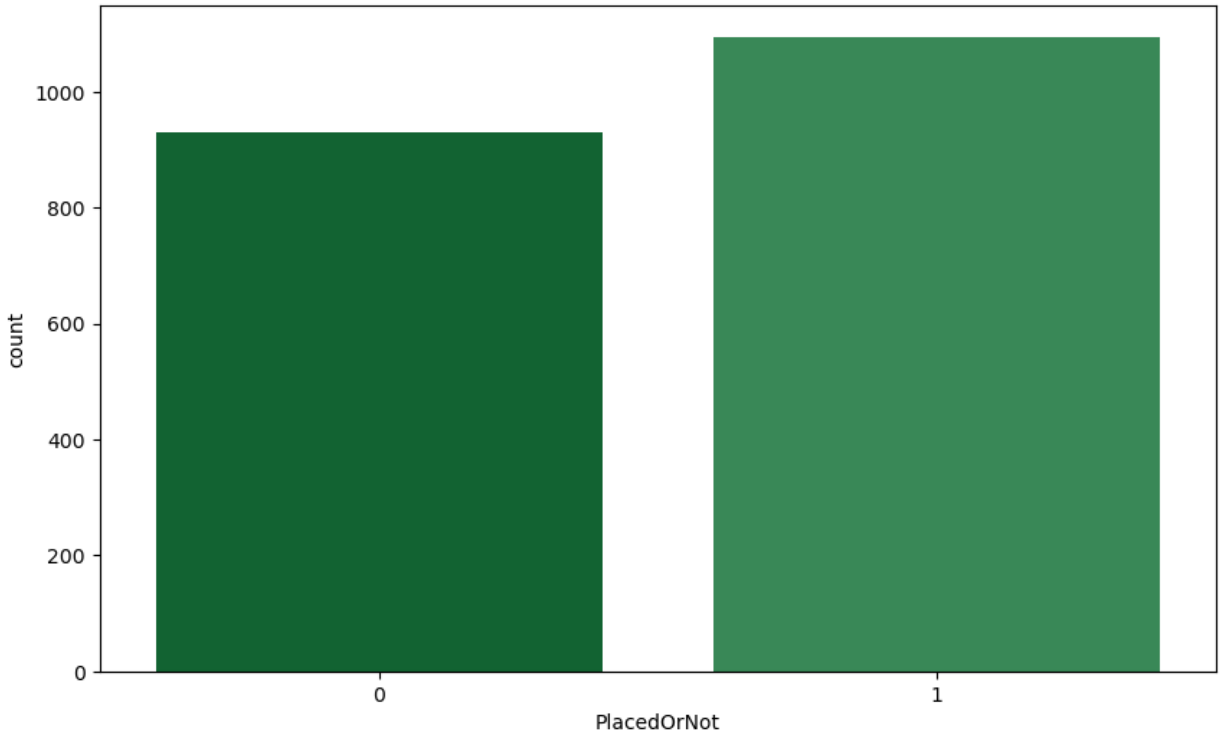
In [33]:
```
#Relationships
#Multivariate Analysis
plt.figure(figsize = (10, 6), dpi = 100)
# setting the different color palette
color_palette = sns.color_palette("plasma")
sns.set_palette(color_palette)
sns.barplot(x = "PlacedOrNot", y = "Gender", data = df)
plt.show()
```



In [33]:
```
#Multivariate Analysis
plt.figure(figsize = (10, 6), dpi = 100)
# setting the different color palette
color_palette = sns.color_palette("magma")
sns.set_palette(color_palette)
sns.barplot(x = "Stream", y = "PlacedOrNot", data = df)
plt.show()
```

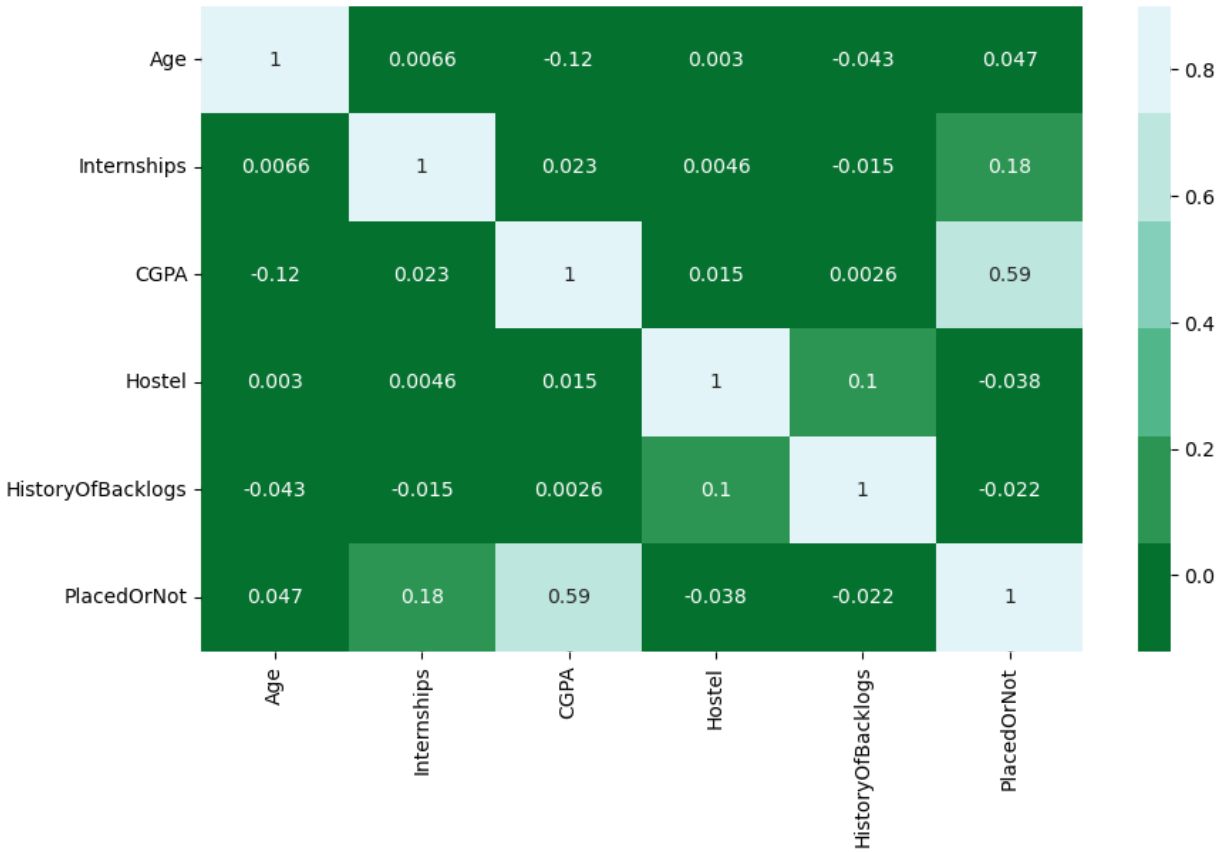


In [35]:
```
# How many placed
plt.figure(figsize = (10, 6), dpi = 100)


# setting the different color palette
color_palette = sns.color_palette("BuGn_r")
sns.set_palette(color_palette)

sns.countplot(x = "PlacedOrNot", data = df)

plt.show()
```



In [6]:
```
#Scaling the Data
#Correllation
plt.figure(figsize = (10, 6), dpi = 100)
color = sns.color_palette("BuGn_r")
sns.heatmap(df.corr(), vmax=0.9, annot=True,cmap = color)
```

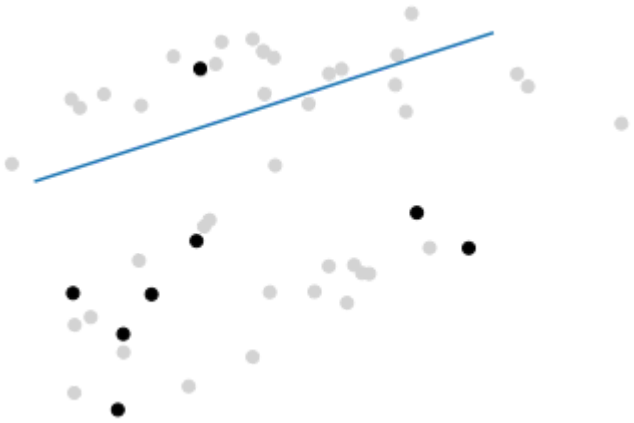
Out[6]: <AxesSubplot:>



In [8]:
```
#Model Building
#mode1:SVM
classifier=svm.SVC(kernel='linear')
```

In [18]:
```
#mode1:SVM
import numpy as np
from sklearn.datasets import make_classification
from sklearn import svm
from sklearn.model_selection import train_test_split
 classes = 4
X,t= make_classification(100, 5, n_classes = classes, random_state= 40, n_informative
#%%
X_train, X_test, y_train, y_test=  train_test_split(X, t , test_size=0.50)
#%%
model = svm.SVC(kernel = 'linear', random_state = 0, C=1.0)
#%%
model.fit(X_train, y_train)
#%%
y=model.predict(X_test)
y2=model.predict(X_train)
#%%
from sklearn.metrics import accuracy_score
score =accuracy_score(y, y_test)
print(score)
score2 =accuracy_score(y2, y_train)
print(score2)
#%%
import matplotlib.pyplot as plt
color = ['black' if c == 0 else 'lightgrey' for c in y]
plt.scatter(X_train[:,0], X_train[:,1], c=color)

# Create the hyperplane
w = model.coef_[0]
a = -w[0] / w[1]
xx = np.linspace(-2.5, 2.5)
yy = a * xx - (model.intercept_[0]) / w[1]

# Plot the hyperplane
plt.plot(xx, yy)
plt.axis("off"), plt.show();
```

```
0.88
0.96
```



In [43]:
```
# Spot-Check Algorithms
models = []
#models.append(('LR', LogisticRegression()))
#models.append(('LDA', LinearDiscriminantAnalysis()))
models.append(('KNN', KNeighborsClassifier()))
#models.append(('CART', DecisionTreeClassifier()))
#models.append(('NB', GaussianNB()))
models.append(('SVM', SVC()))
# evaluate each model in turn
results = []
names = []
for name, model in models:
  #  kfold = KFold(n_splits=10, random_state=seed)
    cv_results = cross_val_score(model, X_train, y_train, scoring='accuracy')
results.append(cv_results)
names.append(name)
msg = "%s: %f (%f)" % (name, cv_results.mean(), cv_results.std())
print(msg)
```

```
SVM: 0.920000 (0.040000)
```

In [63]:
```
# KNN Classification
#Handling Categorical values
#Lable Encoding
df=pd.read_csv("E:\\NMDS\collegePlace.csv")
df=df.replace(['Male'],[0])
df=df.replace(['Female'],[1])
df=df.replace(['Computer Science','Information Technology','Electronics And Communicat
df.drop(['Hostel'],axis=1)
#from pandas import read_csv
#from sklearn.model_selection import KFold
#from sklearn.model_selection import cross_val_score
from sklearn.neighbors import KNeighborsClassifier
#df = read_csv(filename, names=names)
array = df.values
X = array[:,0:7]
Y = array[:,7]
#num_folds = 5
#kfold = KFold(n_splits=5, random_state=3)
model = KNeighborsClassifier()
results = cross_val_score(model,X,Y)
print(results.mean())
```

```
0.8334491627914898
```

In [66]:
```
import pikle
import joblib
pickle.dump((knn,open("placement.pkl","wb"))
model=pickle.load(open("placement.pkl","rb")))
```

```
  Input In [66]
    model=pickle.load(open("placement.pkl","rb")))
    ^
SyntaxError: invalid syntax
```

In [ ]:
```
from flask
```

In [ ]:
```

```