Sania David

In [1]:
```
import warnings
warnings.filterwarnings('ignore')

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

In [3]:
```
df=pd.read_csv('Iris.csv')
df
```

Out[3]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa
...	...	...	...	...	...	...
145	146	6.7	3.0	5.2	2.3	Iris-virginica
146	147	6.3	2.5	5.0	1.9	Iris-virginica
147	148	6.5	3.0	5.2	2.0	Iris-virginica
148	149	6.2	3.4	5.4	2.3	Iris-virginica
149	150	5.9	3.0	5.1	1.8	Iris-virginica

150 rows × 6 columns

In [4]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 150 entries, 0 to 149
Data columns (total 6 columns):
 #   Column         Non-Null Count  Dtype  
---  ------         --------------  -----  
 0   Id             150 non-null    int64  
 1   SepalLengthCm  150 non-null    float64
 2   SepalWidthCm   150 non-null    float64
 3   PetalLengthCm  150 non-null    float64
 4   PetalWidthCm   150 non-null    float64
 5   Species        150 non-null    object 
dtypes: float64(4), int64(1), object(1)
memory usage: 7.2+ KB
```

In [5]:
```
df["Species"].value_counts()
```

Out[5]:
```
Species
Iris-setosa        50
Iris-versicolor    50
Iris-virginica     50
Name: count, dtype: int64
```

In [6]:
```
df=df.drop(columns=["Id"])
df.head(10)
```

Out[6]:

	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	5.1	3.5	1.4	0.2	Iris-setosa
1	4.9	3.0	1.4	0.2	Iris-setosa
2	4.7	3.2	1.3	0.2	Iris-setosa
3	4.6	3.1	1.5	0.2	Iris-setosa
4	5.0	3.6	1.4	0.2	Iris-setosa
5	5.4	3.9	1.7	0.4	Iris-setosa
6	4.6	3.4	1.4	0.3	Iris-setosa
7	5.0	3.4	1.5	0.2	Iris-setosa
8	4.4	2.9	1.4	0.2	Iris-setosa
9	4.9	3.1	1.5	0.1	Iris-setosa

In [7]:
```
df.columns
```

Out[7]:
```
Index(['SepalLengthCm', 'SepalWidthCm', 'PetalLengthCm', 'PetalWidthCm',
       'Species'],
      dtype='object')
```

In [8]:
```
df.isnull().sum()
```

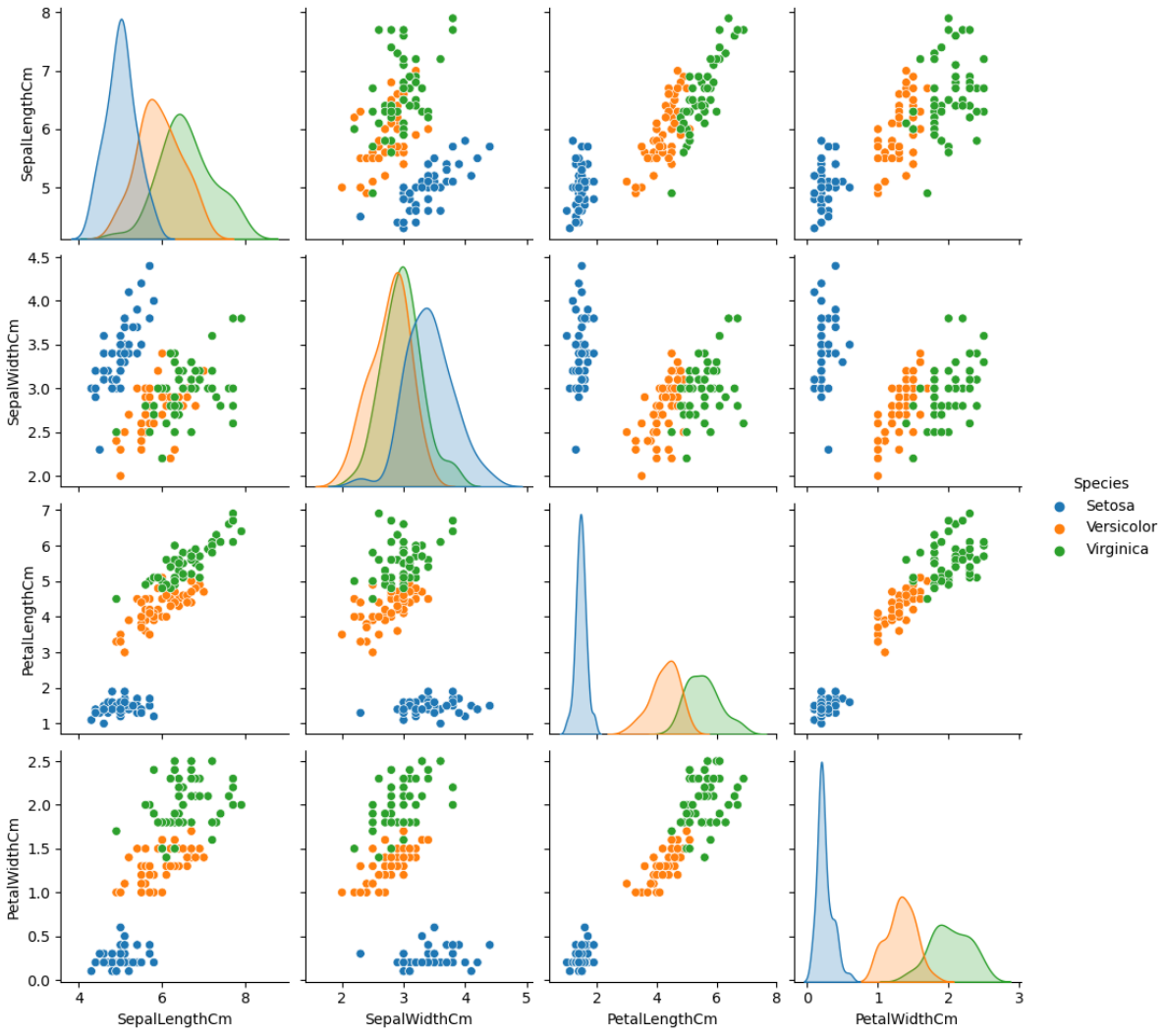
Out[8]:
```
SepalLengthCm    0
SepalWidthCm     0
PetalLengthCm    0
PetalWidthCm     0
Species          0
dtype: int64
```

In [10]:
```
from sklearn.preprocessing import LabelEncoder
le=LabelEncoder()
df['Species'] =le.fit_transform(df['Species'])
df["Species"]
```

Out[10]:
```
0      0
1      0
2      0
3      0
4      0
      ..
145    2
146    2
147    2
148    2
149    2
Name: Species, Length: 150, dtype: int32
```

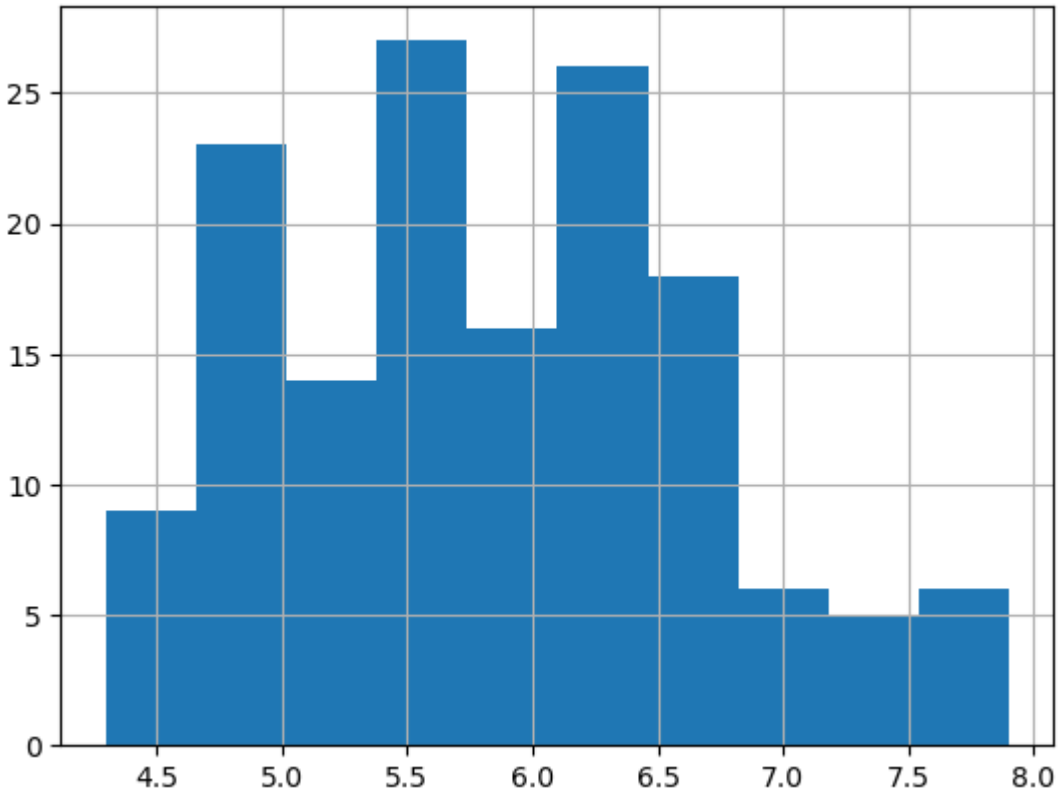
In [12]:
```
hue_mapping = {0:'Setosa', 1 : 'Versicolor', 2 : 'Virginica'}
df['Species'] = df['Species'].map(hue_mapping)

sns.pairplot(df, hue ='Species', diag_kind='kde')
plt.show()
```



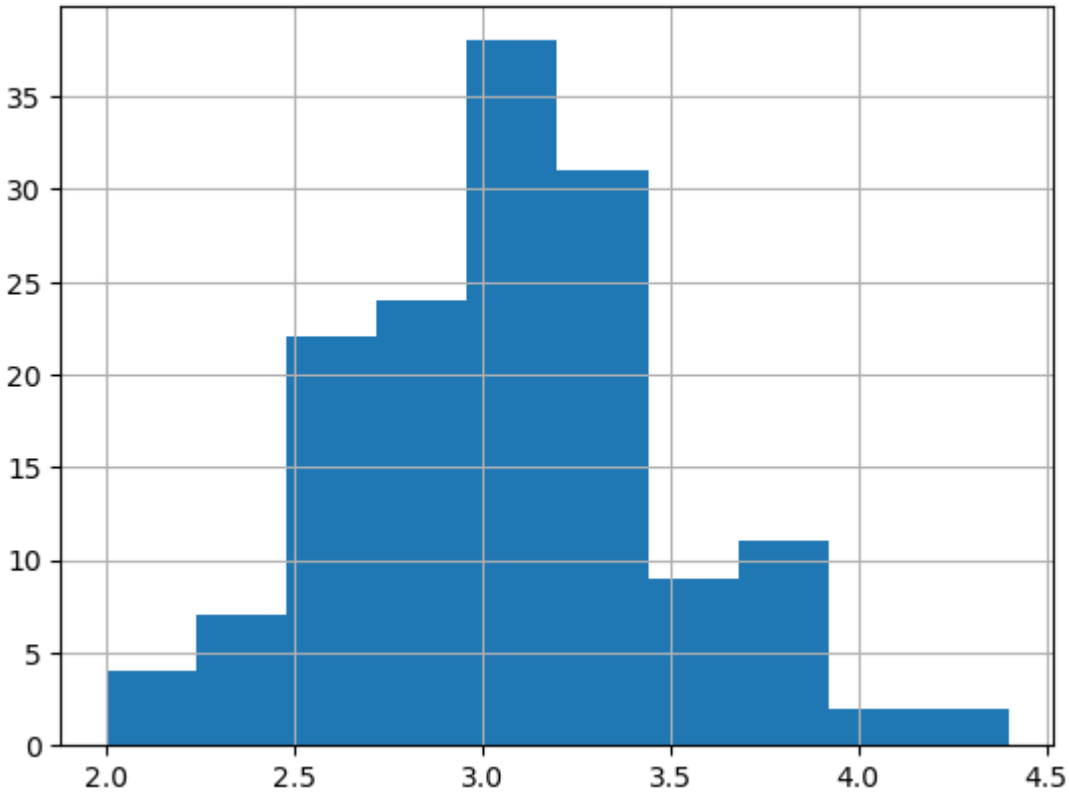
In [13]:
```
df['SepalLengthCm'].hist()
```

Out[13]: <Axes: >



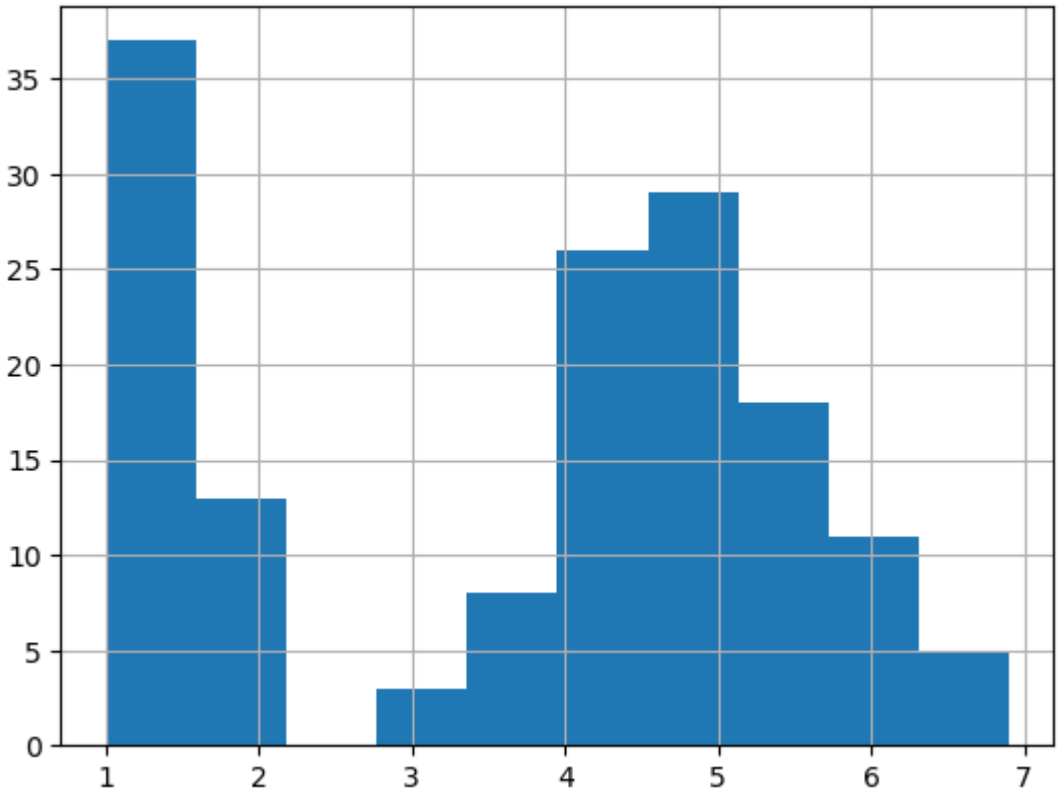
In [14]:
```
df['SepalWidthCm'].hist()
```

Out[14]: <Axes: >



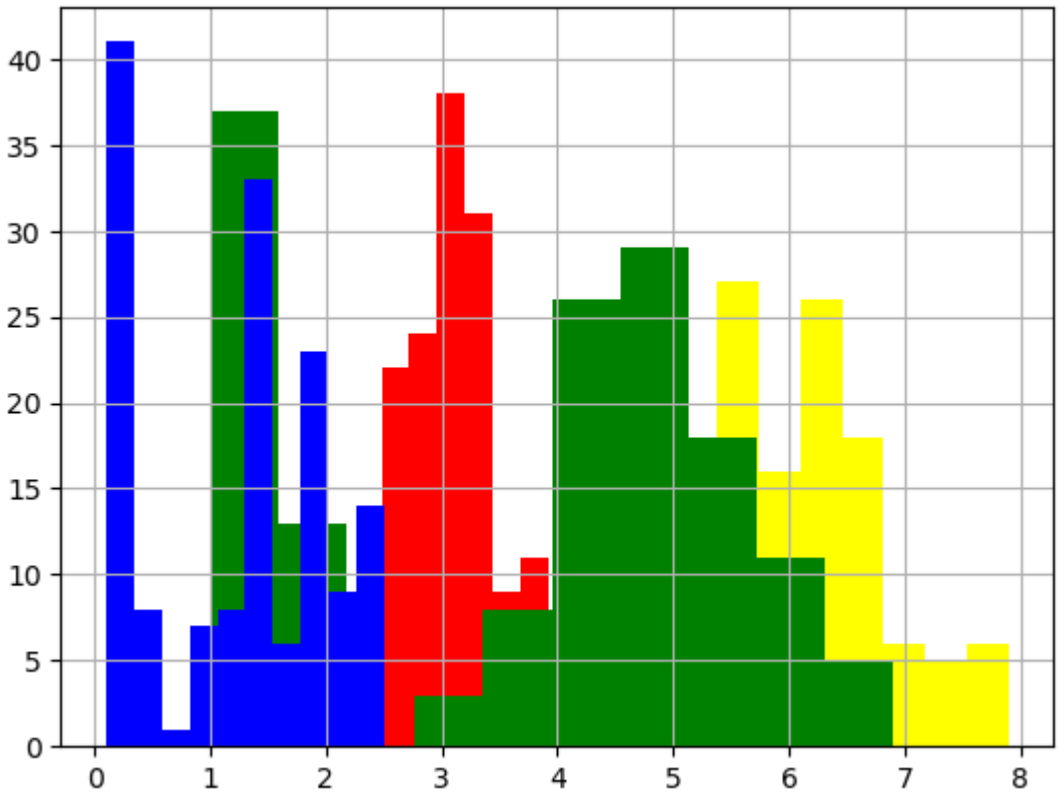
In [15]:
```
df['PetalLengthCm'].hist()
```

Out[15]: <Axes: >



In [21]:
```
df['SepalLengthCm'].hist(color='yellow')
df['SepalWidthCm'].hist(color='red')
df['PetalLengthCm'].hist(color='green')
df['PetalWidthCm'].hist(color='blue')
```

Out[21]: <Axes: >



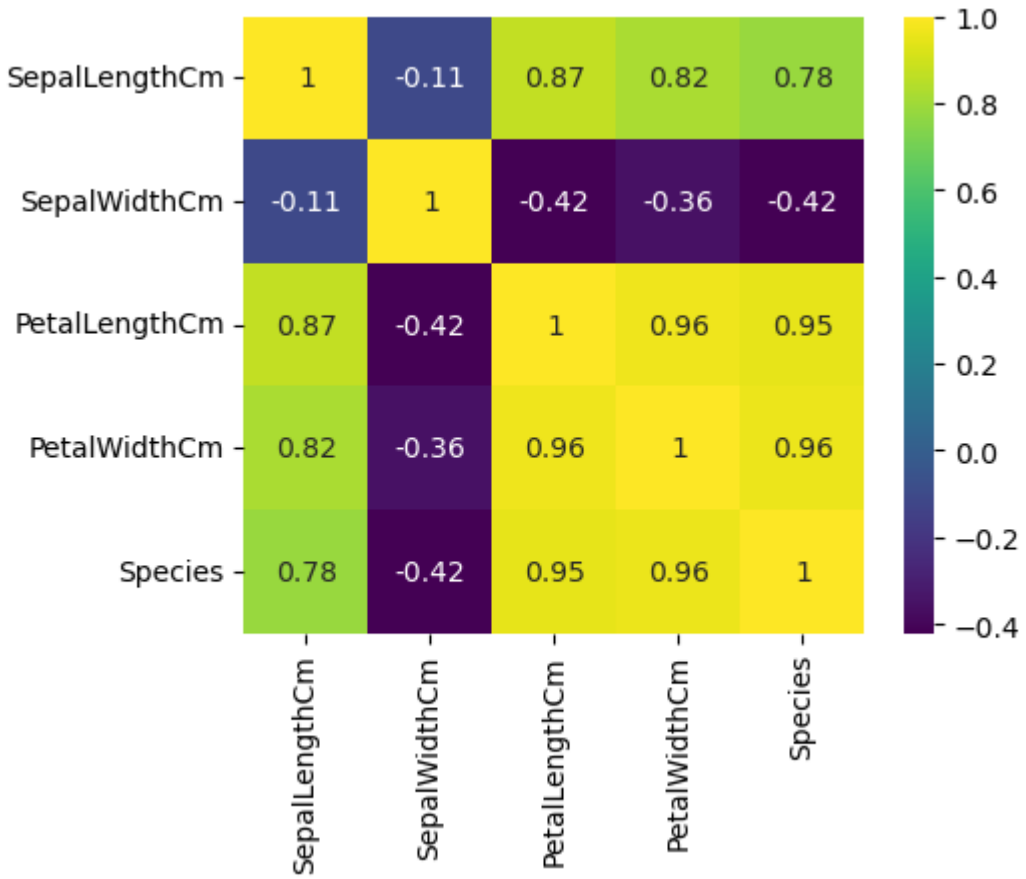
In [22]:
```
from sklearn.preprocessing import LabelEncoder
le = LabelEncoder()
df['Species'] = le.fit_transform(df['Species'])
correlation_matrix = df.corr()
print(correlation_matrix)
```

```
               SepalLengthCm  SepalWidthCm  PetalLengthCm  PetalWidthCm  \
SepalLengthCm       1.000000     -0.109369       0.871754      0.817954
SepalWidthCm       -0.109369      1.000000      -0.420516     -0.356544
PetalLengthCm       0.871754     -0.420516       1.000000      0.962757
PetalWidthCm        0.817954     -0.356544       0.962757      1.000000
Species             0.782561     -0.419446       0.949043      0.956464

                Species
SepalLengthCm  0.782561
SepalWidthCm  -0.419446
PetalLengthCm  0.949043
PetalWidthCm   0.956464
Species        1.000000
```

In [23]:
```
corr = correlation_matrix
fig, ax = plt.subplots(figsize=(5,4))
sns.heatmap(corr, annot=True, ax=ax, cmap='viridis')
```

Out[23]: <Axes: >



In [26]:
```
from sklearn.model_selection import train_test_split
X = df.drop(columns=['Species'])
Y = df['Species']
x_train, x_test, y_train, y_test = train_test_split(X,Y, test_size=0.40)
```

In [27]:
```
from sklearn.linear_model import LogisticRegression
model=LogisticRegression()
model.fit(x_train,y_train)
print("Accuracy(Logistic Regression):",model.score(x_test,y_test)*100)
```

```
Accuracy(Logistic Regression): 98.33333333333333
```