AG3 - Python y Javascript

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Carga de datos y Visaulización del dataset Titanic

```
# Importamos modulos
import pandas as pd
import io
import requests
import seaborn as sns
import timeit
import matplotlib.pyplot as plt
import numpy as np
```

```
# Cargamos el data set de los pasajeros del Titanic
url="https://raw.githubusercontent.com/mwaskom/seaborn-data/master/titanic.csv"
s=requests.get(url).content
titanic=pd.read_csv(io.StringIO(s.decode('utf-8')))
```

```
# Mostramos las 10 primeras filas del Dataset Titanic
titanic.head(10)
```

MOSTRAR RESULTADO OCULTO

```
# Mostramos los campos y sus tipos de datos
titanic.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 15 columns):
survived       891 non-null int64
pclass         891 non-null int64
sex            891 non-null object
age            714 non-null float64
sibsp          891 non-null int64
parch          891 non-null int64
fare           891 non-null float64
embarked       889 non-null object
class          891 non-null object
who            891 non-null object
adult_male     891 non-null bool
deck           203 non-null object
embark_town    889 non-null object
alive          891 non-null object
alone          891 non-null bool
dtypes: bool(2), float64(2), int64(4), object(7)
memory usage: 92.4+ KB
```

```
# Mostrar valores estadísticos de variable cuantitativas
titanic.describe()
```

	survived	pclass	age	sibsp	parch	fare	class_num
count	891.000000	891.000000	714.000000	891.000000	891.000000	891.000000	891.000000
mean	0.383838	2.308642	29.699118	0.523008	0.381594	32.204208	2.308642
std	0.486592	0.836071	14.526497	1.102743	0.806057	49.693429	0.836071
min	0.000000	1.000000	0.420000	0.000000	0.000000	0.000000	1.000000
25%	0.000000	2.000000	20.125000	0.000000	0.000000	7.910400	2.000000
50%	0.000000	3.000000	28.000000	0.000000	0.000000	14.454200	3.000000
75%	1.000000	3.000000	38.000000	1.000000	0.000000	31.000000	3.000000
max	1.000000	3.000000	80.000000	8.000000	6.000000	512.329200	3.000000

Operaciones con columnas

```
# Renombramos la columna class a clase
titanic.rename(columns={'class': 'clase'},
inplace=True)
# Muestra los valores distintos para class (clase)
titanic.clase.unique()
```

```
array(['Third', 'First', 'Second'], dtype=object)
```

```
# Muestra los valores distintos para el campo pclass
titanic.pclass.unique()
```

```
array([3, 1, 2])
```

```
# Añadimos nuevas columnas: is_old, is_baby
# Creamos una función para añadir una nueva columna is_old, para pasajeros > 60 años
def is_old_func(row):
  return row['age'] > 60
titanic['is_old'] = titanic.apply(is_old_func, axis='columns')

# Otra forma de definir una nueva columna. Creamos la columna is_baby, para pasajeros < 15 años
titanic.eval ( ' is_baby = age< 15 ' , inplace = True)
titanic.head(10)
```

	survived	pclass	sex	age	sibsp	parch	fare	embarked	clase	who	adult_male	deck	embark_town	alive	alone	is_old	is_baby
0	0	3	male	22.0	1	0	7.2500	S	Third	man	True	NaN	Southampton	no	False	False	False
1	1	1	female	38.0	1	0	71.2833	C	First	woman	False	C	Cherbourg	yes	False	False	False
2	1	3	female	26.0	0	0	7.9250	S	Third	woman	False	NaN	Southampton	yes	True	False	False
3	1	1	female	35.0	1	0	53.1000	S	First	woman	False	C	Southampton	yes	False	False	False
4	0	3	male	35.0	0	0	8.0500	S	Third	man	True	NaN	Southampton	no	True	False	False
5	0	3	male	NaN	0	0	8.4583	Q	Third	man	True	NaN	Queenstown	no	True	False	False
6	0	1	male	54.0	0	0	51.8625	S	First	man	True	E	Southampton	no	True	False	False
7	0	3	male	2.0	3	1	21.0750	S	Third	child	False	NaN	Southampton	no	False	False	True
8	1	3	female	27.0	0	2	11.1333	S	Third	woman	False	NaN	Southampton	yes	False	False	False
9	1	2	female	14.0	1	0	30.0708	C	Second	child	False	NaN	Cherbourg	yes	False	False	True

```
#del titanic['class_num']
#titanic
```

```
# Creamos una función que crea una nueva columna "class_num" numérica, con valores Third:3,First:1,Second:2
# según el valor del campo clase.
def class_num_func(row):
  Clase={'Third':3,'First':1,'Second':2}
  return Clase[row.clase]
titanic['class_num'] = titanic.apply(class_num_func, axis='columns')

titanic.head(10)
```

	survived	pclass	sex	age	sibsp	parch	fare	embarked	clase	who	adult_male	deck	embark_town	alive	alone	is_old	is_baby	class_num
0	0	3	male	22.0	1	0	7.2500	S	Third	man	True	NaN	Southampton	no	False	False	False	3
1	1	1	female	38.0	1	0	71.2833	C	First	woman	False	C	Cherbourg	yes	False	False	False	1
2	1	3	female	26.0	0	0	7.9250	S	Third	woman	False	NaN	Southampton	yes	True	False	False	3
3	1	1	female	35.0	1	0	53.1000	S	First	woman	False	C	Southampton	yes	False	False	False	1
4	0	3	male	35.0	0	0	8.0500	S	Third	man	True	NaN	Southampton	no	True	False	False	3
5	0	3	male	NaN	0	0	8.4583	Q	Third	man	True	NaN	Queenstown	no	True	False	False	3
6	0	1	male	54.0	0	0	51.8625	S	First	man	True	E	Southampton	no	True	False	False	1
7	0	3	male	2.0	3	1	21.0750	S	Third	child	False	NaN	Southampton	no	False	False	True	3
8	1	3	female	27.0	0	2	11.1333	S	Third	woman	False	NaN	Southampton	yes	False	False	False	3
9	1	2	female	14.0	1	0	30.0708	C	Second	child	False	NaN	Cherbourg	yes	False	False	True	2

```
# Cambiamos el formato númerio del campo class_num a float64
titanic["class_num"] = titanic.class_num.astype('float64')
titanic.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 18 columns):
survived       891 non-null int64
pclass         891 non-null int64
sex            891 non-null object
age            714 non-null float64
sibsp          891 non-null int64
parch          891 non-null int64
fare           891 non-null float64
embarked       889 non-null object
clase          891 non-null object
who            891 non-null object
adult_male     891 non-null bool
deck           203 non-null object
embark_town    889 non-null object
alive          891 non-null object
alone          891 non-null bool
is_old         891 non-null bool
is_baby        891 non-null bool
class_num      891 non-null float64
dtypes: bool(4), float64(3), int64(4), object(7)
memory usage: 101.1+ KB
```

Consulta de datos con condiciones

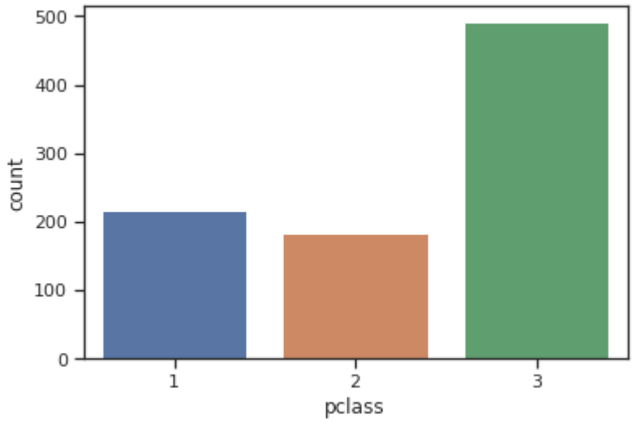
```
# Consulta con condiciones. Pasajeros cuyo sexo sea "Mujer", su clase "First" o "Third", su edad > 45 años y que no hayan sobrevivido
titanic[(titanic.sex == 'female')
  & (titanic['clase'].isin(['First','Third']))
  & (titanic.age > 45 )
  & (titanic.survived == 0)]
```

	survived	pclass	sex	age	sibsp	parch	fare	embarked	clase	who	adult_male	deck	embark_town	alive	alone	is_old	is_baby	class_num
132	0	3	female	47.0	1	0	14.5000	S	Third	woman	False	NaN	Southampton	no	False	False	False	3.0
177	0	1	female	50.0	0	0	28.7125	C	First	woman	False	C	Cherbourg	no	True	False	False	1.0
736	0	3	female	48.0	1	3	34.3750	S	Third	woman	False	NaN	Southampton	no	False	False	False	3.0

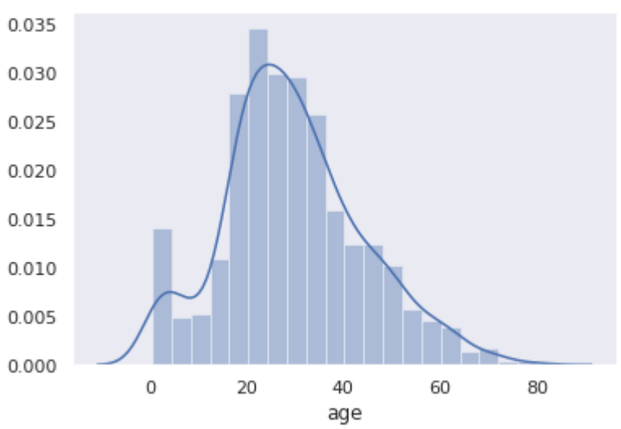
Gráficos

```
# Distribución de las clases
sns.countplot(x="pclass", data=titanic)
```

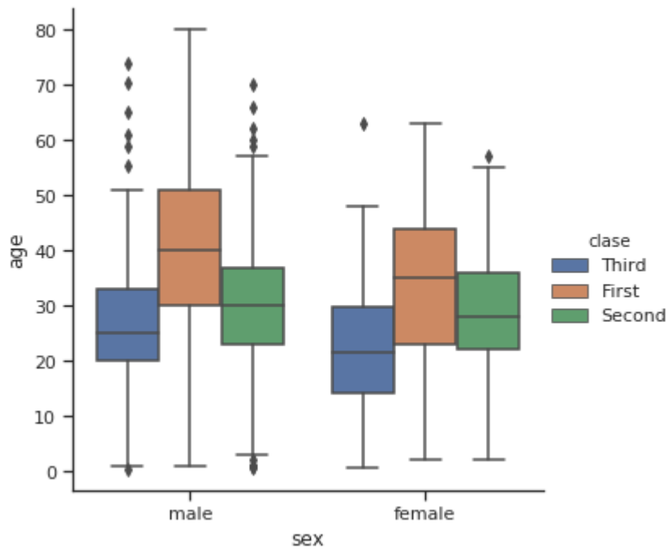
```
<matplotlib.axes._subplots.AxesSubplot at 0x7f331f886ef0>
```




```
# Distribución de la edad (age)
sns.distplot(titanic.age.dropna( ))
plt.show( )
```

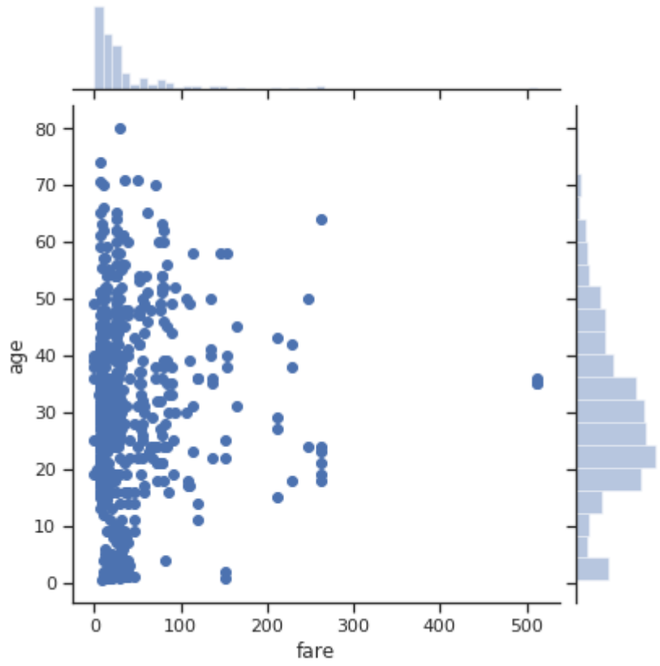



```
# BoxPlot de la edad por sexo y clase
with sns.axes_style(style='ticks'):
  ax = sns.catplot("sex", "age", "clase" ,
data=titanic, kind="box")
```

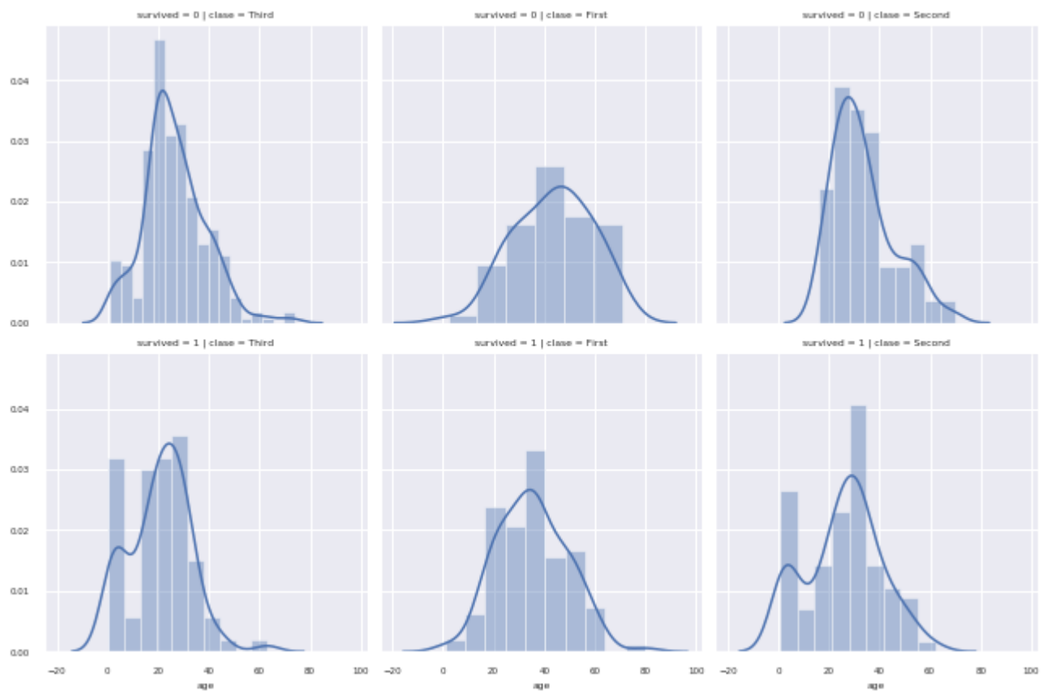



```
# Distribución cruzada de Edad y Tarifa
sns.jointplot(x='fare',y='age',data=titanic)
```

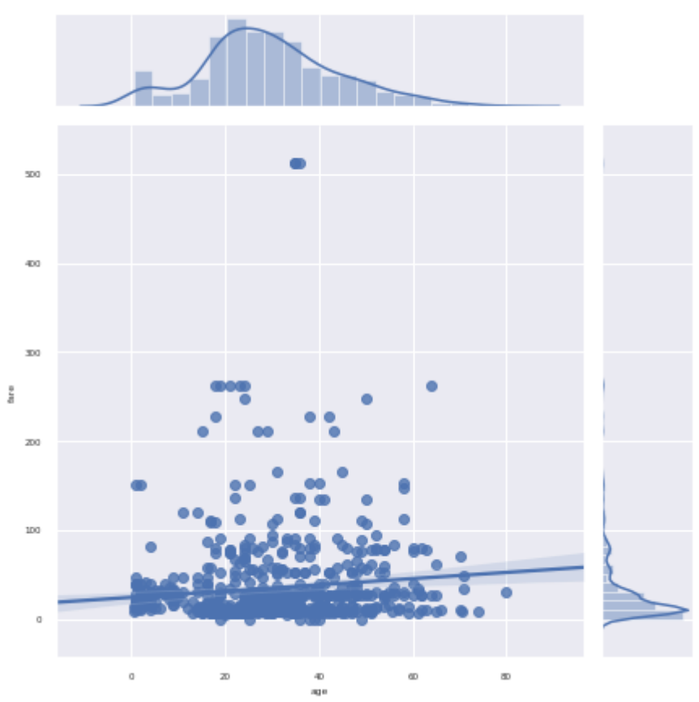
```
<seaborn.axisgrid.JointGrid at 0x7f331fb530f0>
```




```
# Cambiamos el font
sns.set(font_scale=0.5)
# Distribución de la edad según la categorías: survived, clase
g = sns.FacetGrid(titanic, row='survived',col='clase')
g.map(sns.distplot, "age")
plt.show()
```

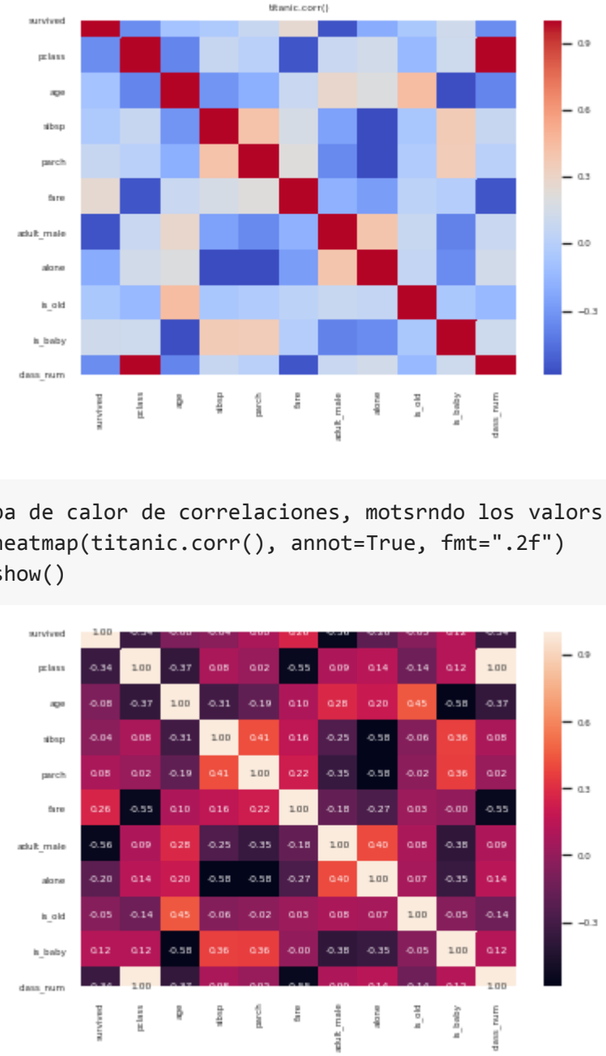



```
# Diagrama de dispersion con Distribucion de cada variable: fare(precio)/age(edad)
sns.jointplot(data=titanic, x='age', y='fare',kind='reg', color='b')
plt.show()
```



```
# Mapa de calor de correlaciones
tc = titanic.corr()
sns.heatmap(tc,cmap='coolwarm')
plt.title('titanic.corr()')
```

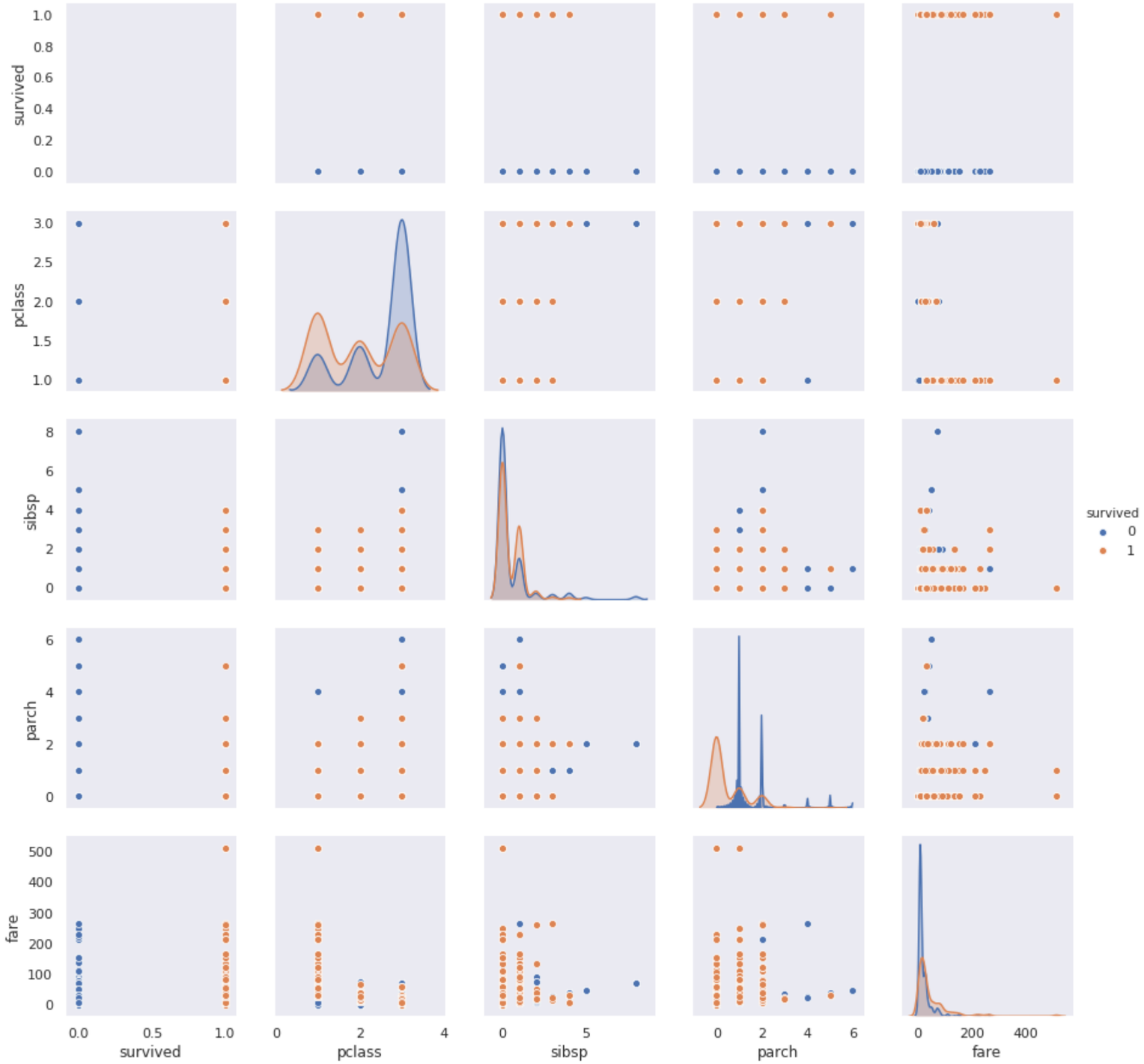
```
Text(0.5, 1, 'titanic.corr()')
```




```
# Mapa de calor de correlaciones, motsrndo los valors de correlación
sns.heatmap(titanic.corr(), annot=True, fmt=".2f")
plt.show()
```

```
#Define un subconjuto de datos con las variables numéricas
titanic_num =titanic[['survived','pclass','sibsp','parch','fare']]
#Hace una matriz de diagramas de dispersión de parejas de variables.
sns.pairplot(titanic_num, hue="survived")
plt.show()
```

```
/usr/local/lib/python3.6/dist-packages/statsmodels/nonparametric/kde.py:487: RuntimeWarning: invalid value encountered in true_divide
  binned = fast_linbin(X, a, b, gridsize) / (delta * nobs)
/usr/local/lib/python3.6/dist-packages/statsmodels/nonparametric/kdetools.py:34: RuntimeWarning: invalid value encountered in double_scalars
  FAC1 = 2*(np.pi*bw/RANGE)**2
```




```
#Cambiamos el tipo de gráfico para que se parezca al gráfico de la presntación
```

```
#Define un subconjuto de datos con las variables numéricas (cuantitativas)
titanic_num = titanic[['survived','pclass','sibsp','parch','fare']]
#Hace una matriz de diagramas de dispersión de parejas de variables.
g = sns.PairGrid(titanic_num,hue="survived", palette="husl")
g.map_diag(plt.hist)
g.map_offdiag(plt.scatter)
g.add_legend()
```

<seaborn.axisgrid.PairGrid at 0x7f331ae98d30>

Gráficos Dataset IRIS

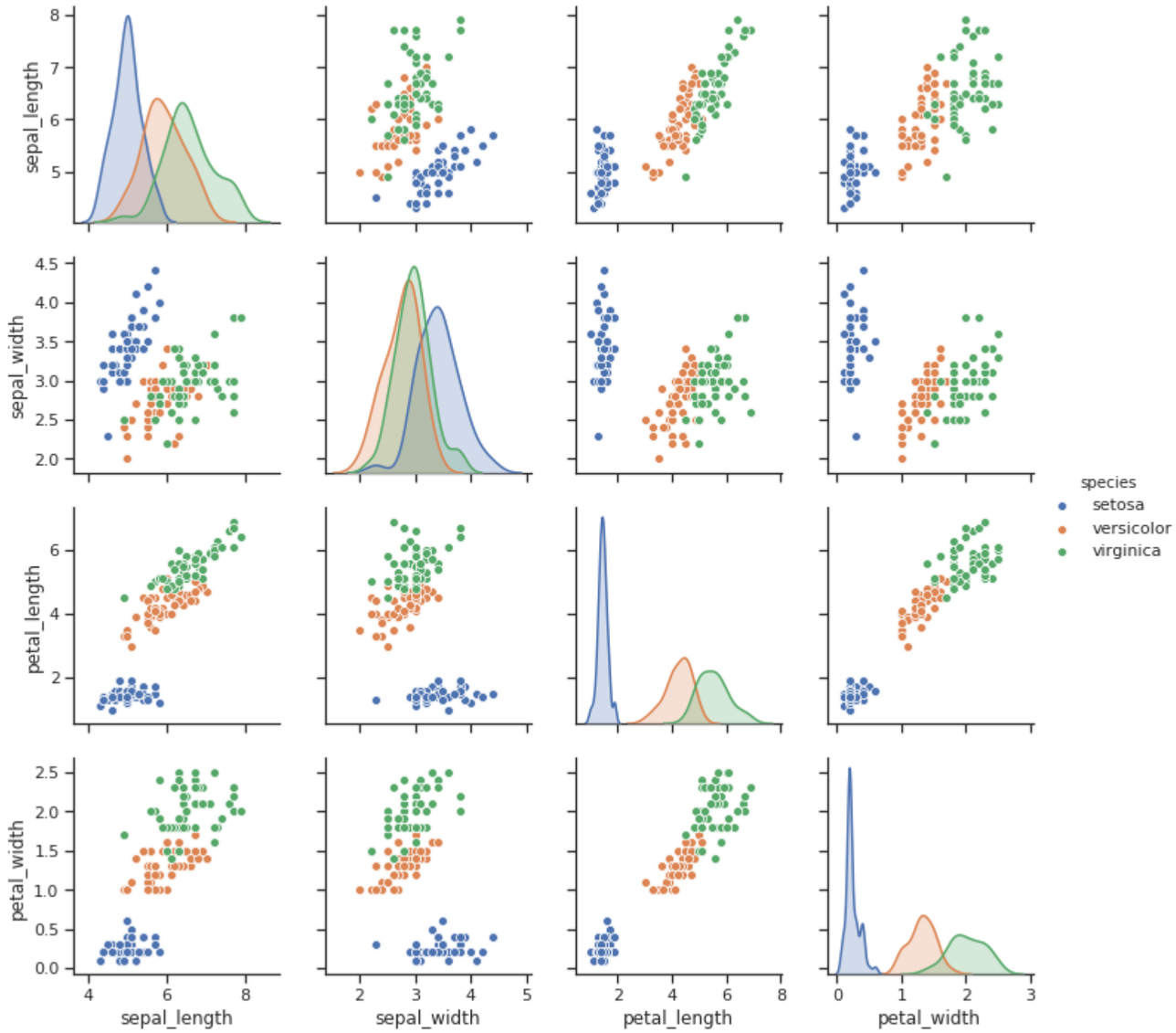
```
df = sns.load_dataset("iris")
df
```

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa
...	...	...	...	...	...
145	6.7	3.0	5.2	2.3	virginica
146	6.3	2.5	5.0	1.9	virginica
147	6.5	3.0	5.2	2.0	virginica
148	6.2	3.4	5.4	2.3	virginica
149	5.9	3.0	5.1	1.8	virginica

150 rows × 5 columns

```
#Establece el estilo estético de las tramas
sns.set(style="ticks")
#Carga el data set
df = sns.load_dataset("iris")
#matriz de diagramas de dispersion
sns.pairplot(df, hue="species")
```

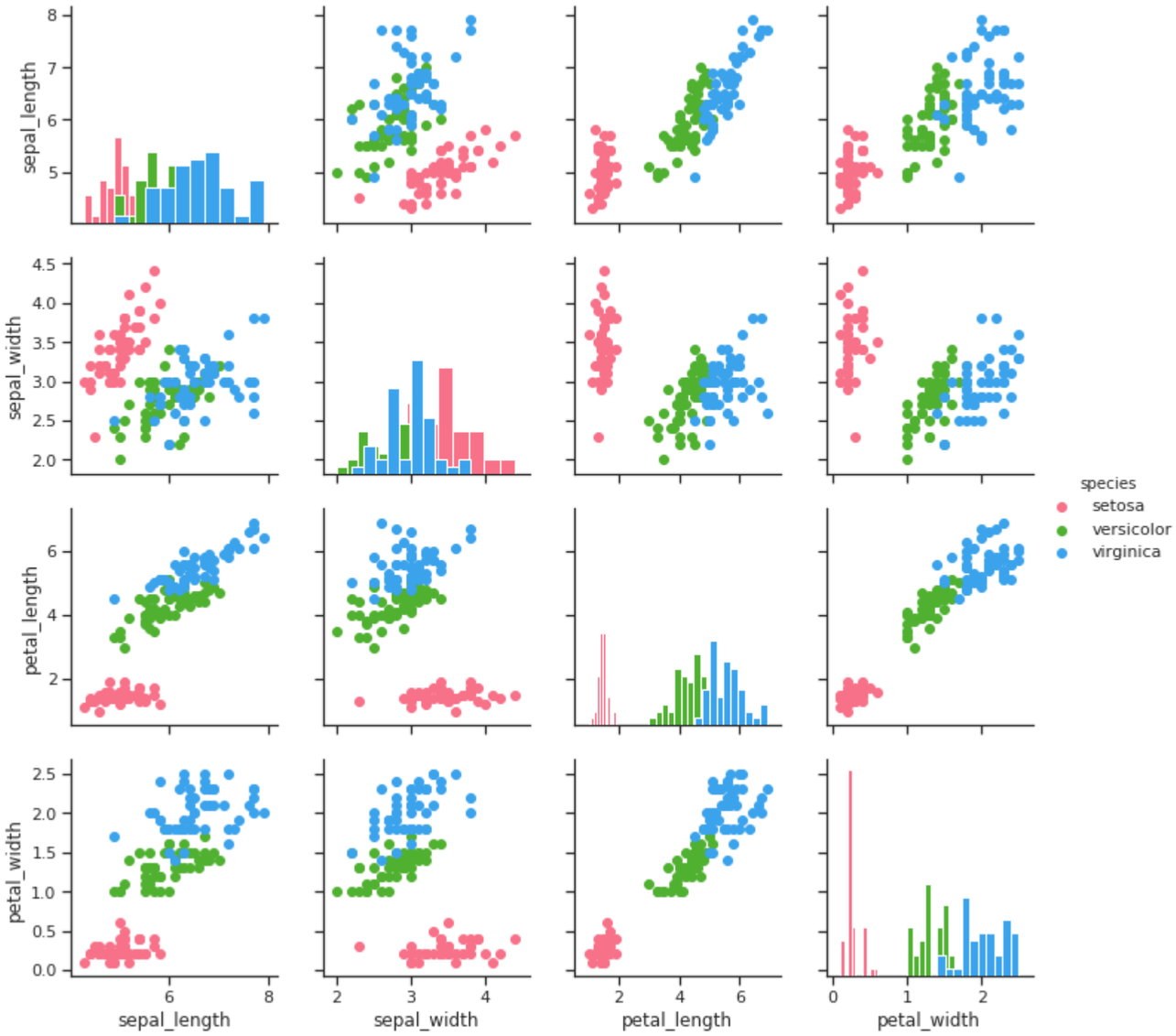
```
<seaborn.axisgrid.PairGrid at 0x7f331ab41ef0>
```



Diferentes formatos de gráfico del Dataset IRIS

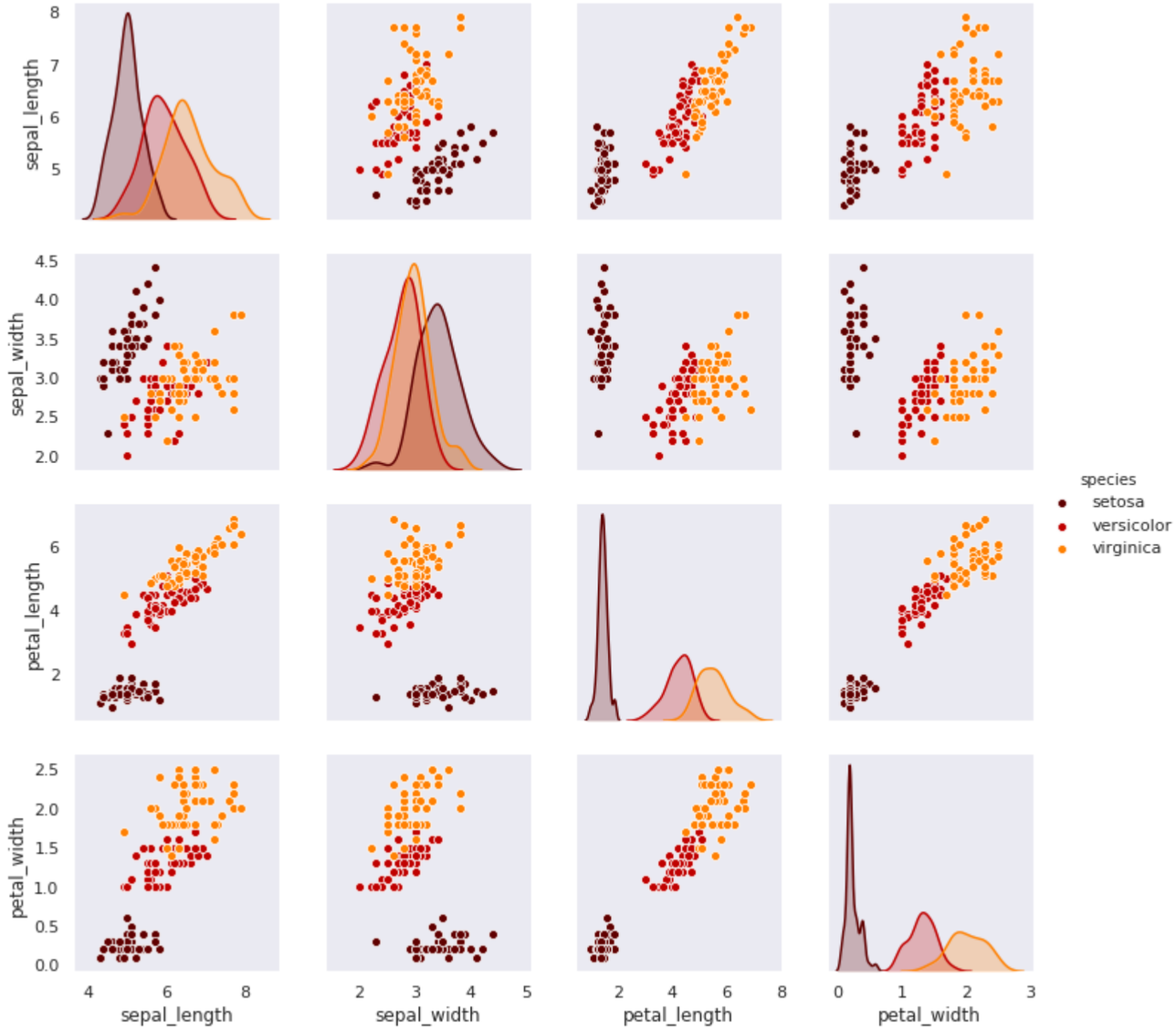
```
g = sns.PairGrid(df,hue="species", palette="husl")
g.map_diag(plt.hist)
g.map_offdiag(plt.scatter)
g.add_legend()
```

```
<seaborn.axisgrid.PairGrid at 0x7f331a1f2f60>
```



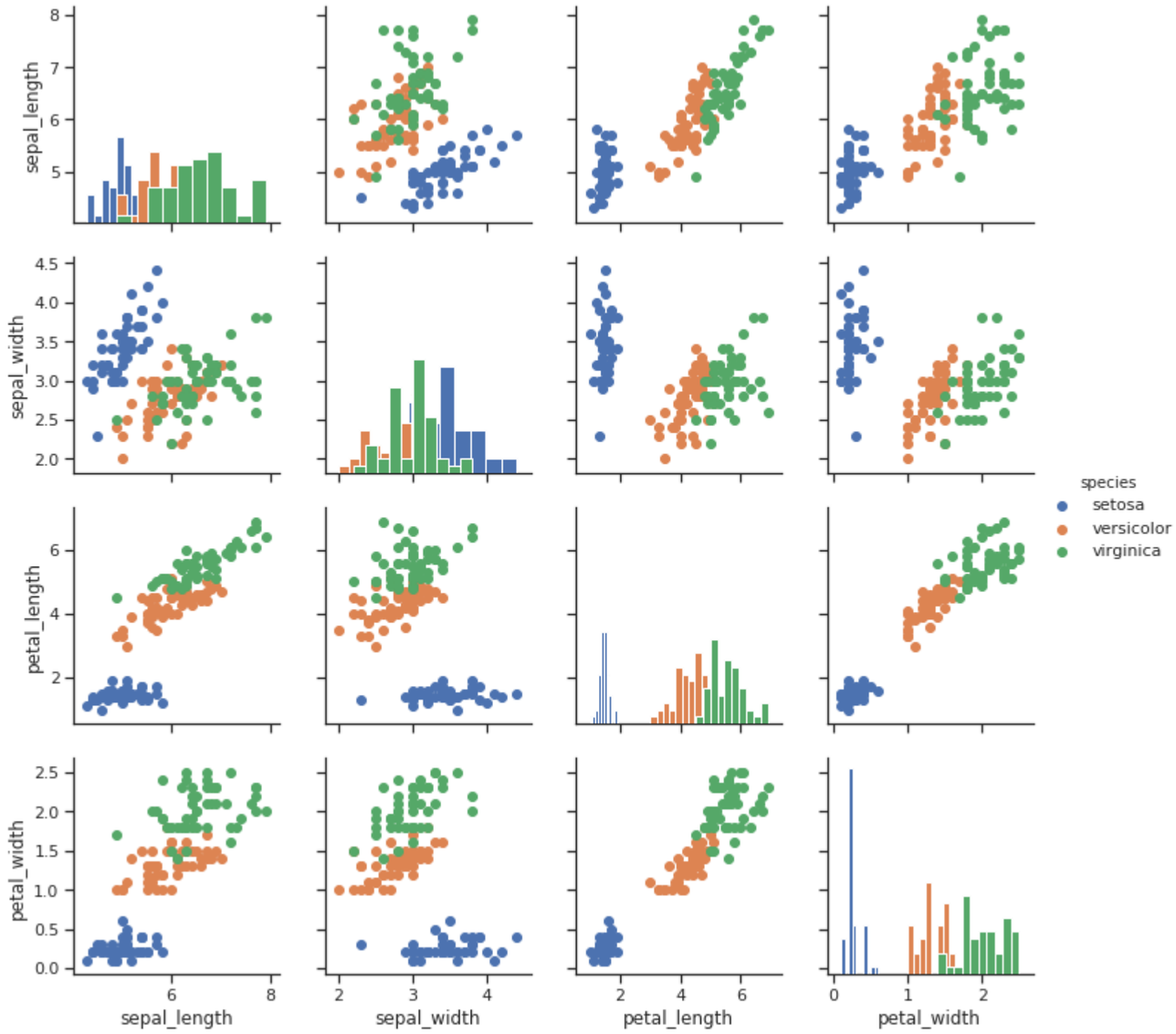

```
df = sns.load_dataset('iris') # temporarily using a different dataset for this one
sns.pairplot(df, palette='Blues', hue='species')
sns.plt.show()
```

<seaborn.axisgrid.PairGrid at 0x7f3321ec1ba8>




```
g = sns.PairGrid(df, hue="species")
g.map_diag(plt.hist)
g.map_offdiag(plt.scatter)
g.add_legend()
```

```
<seaborn.axisgrid.PairGrid at 0x7f331b5e7710>
```



Python. Ampliación de la Práctica (10/10)

Diagramas de distribución de clase/edad y supervivientes

```
# Diagramas de distribución de clase/edad y supervivientes
import numpy as np
bins = np.arange(0, 80, 5)
g = sns.FacetGrid(titanic, row='sex', col='pclass', hue='survived', margin_titles=True, size=3, aspect=1.1)
g.map(sns.distplot, 'age', kde=False, bins=bins, hist_kws=dict(alpha=0.6))
g.add_legend()
plt.show()
```

```
/usr/local/lib/python3.6/dist-packages/seaborn/axisgrid.py:230: UserWarning: The `size` paramter has been renamed to `height`; please update your code.
  warnings.warn(msg, UserWarning)
```