```
from google.colab import drive
drive.mount('/content/drive')
import pandas as pd
import numpy as np
import math
import pylab as plt

%matplotlib inline
```

```
Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.m
```

```
train_data = pd.read_csv('/content/drive/My Drive/kaggle-titanic/train.csv')
test_data = pd.read_csv('/content/drive/My Drive/kaggle-titanic/test.csv')
p_id = test_data['PassengerId']
data = pd.concat([train_data, test_data])
data.shape
```

```
(1309, 12)
```

```
print(train_data.isnull().any())
print()
```

```
PassengerId    False
Survived       False
Pclass         False
Name           False
Sex            False
Age             True
SibSp          False
Parch          False
Ticket         False
Fare           False
Cabin           True
Embarked        True
dtype: bool
```

```
print(train_data.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 12 columns):
 #   Column       Non-Null Count  Dtype  
---  ------       --------------  -----  
 0   PassengerId  891 non-null    int64  
 1   Survived     891 non-null    int64  
 2   Pclass       891 non-null    int64  
 3   Name         891 non-null    object 
 4   Sex          891 non-null    object 
 5   Age          714 non-null    float64
 6   SibSp        891 non-null    int64  
 7   Parch        891 non-null    int64  
 8   Ticket       891 non-null    object 
```

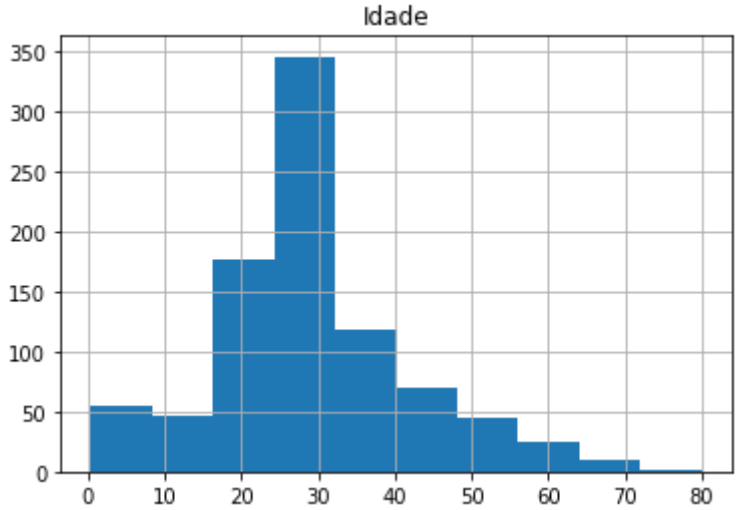
```
 9   Fare         891 non-null    float64
 10  Cabin        204 non-null    object
 11  Embarked     889 non-null    object
dtypes: float64(2), int64(5), object(5)
memory usage: 83.7+ KB
None
```

```
train_data['Cabin'].fillna('NotFClass', inplace=True)
train_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 12 columns):
 #   Column       Non-Null Count  Dtype
---  ------       --------------  -----
 0   PassengerId  891 non-null    int64
 1   Survived     891 non-null    int64
 2   Pclass       891 non-null    int64
 3   Name         891 non-null    object
 4   Sex          891 non-null    object
 5   Age          714 non-null    float64
 6   SibSp        891 non-null    int64
 7   Parch        891 non-null    int64
 8   Ticket       891 non-null    object
 9   Fare         891 non-null    float64
 10  Cabin        891 non-null    object
 11  Embarked     889 non-null    object
dtypes: float64(2), int64(5), object(5)
memory usage: 83.7+ KB
```

```
media_idade = train_data['Age'].mean()
train_data['Age'].fillna(media_idade, inplace=True)
train_data['Age'].hist()
plt.title('Idade')
```

```
Text(0.5, 1.0, 'Idade')
```




```
train_data['Embarked'].fillna('S', inplace=True)
train_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
```

```
RangeIndex: 891 entries, 0 to 890
Data columns (total 12 columns):
 #   Column       Non-Null Count  Dtype  
---  ------       --------------  -----  
 0   PassengerId  891 non-null    int64  
 1   Survived     891 non-null    int64  
 2   Pclass       891 non-null    int64  
 3   Name         891 non-null    object 
 4   Sex          891 non-null    object 
 5   Age          891 non-null    float64
 6   SibSp        891 non-null    int64  
 7   Parch        891 non-null    int64  
 8   Ticket       891 non-null    object 
 9   Fare         891 non-null    float64
 10  Cabin        891 non-null    object 
 11  Embarked     891 non-null    object 
dtypes: float64(2), int64(5), object(5)
memory usage: 83.7+ KB
```

```
train_data.to_csv('lab2_train_no_nulls.csv', index=False)
```

```
df_train = pd.read_csv('lab2_train_no_nulls.csv')
```

```
df_train.describe()
```

	PassengerId	Survived	Pclass	Age	SibSp	Parch	F
count	891.000000	891.000000	891.000000	891.000000	891.000000	891.000000	891.000
mean	446.000000	0.383838	2.308642	29.699118	0.523008	0.381594	32.204
std	257.353842	0.486592	0.836071	13.002015	1.102743	0.806057	49.693
min	1.000000	0.000000	1.000000	0.420000	0.000000	0.000000	0.000
25%	223.500000	0.000000	2.000000	22.000000	0.000000	0.000000	7.910
50%	446.000000	0.000000	3.000000	29.699118	0.000000	0.000000	14.454
75%	668.500000	1.000000	3.000000	35.000000	1.000000	0.000000	31.000
max	891.000000	1.000000	3.000000	80.000000	8.000000	6.000000	512.329

```
print(df_train.sort_values('Age', ascending=False).head(5)['Age'])
print(df_train.sort_values('Age', ascending=True).head(5)['Age'])
```

```
630    80.0
851    74.0
96     71.0
493    71.0
116    70.5
Name: Age, dtype: float64
803    0.42
755    0.67
644    0.75
469    0.75
```

```
831    0.83
Name: Age, dtype: float64
```

```
print(df_train.sort_values('Fare', ascending=False).head(5)['Fare'])
print(df_train.sort_values('Fare', ascending=True).head(5)['Fare'])
```

```
258    512.3292
737    512.3292
679    512.3292
88     263.0000
27     263.0000
Name: Fare, dtype: float64
271    0.0
597    0.0
302    0.0
633    0.0
277    0.0
Name: Fare, dtype: float64
```

```
df_train.to_csv('train_no_nulls_no_outliers.csv', index=False)
```

```
df_train = pd.read_csv('train_no_nulls_no_outliers.csv')
df_train.head(2)
```

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Far
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.250

```
novas_colunas = pd.get_dummies(df_train['Embarked'])
df_train2 = pd.concat([df_train,novas_colunas], axis=1) # axis = 1 concatena colunas. axis
df_train2.head(3)
```

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171
				Cumings,					

```
df_train2.drop('Embarked', axis=1, inplace=True)
```

```
novas_colunas_pclass = pd.get_dummies(df_train['Pclass'])
novas_colunas_sex = pd.get_dummies(df_train['Sex'])

df_train3 = pd.concat([df_train2,novas_colunas_pclass, novas_colunas_sex], axis=1)
df_train3.drop(['Pclass', 'Sex'], axis=1, inplace=True)
df_train3.head(3)
```

	PassengerId	Survived	Name	Age	SibSp	Parch	Ticket	Fare	Cab
0	1	0	Braund, Mr. Owen Harris	22.0	1	0	A/5 21171	7.2500	NotFCla

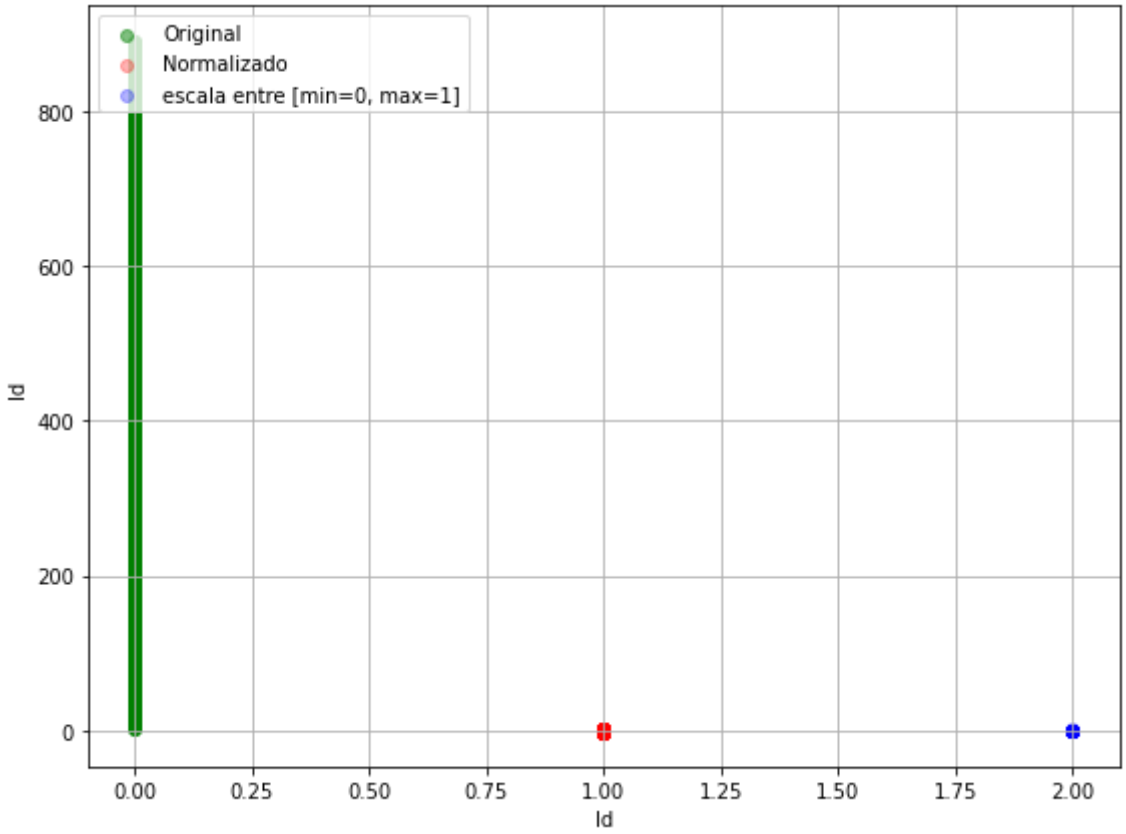
```
df_train3.to_csv('train_no_nulls_no_outliers_ohe.csv', index=False)
```

```
df_train3.to_csv('train_no_nulls_no_outliers_feat_hash.csv', index=False)
```

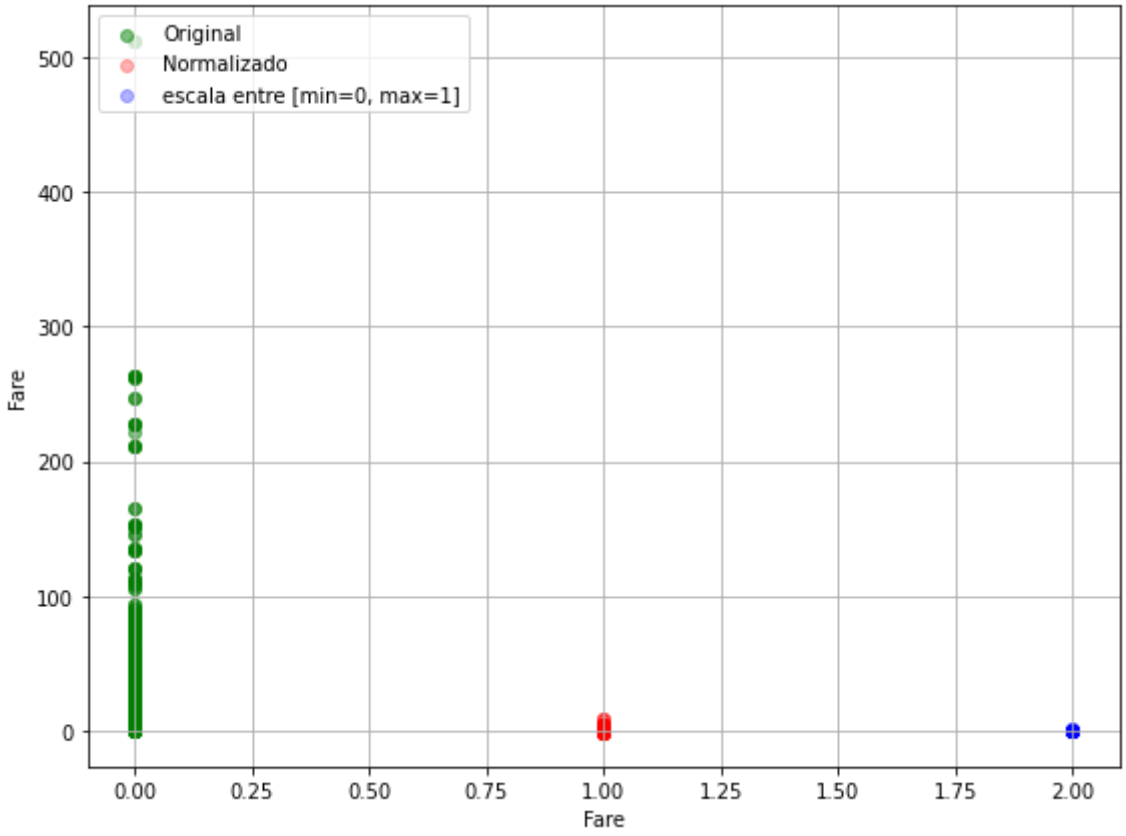
```
df_train = pd.read_csv('train_no_nulls_no_outliers_feat_hash.csv')
df_train.head(2)
```

	PassengerId	Survived	Name	Age	SibSp	Parch	Ticket	Fare	Cabin
0	1	0	Braund, Mr. Owen Harris	22.0	1	0	A/5 21171	7.2500	NotFClass

```
from sklearn import preprocessing

## dados originais
ID_original = df_train['PassengerId'].values.reshape(-1, 1)
## Normaliza os dados
ID_standard = preprocessing.StandardScaler().fit_transform(df_train['PassengerId'].values.
## Muda a escala dos dados para valores entre 0 e 1 (valores padrão, que poderiam ser pers
ID_minmax = preprocessing.MinMaxScaler().fit_transform(df_train['PassengerId'].values.resh


from matplotlib import pyplot as plt

def plot():
    plt.figure(figsize=(8,6))

    plt.scatter([0]*len(ID_original), ID_original,
            color='green', label='Original', alpha=0.5)

    plt.scatter([1]*len(ID_standard), ID_standard, color='red',
            label='Normalizado', alpha=0.3)

    plt.scatter([2]*len(ID_minmax), ID_minmax,
            color='blue', label='escala entre [min=0, max=1]', alpha=0.3)

    plt.xlabel('Id')
    plt.ylabel('Id')
    plt.legend(loc='upper left')
    plt.grid()

    plt.tight_layout()

plot()
plt.show()
```




```
## dados originais
Fare_original = df_train['Fare'].values.reshape(-1, 1)
## Normaliza os dados
Fare_standard = preprocessing.StandardScaler().fit_transform(df_train['Fare'].values.resha
## Muda a escala dos dados para valores entre 0 e 1 (valores padrão, que poderiam ser pers
Fare_minmax = preprocessing.MinMaxScaler().fit_transform(df_train['Fare'].values.reshape(-


from matplotlib import pyplot as plt

def plot():
    plt.figure(figsize=(8,6))

    plt.scatter([0]*len(Fare_original), Fare_original,
            color='green', label='Original', alpha=0.5)

    plt.scatter([1]*len(Fare_original), Fare_standard, color='red',
            label='Normalizado', alpha=0.3)

    plt.scatter([2]*len(Fare_original), Fare_minmax,
            color='blue', label='escala entre [min=0, max=1]', alpha=0.3)

    plt.xlabel('Fare')
    plt.ylabel('Fare')
    plt.legend(loc='upper left')
    plt.grid()

    plt.tight_layout()

plot()
plt.show()
```



✓ 0s conclusão: 19:28