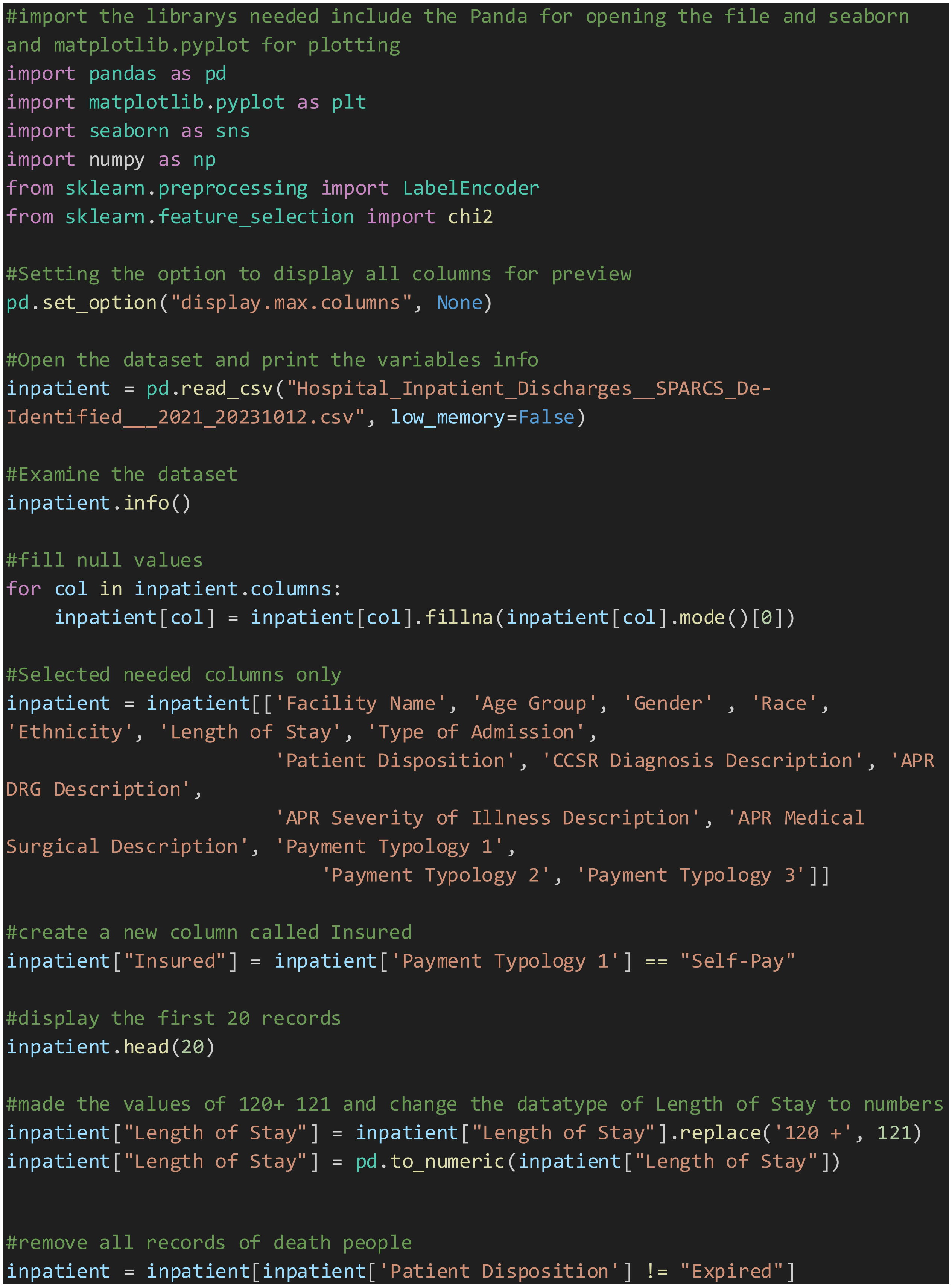
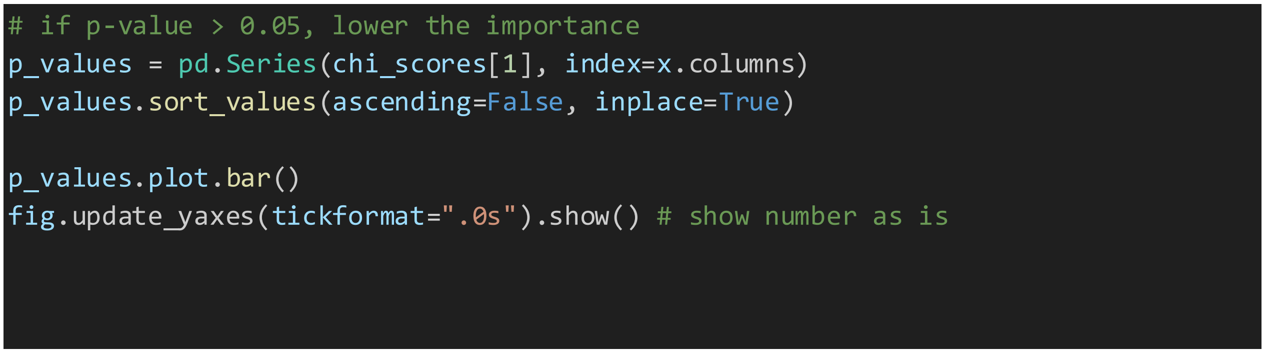


```
#import the librarys needed include the Panda for opening the file and seaborn
and matplotlib.pyplot for plotting
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import numpy as np
from sklearn.preprocessing import LabelEncoder
from sklearn.feature_selection import chi2

#Setting the option to display all columns for preview
pd.set_option("display.max.columns", None)

#Open the dataset and print the variables info
inpatient = pd.read_csv("Hospital_Inpatient_Discharges__SPARCS_De-
Identified___2021_20231012.csv", low_memory=False)

#Examine the dataset
inpatient.info()

#fill null values
for col in inpatient.columns:
    inpatient[col] = inpatient[col].fillna(inpatient[col].mode()[0])

#Selected needed columns only
inpatient = inpatient[['Facility Name', 'Age Group', 'Gender' , 'Race',
'Ethnicity', 'Length of Stay', 'Type of Admission',
                       'Patient Disposition', 'CCSR Diagnosis Description', 'APR
DRG Description',
                       'APR Severity of Illness Description', 'APR Medical
Surgical Description', 'Payment Typology 1',
                           'Payment Typology 2', 'Payment Typology 3']]

#create a new column called Insured
inpatient["Insured"] = inpatient['Payment Typology 1'] == "Self-Pay"

#display the first 20 records
inpatient.head(20)

#made the values of 120+ 121 and change the datatype of Length of Stay to numbers
inpatient["Length of Stay"] = inpatient["Length of Stay"].replace('120 +', 121)
inpatient["Length of Stay"] = pd.to_numeric(inpatient["Length of Stay"])


#remove all records of death people
inpatient = inpatient[inpatient['Patient Disposition'] != "Expired"]
```

```
#show the summary descriptive values of the column Length of stay
inpatient['Length of Stay'].describe()

# check the distribution of the Length of stay variable
plt.figure(figsize=(10, 6))
sns.histplot(data=inpatient, x='Length of Stay', bins = 50)
plt.title('Distribution of Length of Stay')
plt.ylabel('Count')
plt.grid(True)
plt.show()

#Distribution of the length of stay by payment typology
ax=sns.barplot(x="Payment Typology 1", y="Length of Stay", data=inpatient,
errorbar=None)
ax.bar_label(ax.containers[0], fontsize=10);
plt.xticks(rotation=90)
plt.title('Length of Stay vs. Primary Payment')
plt.show()

#creating a crosstab table
inpatient_tab = pd.crosstab(inpatient['Length of Stay'], inpatient['Insured'],
margins = True)
inpatient_tab

# label encoding
for col in inpatient.columns:
    inpatient_le = LabelEncoder()
    inpatient[col] = inpatient_le.fit_transform(inpatient[col])
inpatient.head()


x = inpatient.drop(columns=['Length of Stay'], axis=1)
y = inpatient['Length of Stay']
chi_scores = chi2(x, y)
chi_scores

pd.options.plotting.backend = "plotly"
#a plot of the chi_scores,  higher the chi value, higher the importance
chi_values = pd.Series(chi_scores[0], index=x.columns)
chi_values.sort_values(ascending=False, inplace=True)
fig = chi_values.plot.bar()
fig.update_yaxes(tickformat=".0s").show() # show number as is
```



```
# if p-value > 0.05, lower the importance
p_values = pd.Series(chi_scores[1], index=x.columns)
p_values.sort_values(ascending=False, inplace=True)

p_values.plot.bar()
fig.update_yaxes(tickformat=".0s").show() # show number as is
```