# 1

import pandas as pd

# 2

df = pd.read\_csv('medical\_examination.csv')

# 3

df['overweight'] = (df['weight'] / ((df['height'] / 100) \*\* 2) > 25).astype(int)

# 4

df['cholesterol'] = (df['cholesterol'] > 1).astype(int)

df['gluc'] = (df['gluc'] > 1).astype(int)

# 5

def draw\_cat\_plot():

# 6

df\_cat = pd.melt(df, id\_vars=['cardio'], value\_vars=['cholesterol', 'gluc', 'smoke', 'alco', 'active', 'overweight'])

# 7

df\_cat['total'] = 1

df\_cat = df\_cat.groupby(['cardio', 'variable', 'value'], as\_index=False).count()

# 8

import seaborn as sns

import matplotlib.pyplot as plt

g = sns.catplot(data=df\_cat, kind="bar", x="variable", y="total", hue="value", col="cardio")

fig = g.fig

# 9

return fig

# 10

def draw\_heat\_map():

# 11

df\_heat = df[

(df['height'] >= df['height'].quantile(0.025)) &

(df['height'] <= df['height'].quantile(0.975)) &

(df['weight'] >= df['weight'].quantile(0.025)) &

(df['weight'] <= df['weight'].quantile(0.975)) &

(df['ap\_lo'] <= df['ap\_hi'])

]

# 12

corr = df\_heat.corr()

# 13

mask = 1 - np.triu(np.ones\_like(corr))

# 14

plt.figure(figsize=(12, 8))

sns.heatmap(corr, annot=True, fmt='.1f', cmap='coolwarm', mask=mask, linewidths=0.5)

plt.title('Correlation Matrix Heatmap')

# 15

return plt.gcf()