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

```
# Read in all the filenames from the JPEG directory
import os, glob, pandas, numpy, PIL, sklearn.cluster, sklearn.ensemble, sklearn.tree, sklearn.linear_model,
sklearn.metrics, sklearn.model_selection
dirfilenames = [x for x in sorted(glob.glob("./*.jpg", recursive=True))]
print(len(dirfilenames), "images read from directory.")
```

```
# Read all images into a numpy array, and print the shape
allimages = []
for i in range(len(dirfilenames)):
    ...
    if (i % 100 == 0):
        print("Read image", i, "...")
    ...
    allimages.append(...)
allimages = numpy.array(allimages)
print("Shape of all images:", allimages.shape)
```

```
# Find and print the dimensions of the first image
firstimg = allimages[0]
print("Dimensions of first image:", firstimg.shape)
```

```
# Create a 2x3 grid of subplots, and show the first 6 images
fig, axs = plt.subplots(2, 3, sharex=False, sharey=False)
axs[0,0].imshow(allimages[0])
axs[0,1].imshow(allimages[1])
axs[0,2].imshow(allimages[2])
axs[1,0].imshow(allimages[3])
axs[1,1].imshow(allimages[4])
axs[1,2].imshow(allimages[5])
```

```
# Create a 2x3 grid of subplots, and show the last 6 images
fig, axs = plt.subplots(2, 3, sharex=False, sharey=False)
axs[0,0].imshow(allimages[-6])
axs[0,1].imshow(allimages[-5])
axs[0,2].imshow(allimages[-4])
axs[1,0].imshow(allimages[-3])
axs[1,1].imshow(allimages[-2])
axs[1,2].imshow(allimages[-1])
```

```
# Create a 2x3 grid of subplots, and show 6 random images
fig, axs = plt.subplots(2, 3, sharex=False, sharey=False)
axs[0,0].imshow(allimages[numpy.random.randint(len(allimages))])
axs[0,1].imshow(allimages[numpy.random.randint(len(allimages))])
axs[0,2].imshow(allimages[numpy.random.randint(len(allimages))])
axs[1,0].imshow(allimages[numpy.random.randint(len(allimages))])
axs[1,1].imshow(allimages[numpy.random.randint(len(allimages))])
axs[1,2].imshow(allimages[numpy.random.randint(len(allimages))
```

Sex
Female
Male
Smoking
Smoking Yes
Smoking No
Age
Cholesterol