In [5]:
```python
import pandas as pd
import matplotlib.pyplot as plt
```

In [6]:
```python
df=pd.read_csv("Heart.csv")
```

In [7]:
```python
print(df.head(3))
```

```
   ID  Age  Sex      ChestPain  RestBP  Chol  Fbs  RestECG  MaxHR  ExAng  \
0   1   63    1        typical     145   233    1        2    150      0
1   2   67    1   asymptomatic     160   286    0        2    108      1
2   3   67    1   asymptomatic     120   229    0        2    129      1

   Oldpeak  Slope   Ca        Thal  AHD
0      2.3      3  0.0       fixed   No
1      1.5      2  3.0      normal  Yes
2      2.6      2  2.0  reversable  Yes
```

In [8]:
```python
print("Below are the features of dataset")
df.info()
```

```
Below are the features of dataset
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 303 entries, 0 to 302
Data columns (total 15 columns):
 #   Column     Non-Null Count  Dtype
---  ------     --------------  -----
 0   ID         303 non-null    int64
 1   Age        303 non-null    int64
 2   Sex        303 non-null    int64
 3   ChestPain  303 non-null    object
 4   RestBP     303 non-null    int64
 5   Chol       303 non-null    int64
 6   Fbs        303 non-null    int64
 7   RestECG    303 non-null    int64
 8   MaxHR      303 non-null    int64
 9   ExAng      303 non-null    int64
 10  Oldpeak    303 non-null    float64
 11  Slope      303 non-null    int64
 12  Ca         299 non-null    float64
 13  Thal       301 non-null    object
 14  AHD        303 non-null    object
dtypes: float64(2), int64(10), object(3)
memory usage: 35.6+ KB
```

In [10]:
```python
print("below are the dimensions of dataset")
print("Number of rows in the dataset", df.shape[0])
print("Number of cols in the dataset", df.shape[1])
```

```
below are the dimensions of dataset
Number of rows in the dataset 303
Number of cols in the dataset 15
```

In [11]:
```python
print("checking for null values in the dataset")
print(df.isnull().sum())
```

```
checking for null values in the dataset
ID           0
Age          0
Sex          0
ChestPain    0
RestBP       0
Chol         0
Fbs          0
RestECG      0
MaxHR        0
ExAng        0
Oldpeak      0
Slope        0
Ca           4
Thal         2
AHD          0
dtype: int64
```

In [12]:
```python
print(df.describe())
```

```
                 ID          Age          Sex       RestBP         Chol          Fbs  \
count    303.000000   303.000000   303.000000   303.000000   303.000000   303.000000
mean     152.000000    54.438944     0.679868   131.689769   246.693069     0.148515
std       87.612784     9.038662     0.467299    17.599748    51.776918     0.356198
min        1.000000    29.000000     0.000000    94.000000   126.000000     0.000000
25%       76.500000    48.000000     0.000000   120.000000   211.000000     0.000000
50%      152.000000    56.000000     1.000000   130.000000   241.000000     0.000000
75%      227.500000    61.000000     1.000000   140.000000   275.000000     0.000000
max      303.000000    77.000000     1.000000   200.000000   564.000000     1.000000

            RestECG        MaxHR        ExAng      Oldpeak        Slope           Ca
count    303.000000   303.000000   303.000000   303.000000   303.000000   299.000000
mean       0.990099   149.607261     0.326733     1.039604     1.600660     0.672241
std        0.994971    22.875003     0.469794     1.161075     0.616226     0.937438
min        0.000000    71.000000     0.000000     0.000000     1.000000     0.000000
25%        0.000000   133.500000     0.000000     0.000000     1.000000     0.000000
50%        1.000000   153.000000     0.000000     0.800000     2.000000     0.000000
75%        2.000000   166.000000     1.000000     1.600000     2.000000     1.000000
max        2.000000   202.000000     1.000000     6.200000     3.000000     3.000000
```
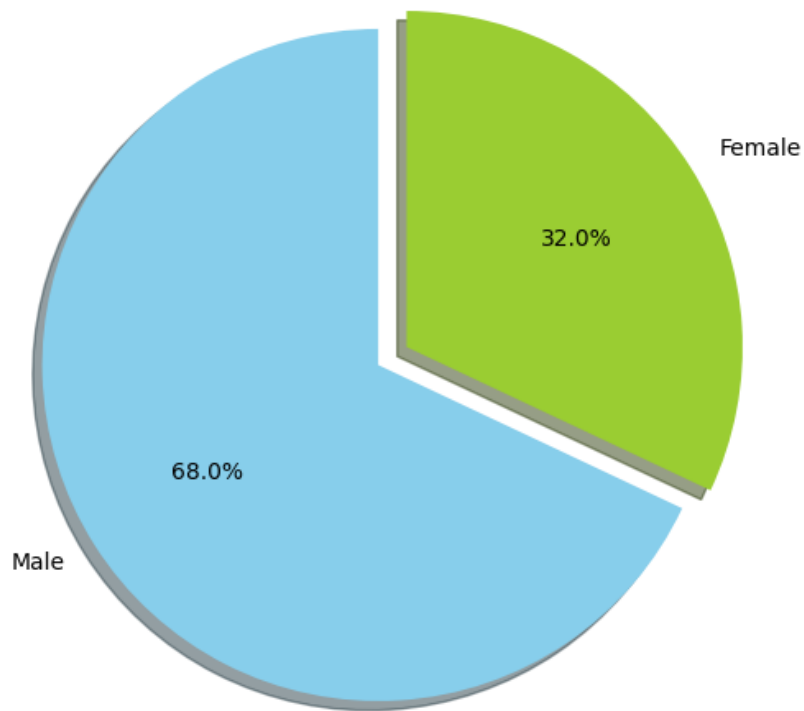
In [13]:
```python
male = len(df[df['Sex'] == 1])
female = len(df[df['Sex'] == 0])

plt.figure(figsize=(9,6))


labels = 'Male', 'Female'
sizes = [male, female]
colors = ['skyblue', 'yellowgreen']
explode = (.1,0)

plt.pie(sizes, explode=explode,labels=labels,colors=colors, autopct='%1.1f%%',sh

plt.axis('equal')
plt.show()
```
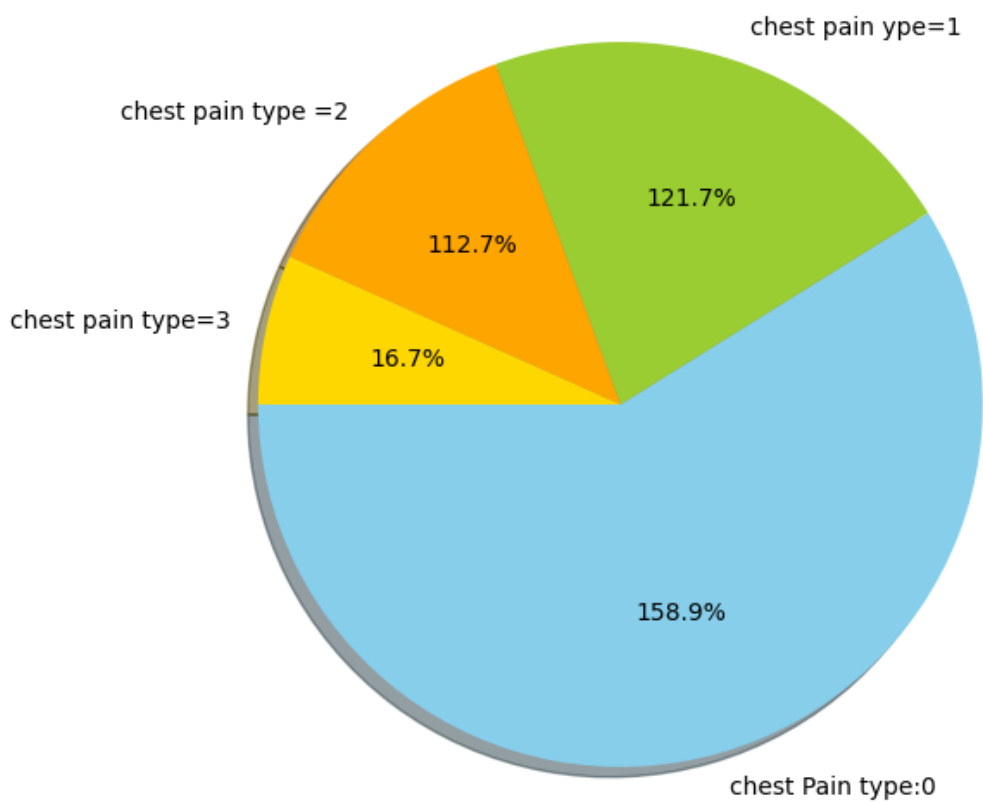
```
In [15]:  plt.figure(figsize=(8,6))
          labels ='chest Pain type:0','chest pain ype=1', 'chest pain type =2','chest pain
          sizes = [len(df[df['Ca'] ==0]),len(df[df['Ca'] ==1]),len(df[df['Ca'] ==2]),len(d
          colors = ['skyblue', 'yellowgreen','orange','gold']
          explode =(0,0,0,0)

          plt.pie(sizes,explode=explode, labels=labels, colors=colors, autopct='1%.1f%%',s
          plt.axis('equal')
          plt.show()
```

```
In [16]: plt.figure(figsize=(8,6))
         labels = 'fasting blood sugar<120mg/dl','fasting sugar>120mg/dl'
         sizes = [len(df[df['Fbs'] == 0]),len(df[df['Ca'] == 1])]
         colors = ['skyblue','yellowgreen']
         explode = (0.1,0)

         plt.pie(sizes,explode=explode,labels=labels,colors=colors,
         autopct='%1.1f%%',shadow=True,startangle=180)
         plt.axis('equal')
         plt.show()
```
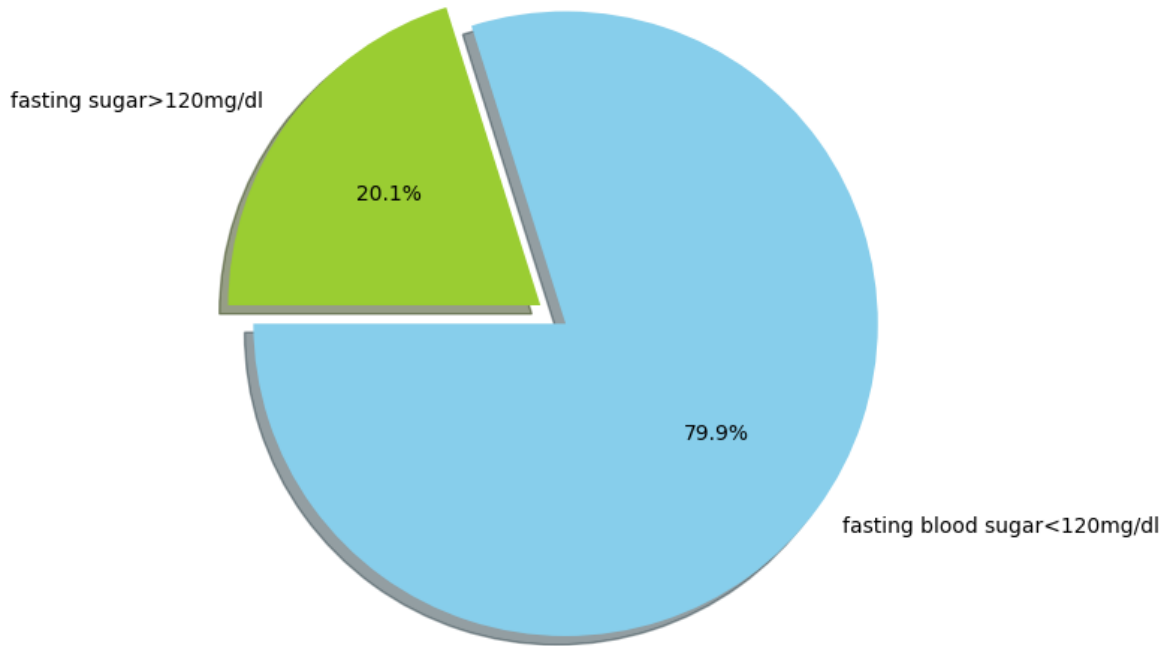


```
In [17]: plt.figure(figsize=(8,6))
         labels='NO','Yes'
         sizes=[len(df[df['ExAng'] == 0]),len(df[df['ExAng'] == 0])]
         colors=['skyblue','yellowgreen']
         explode=(0.1,0)

         plt.pie(sizes,explode=explode,labels=labels,colors=colors,autopct='%1.1f%%',shad
         plt.axis('equal')
         plt.show()
```