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

1. Load the dataset and Display first 15 rows

```
df = pd.read_excel("DoctorVisits (2).xlsx")
print(df.head(15))
```

```
    Unnamed: 0  visits  gender   age  income  illness  reduced  health
\
0            1       1  female  0.19    0.55        1        4       1
1            2       1  female  0.19    0.45        1        2       1
2            3       1    male  0.19    0.90        3        0       0
3            4       1    male  0.19    0.15        1        0       0
4            5       1    male  0.19    0.45        2        5       1
5            6       1  female  0.19    0.35        5        1       9
6            7       1  female  0.19    0.55        4        0       2
7            8       1  female  0.19    0.15        3        0       6
8            9       1  female  0.19    0.65        2        0       5
9           10       1    male  0.19    0.15        1        0       0
10          11       1    male  0.19    0.45        1        0       0
11          12       1    male  0.19    0.25        2        0       2
12          13       2    male  0.19    0.55        3       13       1
13          14       1    male  0.19    0.45        4        7       6
14          15       1    male  0.19    0.25        3        1       0


   private freepoor freerepat nchronic lchronic
0      yes       no         no       no       no
1      yes       no         no       no       no
2       no       no         no       no       no
3       no       no         no       no       no
4       no       no         no      yes       no
```

```
5        no        no         no       yes        no
6        no        no         no        no        no
7        no        no         no        no        no
8       yes        no         no        no        no
9       yes        no         no        no        no
10       no        no         no        no        no
11       no        no        yes        no        no
12       no        no         no       yes        no
13       no        no         no       yes        no
14      yes        no         no       yes        no
```

2. Display complete information about the columns of the dataset such as Column name, Count, Data type and overall memory usage

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5190 entries, 0 to 5189
Data columns (total 13 columns):
 #   Column       Non-Null Count  Dtype  
---  ------       --------------  -----  
 0   Unnamed: 0   5190 non-null   int64  
 1   visits       5190 non-null   int64  
 2   gender       5190 non-null   object 
 3   age          5190 non-null   float64
 4   income       5190 non-null   float64
 5   illness      5190 non-null   int64  
 6   reduced      5190 non-null   int64  
 7   health       5190 non-null   int64  
 8   private      5190 non-null   object 
 9   freepoor     5190 non-null   object 
 10  freerepat    5190 non-null   object 
 11  nchronic     5190 non-null   object 
 12  lchronic     5190 non-null   object 
dtypes: float64(2), int64(5), object(6)
memory usage: 527.2+ KB
```

3. Find out the total no: of people based on their count of illness

```
df["illness"].value_counts()
```

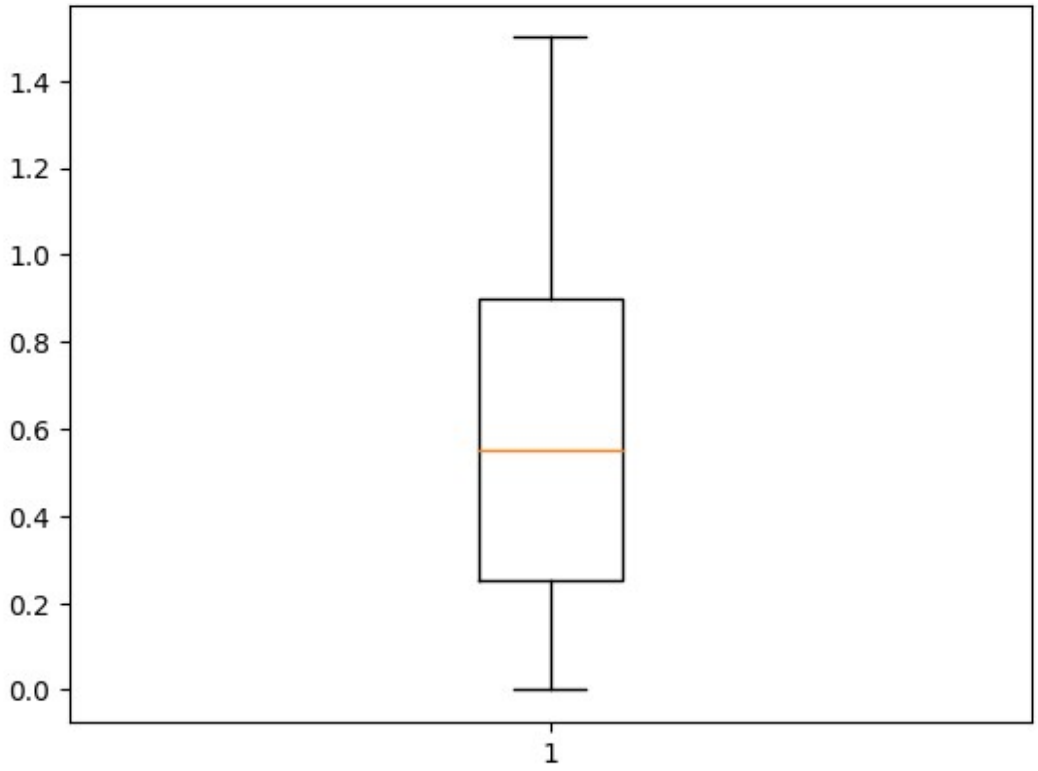
```
1    1638
0    1554
2     946
3     542
4     274
5     236
Name: illness, dtype: int64
```

```
df["gender"].value_counts()
```

```
female    2702
male      2488
Name: gender, dtype: int64
```

4. Visualize and analyse the maximum, minimum and medium income

```
y = list(df.income)
plt.boxplot(y)
plt.show()
```



5. Find out the no of days of reduced activity of male and female seperatly due to illness

```
df.groupby(['gender', 'reduced']).mean()
```

```
<ipython-input-16-40781631630e>:1: FutureWarning: The default value of
numeric_only in DataFrameGroupBy.mean is deprecated. In a future
version, numeric_only will default to False. Either specify
numeric_only or select only columns which should be valid for the
function.
  df.groupby(['gender', 'reduced']).mean()
```

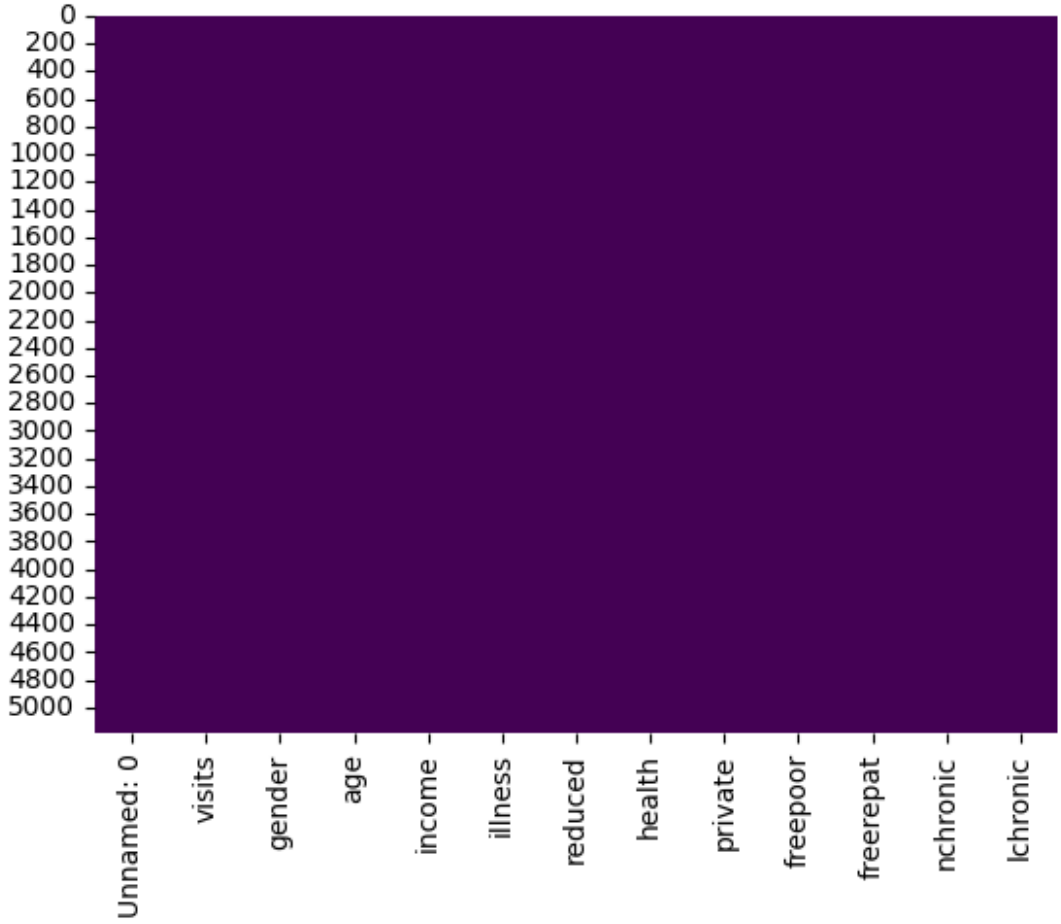
		Unnamed: 0	visits	age	income	illness	health
gender	reduced						
female	0	2524.038512	0.229322	0.465755	0.482735	1.462144	1.115098
	1	1985.768421	0.400000	0.325684	0.542105	2.242105	1.610526
	2	1622.618182	0.672727	0.391455	0.560182	2.236364	1.781818
	3	997.311111	1.333333	0.403111	0.516000	2.733333	1.733333
	4	1237.740741	0.851852	0.458889	0.466667	2.222222	2.074074
	5	1169.055556	1.444444	0.401667	0.614444	2.222222	2.500000
	6	1382.545455	1.363636	0.426364	0.622727	2.363636	1.363636
	7	1034.846154	1.384615	0.436154	0.473462	2.653846	2.230769
	8	1883.090909	1.090909	0.471818	0.404545	2.181818	4.000000
	9	1349.000000	0.500000	0.570000	0.825000	3.000000	1.000000
	10	1099.428571	2.142857	0.512857	0.421429	2.571429	2.000000
	12	1661.000000	2.000000	0.720000	0.250000	3.500000	5.500000
	13	906.000000	4.000000	0.720000	0.300000	4.500000	3.500000
	14	1392.112069	1.543103	0.551724	0.427586	2.534483	4.112069
male	0	3008.911019	0.136007	0.344703	0.694398	1.099585	0.924850
	1	2485.158537	0.304878	0.286220	0.676341	1.743902	1.256098
	2	2007.679245	0.471698	0.343585	0.653019	2.358491	

```
1.547170
       3        1909.068966  0.724138  0.334138  0.741379  2.137931
1.689655
       4        1424.000000  0.722222  0.309444  0.869444  2.055556
2.000000
       5        1437.272727  1.136364  0.331818  0.570455  2.272727
2.818182
       6         562.000000  0.833333  0.340000  0.591667  2.500000
2.000000
       7        1716.750000  0.750000  0.314167  0.655000  2.583333
4.333333
       8         680.666667  1.333333  0.365000  0.833333  2.666667
2.000000
       9        1375.400000  2.200000  0.310000  0.392000  2.400000
2.000000
       10       1543.200000  1.800000  0.480000  0.590000  2.600000
4.600000
       11        355.500000  5.000000  0.320000  1.000000  1.500000
0.500000
       12        781.500000  2.000000  0.370000  0.515000  1.500000
1.000000
       13        508.666667  4.000000  0.510000  0.350000  3.333333
2.333333
       14       1236.069444  1.555556  0.476806  0.598611  2.375000
3.527778
```

6. Visualize is there is any missing value in the dataset based based on a heat map

```
sns.heatmap(df.isnull(),cbar=False,cmap='viridis')
```

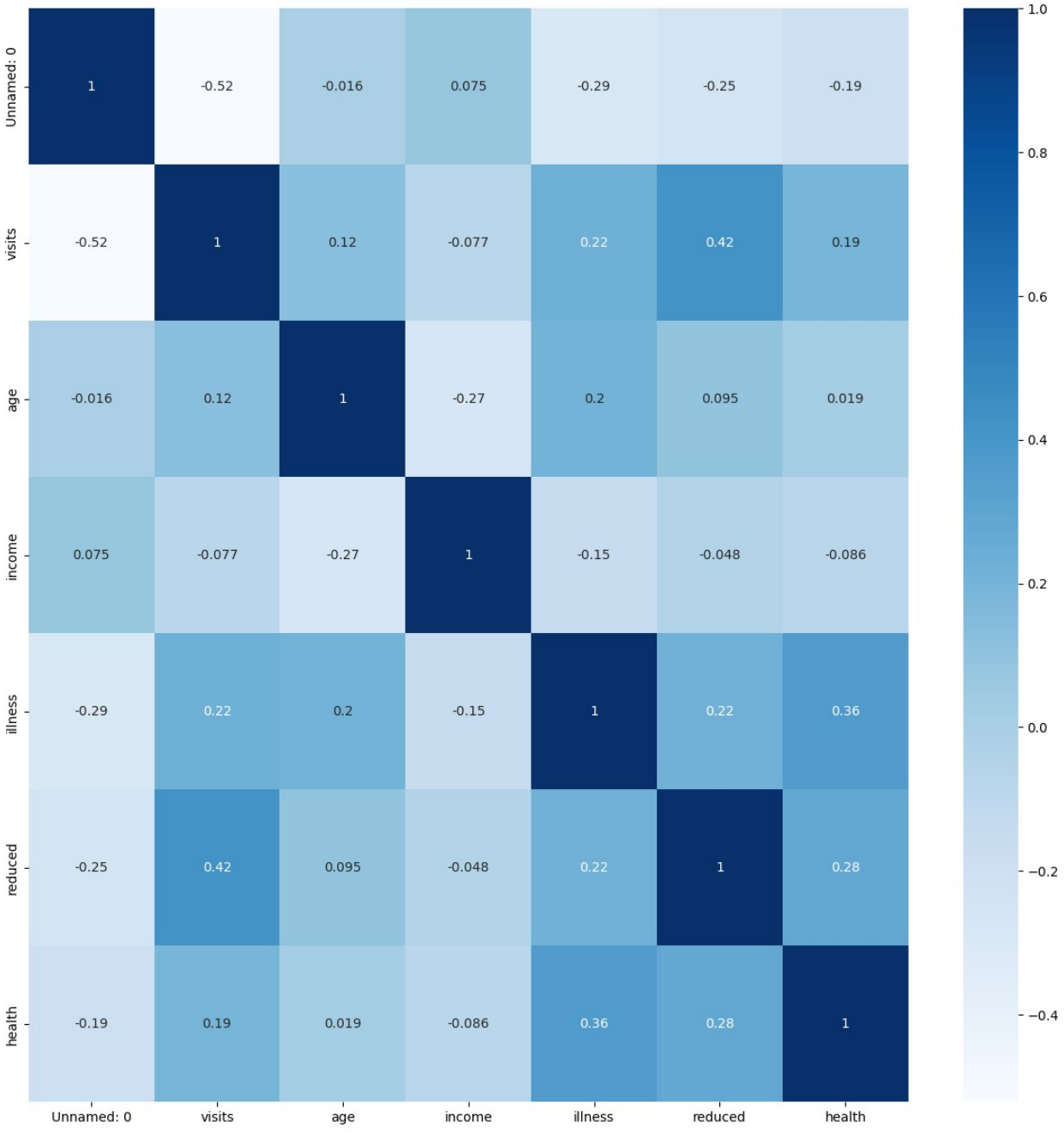
```
<Axes: >
```



7. Find out the correlation between variables in the given dataset correlation between different variables

```
plt.figure(figsize=(15,15))
sns.heatmap(df.corr(),cbar=True,annot=True,cmap='Blues')
```

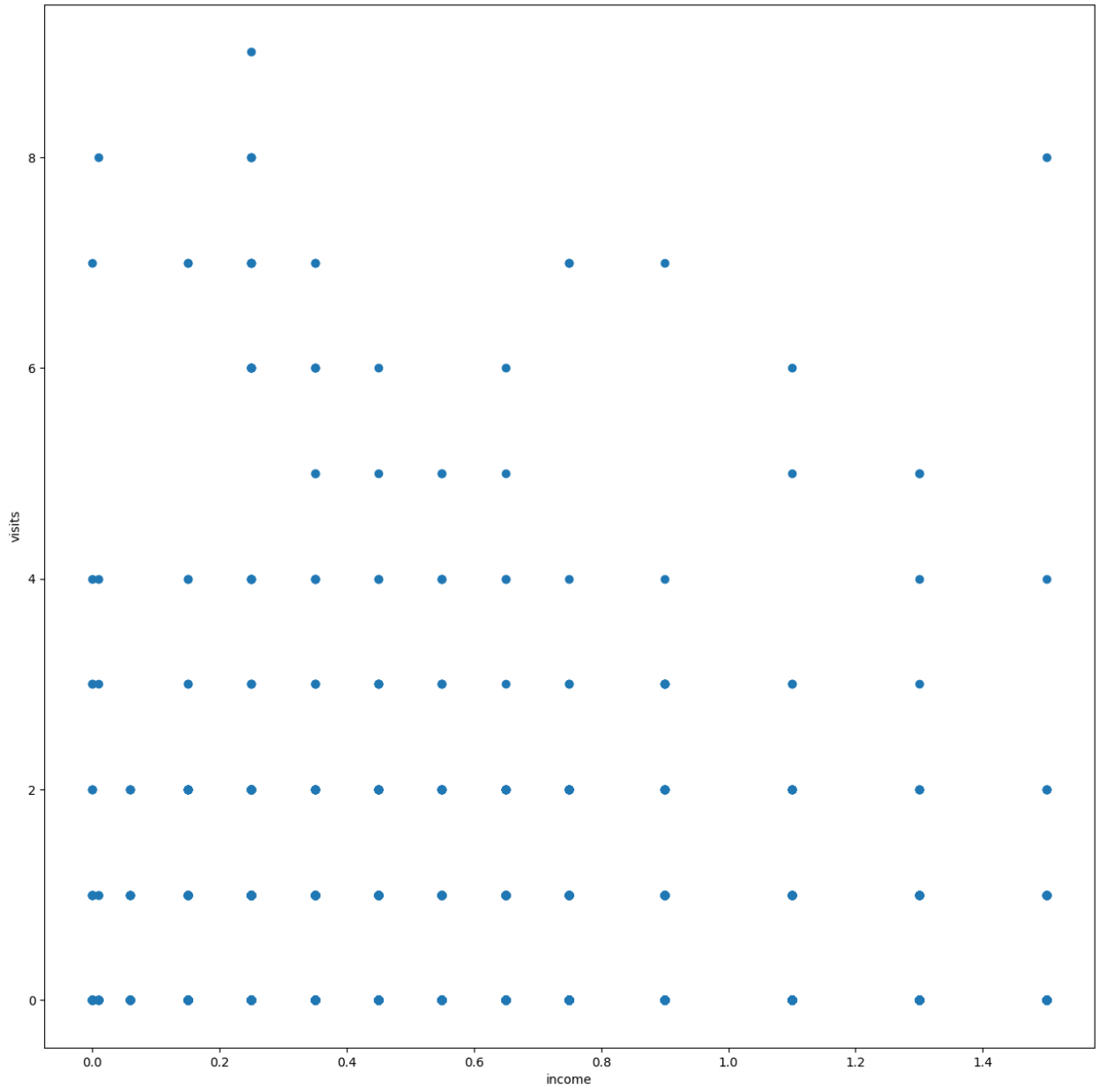
```
<ipython-input-18-545168e7e9ec>:2: FutureWarning: The default value of
numeric_only in DataFrame.corr is deprecated. In a future version, it
will default to False. Select only valid columns or specify the value
of numeric_only to silence this warning.
  sns.heatmap(df.corr(),cbar=True,annot=True,cmap='Blues')

<Axes: >
```



8. Analyse how the income of a patient affects the no of visits to the hospital

```
plt.figure(figsize=(15,15))
plt.scatter(x='income',y='visits',data=df)
plt.xlabel('income')
plt.ylabel('visits')
```

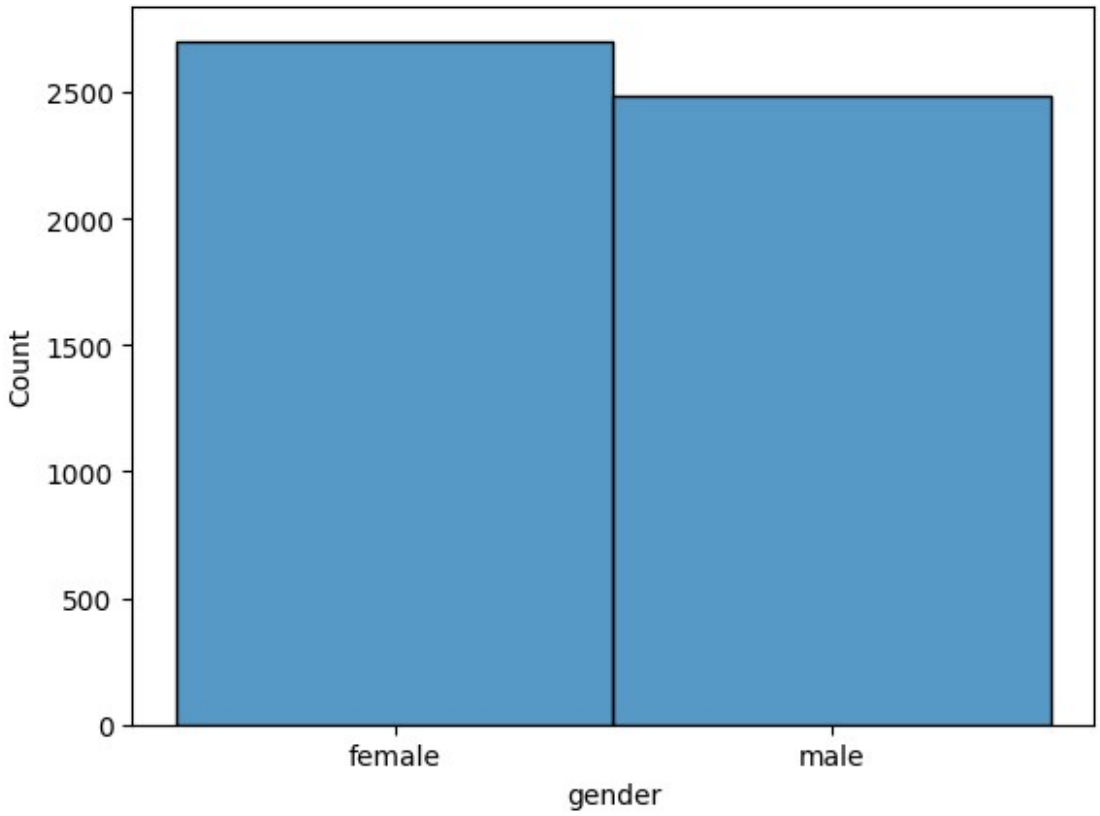
```
Text(0, 0.5, 'visits')
```



9. Count and visualize the number of males and females affected by illness

```
sns.histplot(df.gender,bins=2)
```

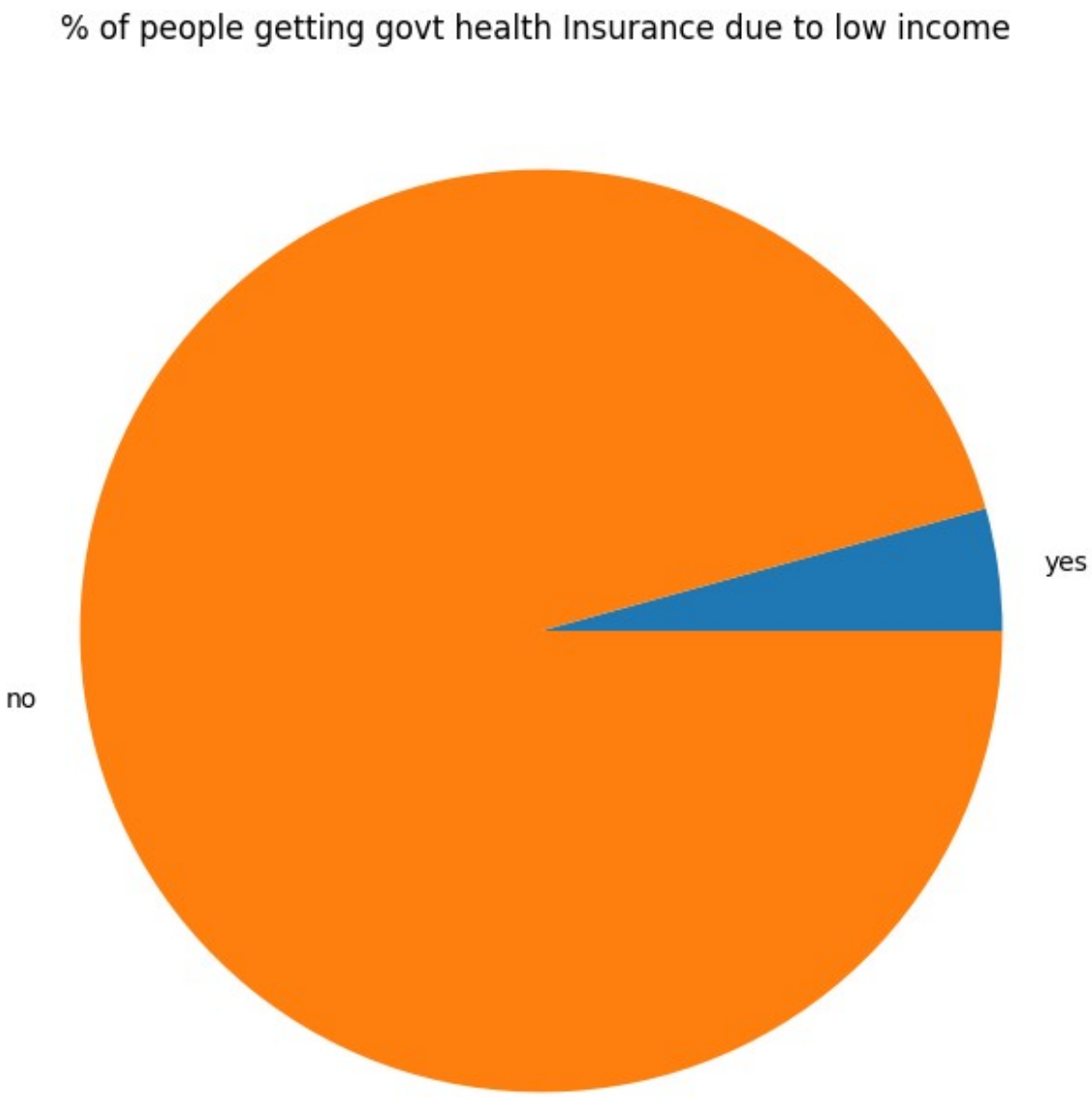
```
<Axes: xlabel='gender', ylabel='Count'>
```

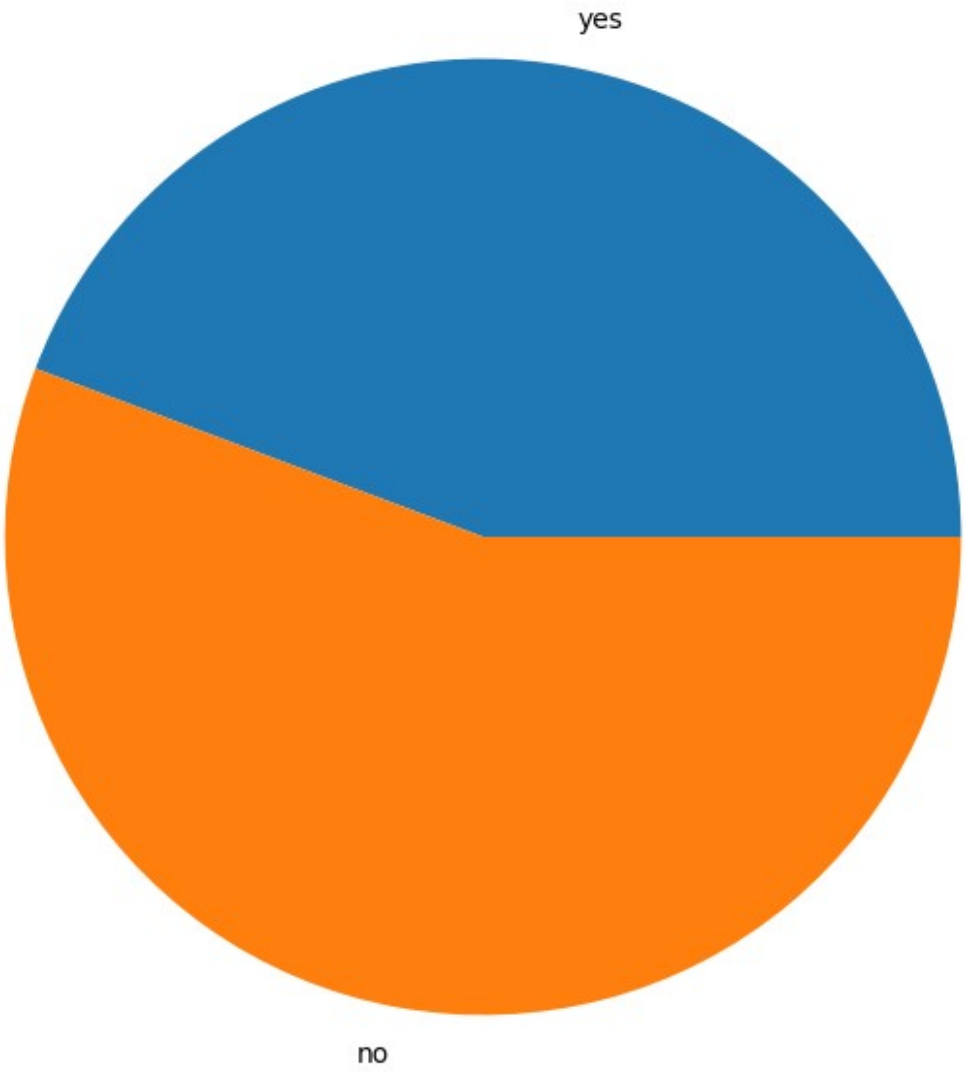


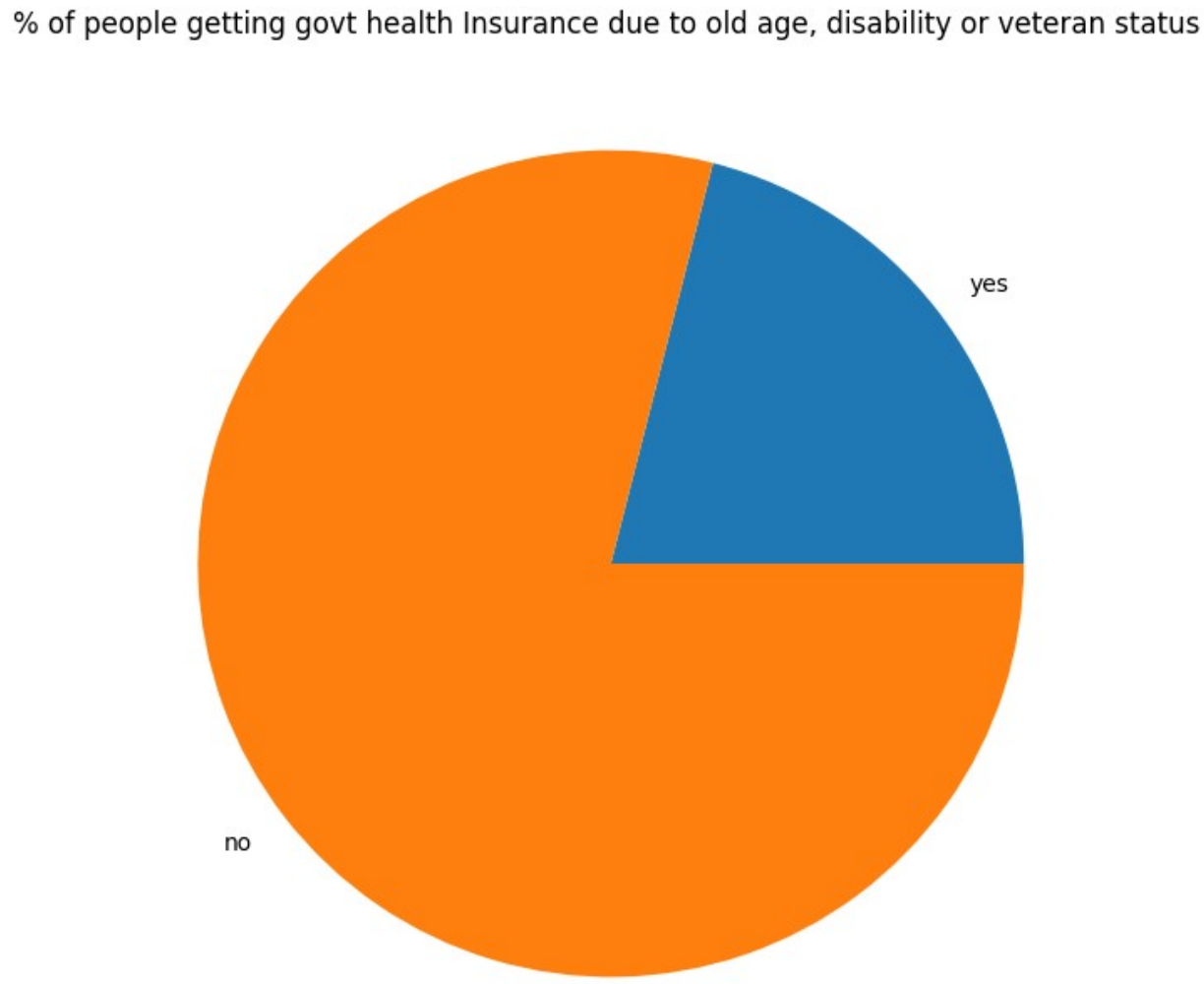
10. Visualize the percentage of people getting govt health Insurance due to low income, due to old age and also the percentage of people having private health insurance

```
label=['yes','no']
Y = df[df['freepoor']=='yes']
N = df[df['freepoor']=='no']
x = [Y.shape[0],N.shape[0]]
plt.figure(figsize=(8,8))
plt.pie(x,labels=label)
plt.title("% of people getting govt health Insurance due to low income
")
plt.show()
Y = df[df['private']=='yes']
N = df[df['private']=='no']
x = [Y.shape[0],N.shape[0]]
plt.figure(figsize=(8,8))
plt.pie(x,labels=label)
plt.title("% of people having private health Insurance ")
```

```
plt.show()
Y = df[df['freerepat']=='yes']
N = df[df['freerepat']=='no']
x = [Y.shape[0],N.shape[0]]
plt.figure(figsize=(8,8))
plt.pie(x,labels=label)
plt.title("% of people getting govt health Insurance due to old age,
disability or veteran status ")
plt.show()
```

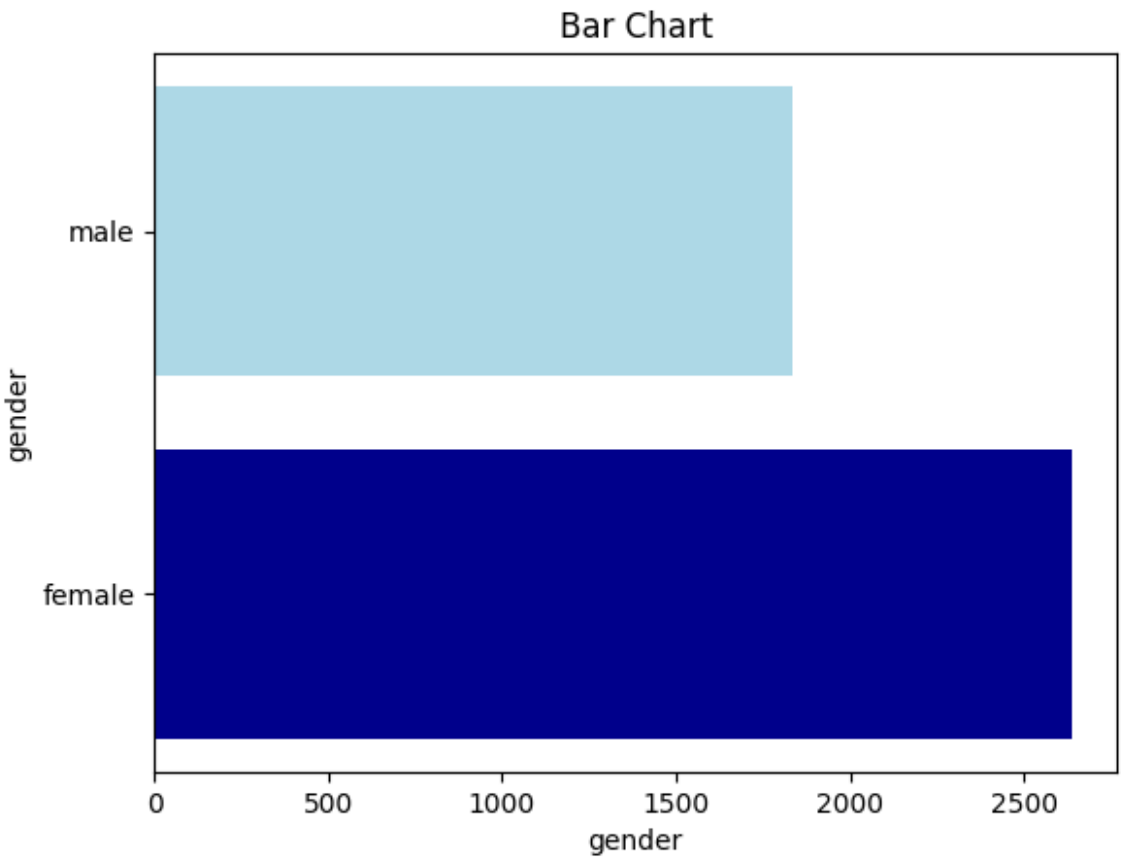



% of people having private health Insurance
yes
no



11. Plot a horizontal bar chart to analyze the reduced days of activity due to illness based on Gender

```
db= df.groupby('gender')['reduced'].sum().to_frame().reset_index()
plt.barh(db['gender'],db['reduced'],color = ['darkblue','lightblue'])
plt.title('Bar Chart')
plt.xlabel('gender')
plt.ylabel('gender')
plt.show()
```


Bar Chart
male
female
gender
0
500
1000
1500
2000
2500
gender