In [1]:

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

1.Load the data set and display first 15 rows

In [15]:

```python
df=pd.read_csv("DoctorVisits.csv")
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

In [3]:

```python
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 number of people based on their count of illeness

In [5]:

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

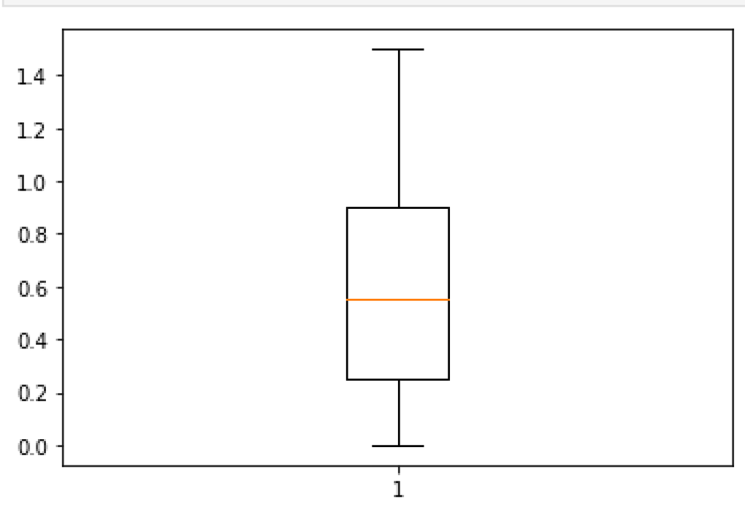
Out[5]:

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

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

In [6]:

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



5.Find out the number of days of reduced activity of male and female separatly due to illeness

In [7]:

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

Out[7]:

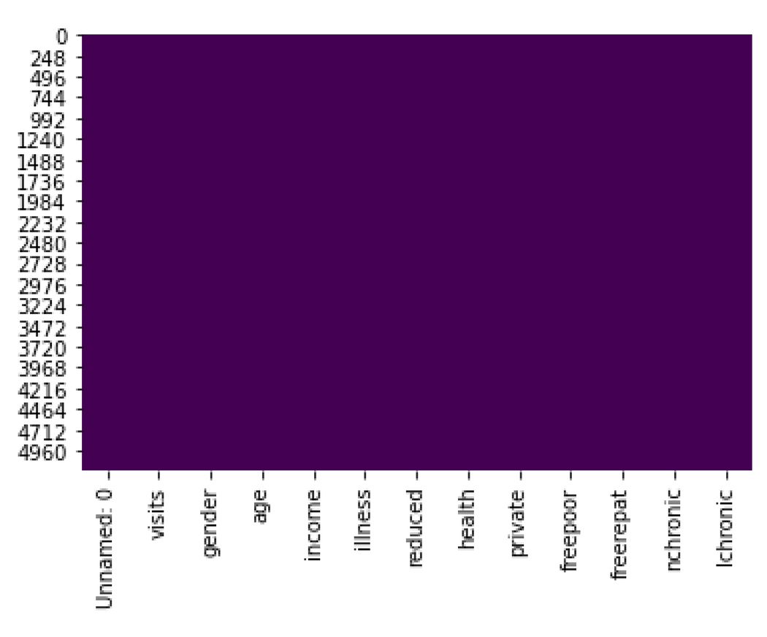
gender	reduced	Unnamed: 0	visits	age	income	illness	health
female	0	2524.038512	0.229322	0.465755	0.482735	1.462144	1.115098
	1	1985.768421	0.400000	0.325684	0.542105	2.242105	1.610526
	2	1622.618182	0.672727	0.391455	0.560182	2.236364	1.781818
	3	997.311111	1.333333	0.403111	0.516000	2.733333	1.733333
	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 any missing values in the dataset based on a heatmap

In [9]:

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

Out[9]: <AxesSubplot:>

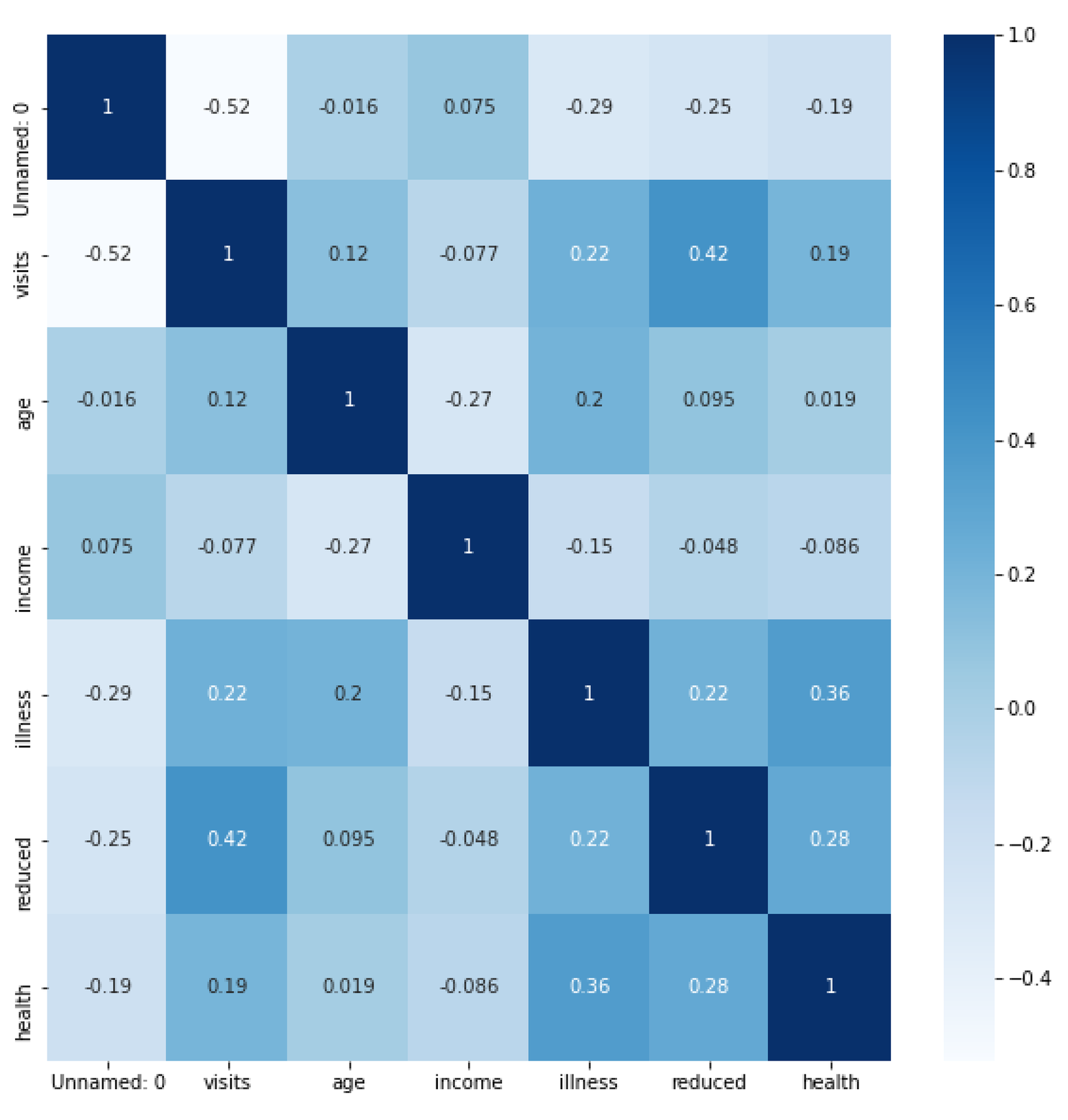


7.Find out the correlation between variables in the given dataset correlation between different variables

In [10]:

```python
plt.figure(figsize=(10,10))
sns.heatmap(df.corr(),cbar=True,annot=True,cmap='Blues')
```

Out[10]: <AxesSubplot:>

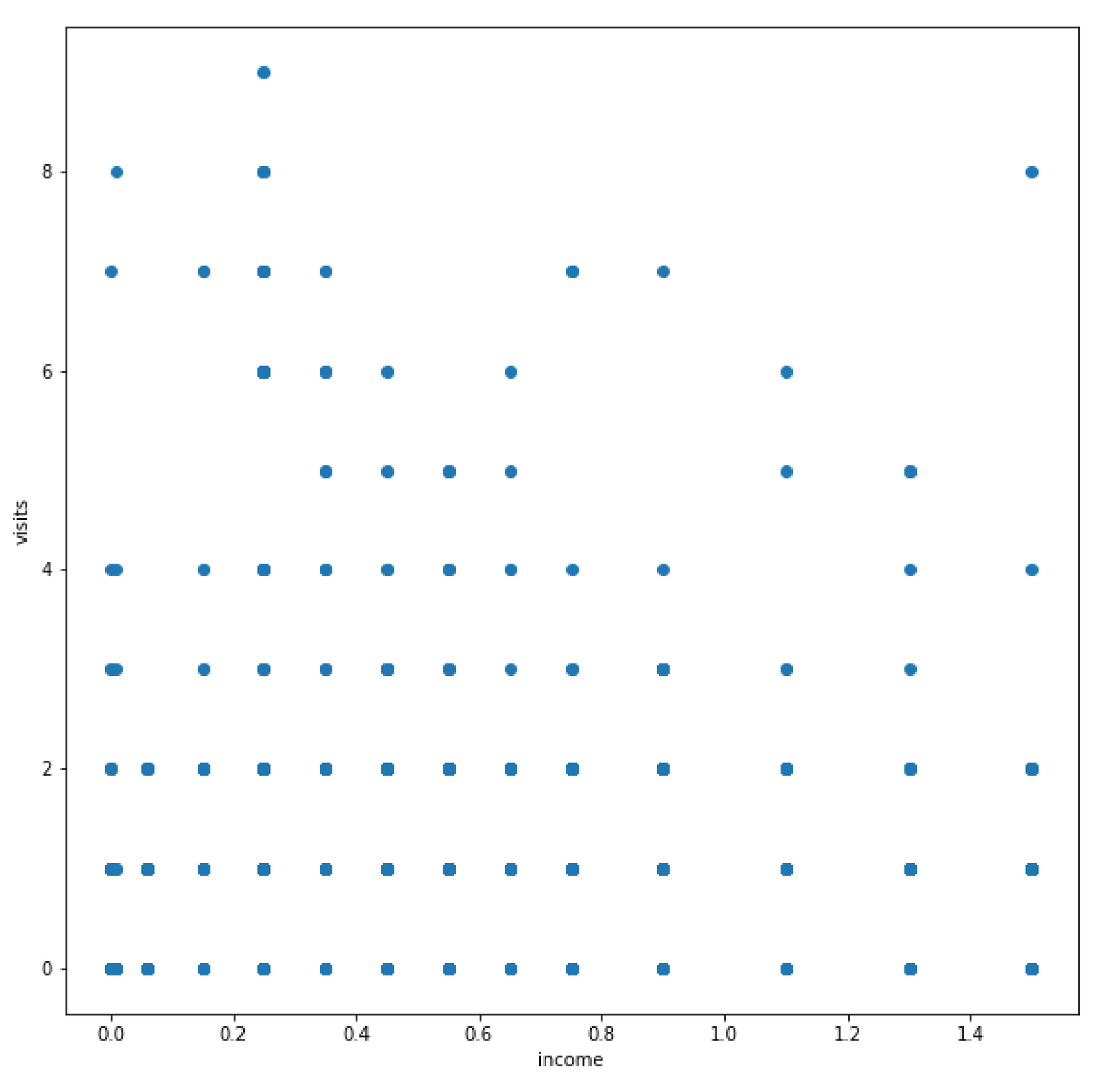


8.analyse how the income of a patient affects the number of visits to the hospital

In [11]:

```python
plt.figure(figsize=(10,10))
plt.scatter(x='income',y='visits',data=df)
plt.xlabel('income')
plt.ylabel('visits')
```

Out[11]: Text(0, 0.5, 'visits')

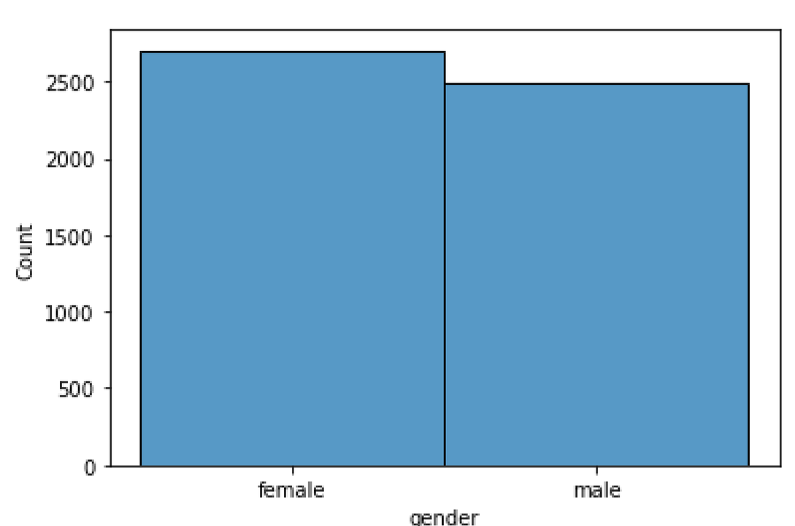


9.Count and visualize the number of males and females affected by illeness

In [12]:

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

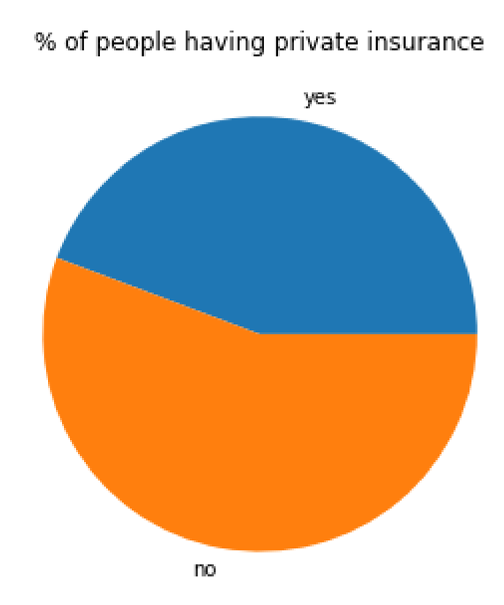
Out[12]: <AxesSubplot:xlabel='gender', ylabel='Count'>

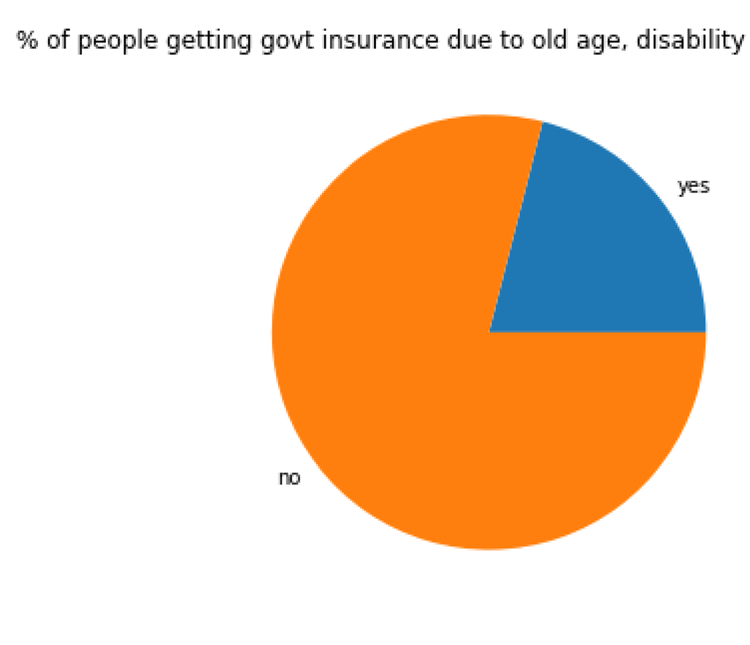


10. Visualize the percentage of people getting government health insurance due to low income,due to old age and also the percentage of people having private health insurance

In [13]:

```python
# % of people getting govt insurance due to low income
label=['yes','no']
Y=df[df['freepoor']=='yes']
N=df[df['freepoor']=='no']
x=[Y.shape[0],N.shape[0]]
plt.figure(figsize=(5,5))
plt.pie(x,labels=label)
plt.title("% of people getting govt insurance due to low income")
plt.show()
# % of people having private insurance
Y=df[df['private']=='yes']
N=df[df['private']=='no']
x=[Y.shape[0],N.shape[0]]
plt.figure(figsize=(5,5))
plt.pie(x,labels=label)
plt.title("% of people having private insurance")
plt.show()
# % of people getting govt insurance due to old age, disability or veteran status
Y=df[df['freerepat']=='yes']
N=df[df['freerepat']=='no']
x=[Y.shape[0],N.shape[0]]
plt.figure(figsize=(5,5))
plt.pie(x,labels=label)
plt.title("% of people getting govt insurance due to old age, disability or veteran status")
plt.show()
```

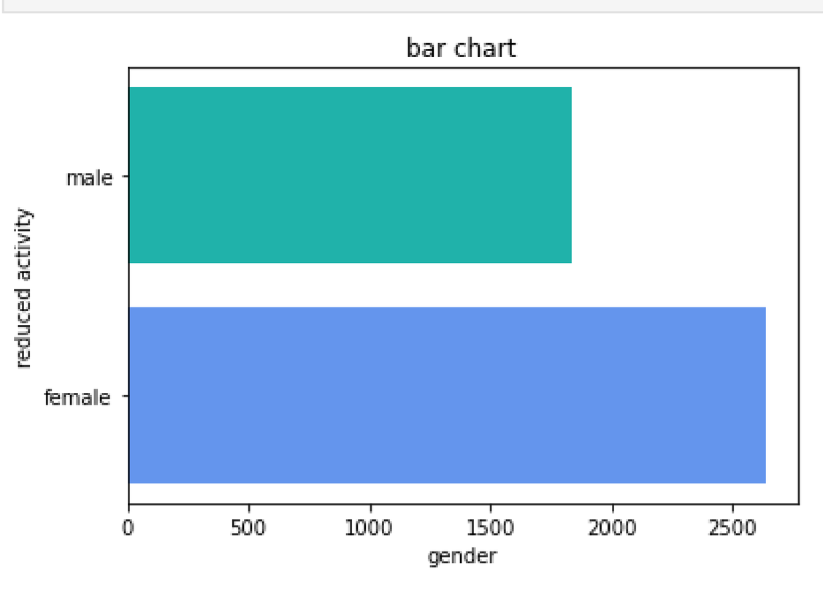




11.Plot a horizontal bar chart to analyze the reduced days of activity due to illeness based on gender

In [14]:

```python
db=df.groupby('gender')['reduced'].sum().to_frame().reset_index()
#creating the bar chart
plt.barh(db['gender'],db['reduced'],color=['cornflowerblue','lightseagreen'])
#adding the aesthetics
plt.title('bar chart')
plt.xlabel('gender')
plt.ylabel('reduced activity')
plt.show()
```



In [ ]: