In [3]:
```
import pandas as pd
import numpy as np
data=pd.read_csv("auto-mpg.csv")
data
```

Out[3]:

	mpg	cylinders	displacement	horsepower	weight	acceleration	model year	origin	car name
0	18.0	8	307.0	130	3504	12.0	70	1	chevrolet chevelle malibu
1	15.0	8	350.0	165	3693	11.5	70	1	buick skylark 320
2	18.0	8	318.0	150	3436	11.0	70	1	plymouth satellite
3	16.0	8	304.0	150	3433	12.0	70	1	amc rebel sst
4	17.0	8	302.0	140	3449	10.5	70	1	ford torino
...	...	...	...	...	...	...	...	...	...
393	27.0	4	140.0	86	2790	15.6	82	1	ford mustang gl
394	44.0	4	97.0	52	2130	24.6	82	2	vw pickup
395	32.0	4	135.0	84	2295	11.6	82	1	dodge rampage
396	28.0	4	120.0	79	2625	18.6	82	1	ford ranger
397	31.0	4	119.0	82	2720	19.4	82	1	chevy s-10

398 rows × 9 columns

In [4]:
```
data.head()
```

Out[4]:

	mpg	cylinders	displacement	horsepower	weight	acceleration	model year	origin	car name
0	18.0	8	307.0	130	3504	12.0	70	1	chevrolet chevelle malibu
1	15.0	8	350.0	165	3693	11.5	70	1	buick skylark 320
2	18.0	8	318.0	150	3436	11.0	70	1	plymouth satellite
3	16.0	8	304.0	150	3433	12.0	70	1	amc rebel sst
4	17.0	8	302.0	140	3449	10.5	70	1	ford torino

In [5]:
```
data.tail()
```

Out[5]:

	mpg	cylinders	displacement	horsepower	weight	acceleration	model year	origin	car name
393	27.0	4	140.0	86	2790	15.6	82	1	ford mustang gl
394	44.0	4	97.0	52	2130	24.6	82	2	vw pickup
395	32.0	4	135.0	84	2295	11.6	82	1	dodge rampage
396	28.0	4	120.0	79	2625	18.6	82	1	ford ranger
397	31.0	4	119.0	82	2720	19.4	82	1	chevy s-10

In [6]:
```
data.shape
```

Out[6]:
```
(398, 9)
```

In [7]:
```
data.describe()
```

Out[7]:

	mpg	cylinders	displacement	weight	acceleration	model year	origin
count	398.000000	398.000000	398.000000	398.000000	398.000000	398.000000	398.000000
mean	23.514573	5.454774	193.425879	2970.424623	15.568090	76.010050	1.572864
std	7.815984	1.701004	104.269838	846.841774	2.757689	3.697627	0.802055
min	9.000000	3.000000	68.000000	1613.000000	8.000000	70.000000	1.000000
25%	17.500000	4.000000	104.250000	2223.750000	13.825000	73.000000	1.000000
50%	23.000000	4.000000	148.500000	2803.500000	15.500000	76.000000	1.000000
75%	29.000000	8.000000	262.000000	3608.000000	17.175000	79.000000	2.000000
max	46.600000	8.000000	455.000000	5140.000000	24.800000	82.000000	3.000000

In [8]:
```
data.columns
```

Out[8]:
```
Index(['mpg', 'cylinders', 'displacement', 'horsepower', 'weight',
       'acceleration', 'model year', 'origin', 'car name'],
      dtype='object')
```

In [13]:
```
columns=data.select_dtypes(include='number')
columns
```

Out[13]:

	mpg	cylinders	displacement	weight	acceleration	model year	origin
0	18.0	8	307.0	3504	12.0	70	1
1	15.0	8	350.0	3693	11.5	70	1
2	18.0	8	318.0	3436	11.0	70	1
3	16.0	8	304.0	3433	12.0	70	1
4	17.0	8	302.0	3449	10.5	70	1
...	...	...	...	...	...	...	...
393	27.0	4	140.0	2790	15.6	82	1
394	44.0	4	97.0	2130	24.6	82	2
395	32.0	4	135.0	2295	11.6	82	1
396	28.0	4	120.0	2625	18.6	82	1
397	31.0	4	119.0	2720	19.4	82	1

398 rows × 7 columns

In [30]:
```
numeric=data.select_dtypes(include=[np.number])
```

In [31]:
```
data_mean=numeric.mean()
data_mean
```

Out[31]:
```
mpg              23.514573
cylinders         5.454774
displacement    193.425879
weight         2970.424623
acceleration     15.568090
model year       76.010050
origin            1.572864
dtype: float64
```

In [35]:
```
data_median=numeric.median()
data_median
```

Out[35]:
```
mpg              23.0
cylinders         4.0
displacement    148.5
weight         2803.5
acceleration     15.5
model year       76.0
origin            1.0
dtype: float64
```

In [36]:
```
data_mode=numeric.mode()
data_mode
```

Out[36]:

	mpg	cylinders	displacement	weight	acceleration	model year	origin
0	13.0	4.0	97.0	1985	14.5	73.0	1.0
1	NaN	NaN	NaN	2130	NaN	NaN	NaN

In [38]:
```
data_var=numeric.var()
data_var
```

Out[38]:
```
mpg              61.089611
cylinders         2.893415
displacement  10872.199152
weight        717140.990526
acceleration      7.604848
model year       13.672443
origin            0.643292
dtype: float64
```

In [37]:
```
data_std=numeric.std()
data_std
```

Out[37]:
```
mpg              7.815984
cylinders        1.701004
displacement   104.269838
weight         846.841774
acceleration     2.757689
model year       3.697627
origin           0.802055
dtype: float64
```

In [45]:
```
d=pd.DataFrame({'mean':data_mean,'median':data_median,'standarad deviation':da
d
```

Out[45]:

	mean	median	standarad deviation	Variance
mpg	23.514573	23.0	7.815984	61.089611
cylinders	5.454774	4.0	1.701004	2.893415
displacement	193.425879	148.5	104.269838	10872.199152
weight	2970.424623	2803.5	846.841774	717140.990526
acceleration	15.568090	15.5	2.757689	7.604848
model year	76.010050	76.0	3.697627	13.672443
origin	1.572864	1.0	0.802055	0.643292

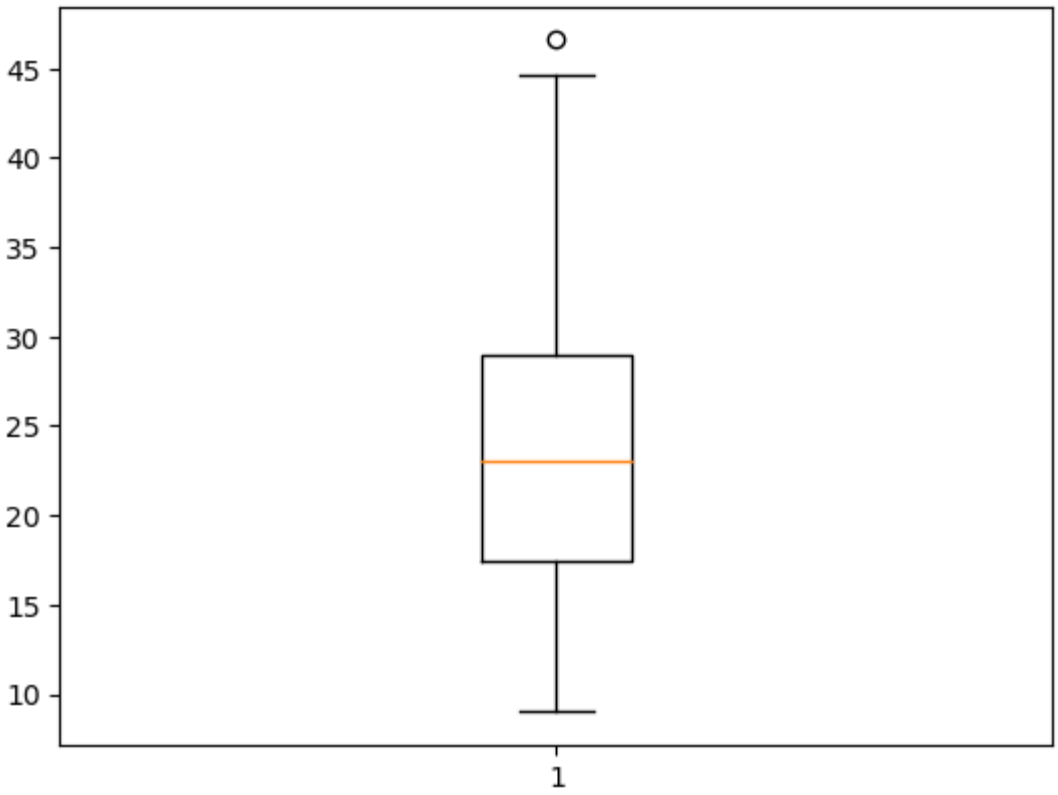
In [46]:
```
data_pos=pd.DataFrame(numeric.describe().loc[['min','25%','50%','75%','max']])
data_pos
```

Out[46]:

	mpg	cylinders	displacement	weight	acceleration	model year	origin
min	9.0	3.0	68.00	1613.00	8.000	70.0	1.0
25%	17.5	4.0	104.25	2223.75	13.825	73.0	1.0
50%	23.0	4.0	148.50	2803.50	15.500	76.0	1.0
75%	29.0	8.0	262.00	3608.00	17.175	79.0	2.0
max	46.6	8.0	455.00	5140.00	24.800	82.0	3.0

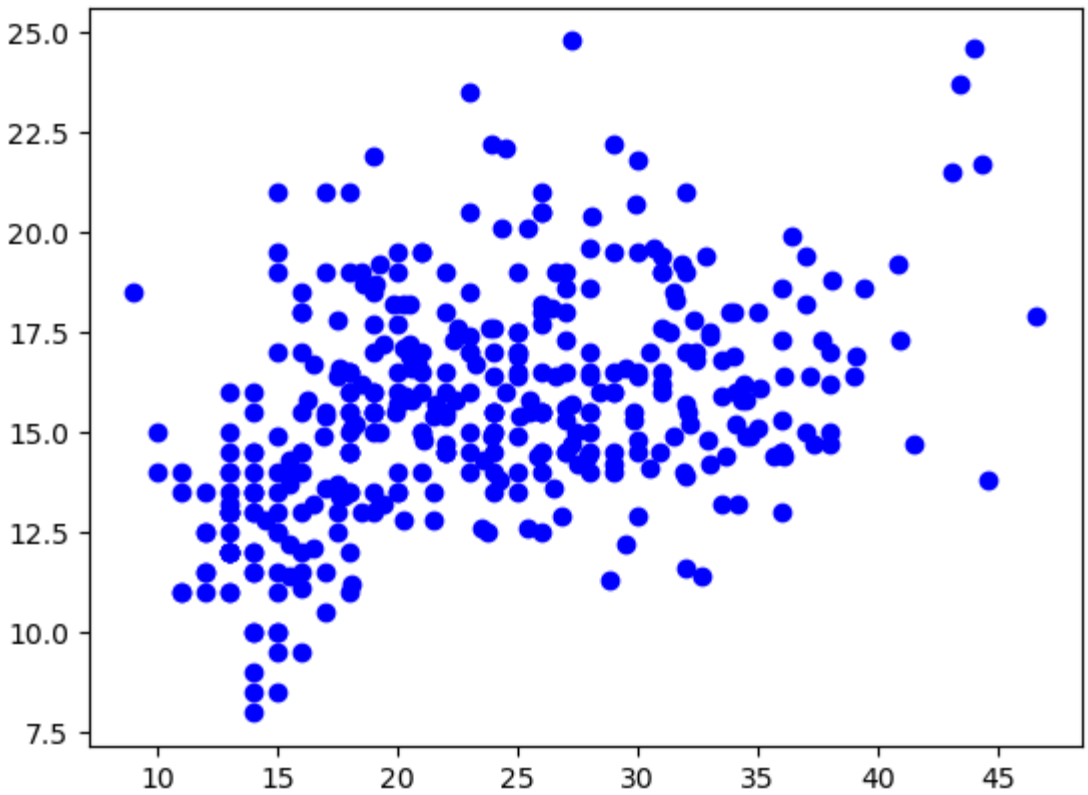
In [39]:
```
import matplotlib.pyplot as plt
plt.boxplot(data['mpg'])
```

Out[39]:
```
{'whiskers': [<matplotlib.lines.Line2D at 0x1bf5c59ed60>,
  <matplotlib.lines.Line2D at 0x1bf5c5ac070>],
 'caps': [<matplotlib.lines.Line2D at 0x1bf5c5ac340>,
  <matplotlib.lines.Line2D at 0x1bf5c5ac610>],
 'boxes': [<matplotlib.lines.Line2D at 0x1bf5c59ea60>],
 'medians': [<matplotlib.lines.Line2D at 0x1bf5c5ac8e0>],
 'fliers': [<matplotlib.lines.Line2D at 0x1bf5c5acbb0>],
 'means': []}
```



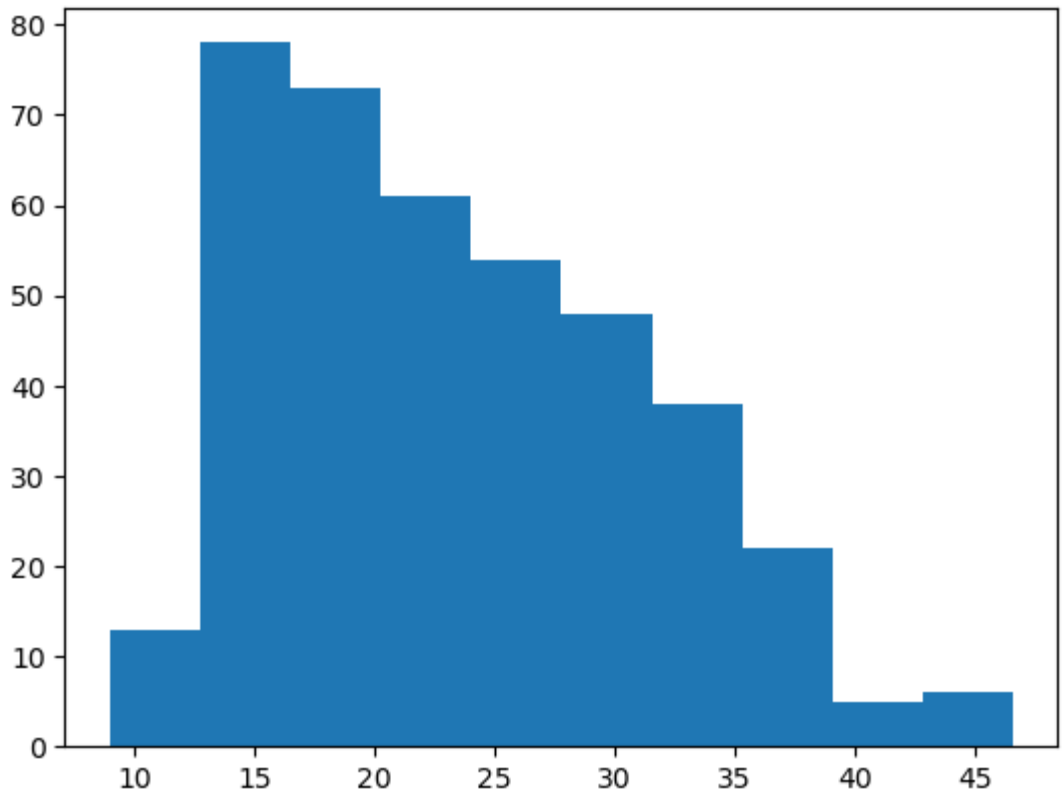
In [40]:
```
x=data['mpg']
y=data['acceleration']
plt.scatter(x,y,c="blue")
```

Out[40]:
```
<matplotlib.collections.PathCollection at 0x1bf5c610370>
```



In [44]:
```
plt.hist(x)
```

Out[44]:
```
(array([13., 78., 73., 61., 54., 48., 38., 22.,  5.,  6.]),
 array([ 9.  , 12.76, 16.52, 20.28, 24.04, 27.8 , 31.56, 35.32, 39.08,
        42.84, 46.6 ]),
 <BarContainer object of 10 artists>)
```



In [ ]: