A)Generate a random array of 50 integers and display them using a line chart, scatter plot. Apply appropriate color, labels and styling options.

In [62]:

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

In [63]:

```
#  Generate Random integers
data=np.random.randint(1,200,50)
data
```

Out[63]:

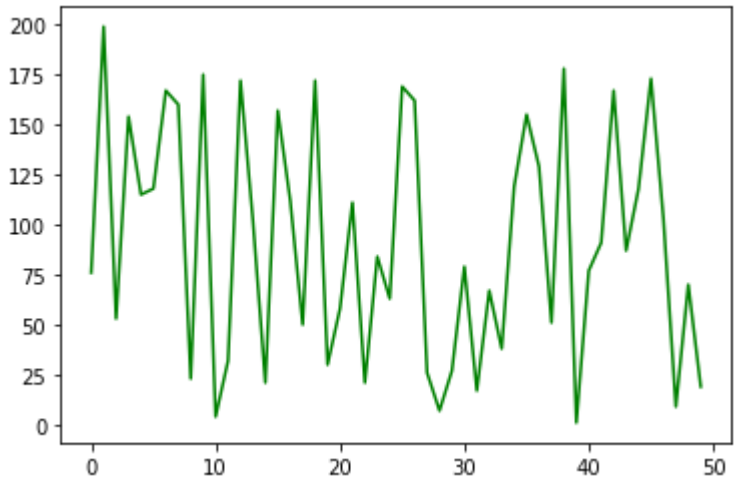
```
array([ 76, 199,  53, 154, 115, 118, 167, 160,  23, 175,   4,  32, 172,
       102,  21, 157, 112,  50, 172,  30,  58, 111,  21,  84,  63, 169,
       162,  26,   7,  27,  79,  17,  67,  38, 119, 155, 129,  51, 178,
         1,  77,  91, 167,  87, 118, 173, 103,   9,  70,  19])
```

In [64]:

```
plt.plot(data,c='green')
```

Out[64]:

```
[<matplotlib.lines.Line2D at 0xafdf632eb0>]
```

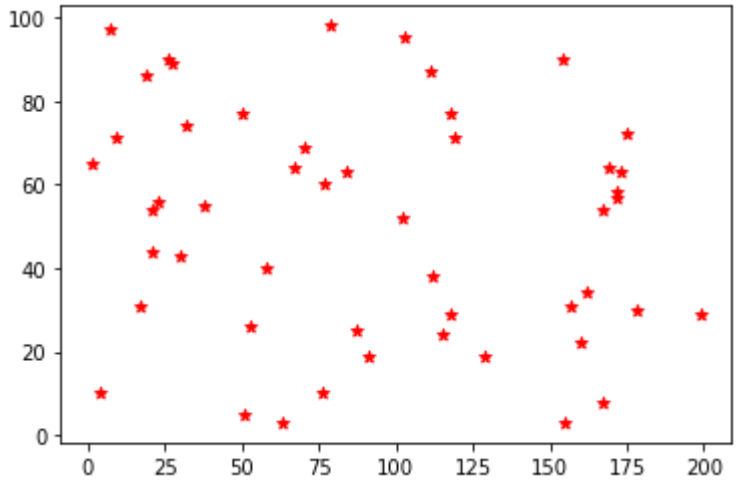


In [65]:

```
#scatter plot
x=data
y=np.random.randint(1,100,50)
plt.scatter(x,y,c='red',marker='*')
```

Out[65]:

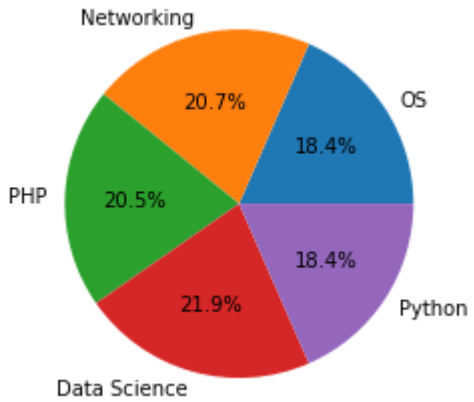
```
<matplotlib.collections.PathCollection at 0xafdf692730>
```



B) Create two lists, one representing subject names and the other representing marks obtained in those subjects. Display the data in a pie chart.

In [66]:

```
subject=['OS','Networking','PHP','Data Science','Python']
marks=[80,90,89,95,80]
plt.pie(marks,labels=subject,autopct='%1.1f%%')
plt.show()
```



C) Write a program in python to perform following task (Use winequality-red.csv) [5] Import Dataset and do the followings: 1) Describing the dataset 2) Shape of the dataset 3) Display first 3 rows from dataset

D) Add two outliers to the above data and display the box plot.

In [67]:

```
data
```

Out[67]:

```
array([ 76, 199,  53, 154, 115, 118, 167, 160,  23, 175,   4,  32, 172,
       102,  21, 157, 112,  50, 172,  30,  58, 111,  21,  84,  63, 169,
       162,  26,   7,  27,  79,  17,  67,  38, 119, 155, 129,  51, 178,
         1,  77,  91, 167,  87, 118, 173, 103,   9,  70,  19])
```

In [70]:

```
data=np.append(data,700)
data=np.append(data,900)
data
```

Out[70]:

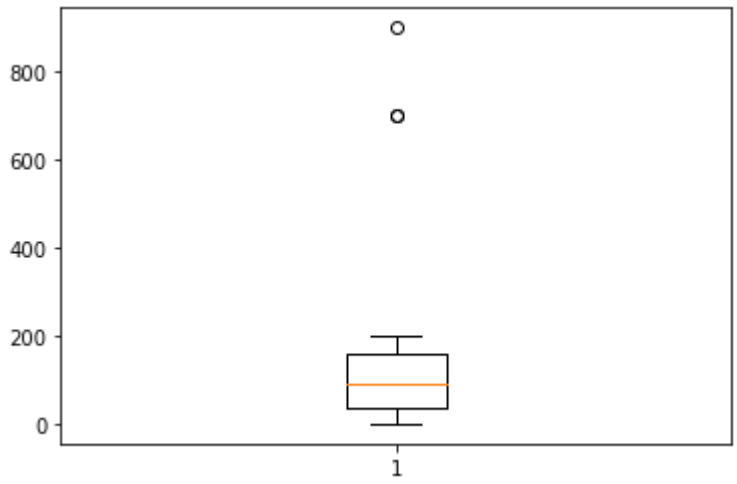
```
array([ 76, 199,  53, 154, 115, 118, 167, 160,  23, 175,   4,  32, 172,
       102,  21, 157, 112,  50, 172,  30,  58, 111,  21,  84,  63, 169,
       162,  26,   7,  27,  79,  17,  67,  38, 119, 155, 129,  51, 178,
         1,  77,  91, 167,  87, 118, 173, 103,   9,  70,  19, 700, 700,
       900])
```

In [71]:

```
plt.boxplot(data)
```

Out[71]:

```
{'whiskers': [<matplotlib.lines.Line2D at 0xafdf7a14c0>,
  <matplotlib.lines.Line2D at 0xafdf7a1820>],
 'caps': [<matplotlib.lines.Line2D at 0xafdf7a1b80>,
  <matplotlib.lines.Line2D at 0xafdf7a1ee0>],
 'boxes': [<matplotlib.lines.Line2D at 0xafdf7a1160>],
 'medians': [<matplotlib.lines.Line2D at 0xafdf7aa280>],
 'fliers': [<matplotlib.lines.Line2D at 0xafdf7aa580>],
 'means': []}
```



In [ ]: