Data Science:
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Data science is the process of derive the knowledge from the huge ammount of data through the organize,analyze and process the data.

Data Science is a Combination of Both Data Analysis and Data Reporting.

Data Analysis:
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Data Analysis means to analyze the data

we can analyze the data by using some data science techniques,that techniques are

1).Machine Learning
2).Deep Learning
3).NLP(Natural Language Processing)
4).Stastical analysis
5).sentimental analysis
6).Data mining
7).Image processing,
.....
.....,etc.,

python provides various libraries/packages to analyze the data or process the data,they are

1).Pandas
2).NumPy
3).SciPy

pandas:
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pandas is a standard and high-level data analysis/data processing package.

if we want to working with pandas first we need to install pandas library.

pip install pandas

pandas provides two data structure to perform data manipulations,they are

1).Series

2).DataFrame

Series:
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Series is a one-dimensional array with homogenious/hetrogenious data.

DataFrame:
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DataFrame is a Two-Dimensional Array with homogenious and hetrogenious data.

In DataFrame Rows are homogenious/hetrogenious but columns must be homogenious.

ex1: wap to get the pandas version
---
```
import pandas
print(pandas.__version__)
```

output:
-------
```
1.3.5
```

ex2:
---
```
import pandas
print(pandas.__version__)
print(pandas.__path__)
print(pandas.__name__)
print(pandas.__doc__)
```

ex3:
---
```
import pandas as pd
x=pd.Series([3,2,7,9])
print(x)
print(type(x))
print('*'*20)
print(x[0]) #indexing
print('*'*20)
print(x[:2]) #slicing
print('*'*20)
#print(x[-1])
#print(dir(x))
```

output:
-------
```
0    3
1    2
2    7
3    9
dtype: int64
<class 'pandas.core.series.Series'>
********************
3
********************
0    3
1    2
dtype: int64
********************
```

ex4:
---
```
import pandas as pd
x=pd.Series([3,2.3,7,9])
print(x)
print(type(x))
```

output:
------
```
0    3.0
1    2.3
2    7.0
3    9.0
dtype: float64
<class 'pandas.core.series.Series'>
```

ex5:
----
```
import pandas as pd
x=pd.Series([3,2.3,7+3j,9])
print(x)
print(type(x))
```

output:
-------
```
0    3.0+0.0j
1    2.3+0.0j
2    7.0+3.0j
3    9.0+0.0j
dtype: complex128
<class 'pandas.core.series.Series'>
```

ex6:
---
```
import pandas as pd
x=pd.Series()
print(x)
print(type(x))
```

output:
-----
```
Series([], dtype: float64)
<class 'pandas.core.series.Series'>
```

ex7:
----
```
import pandas as pd
x=pd.Series([3,2.3,7+3j,9,"siva"])
print(x)
```

```
print(type(x))

output:
------
0         3
1       2.3
2    (7+3j)
3         9
4      siva
dtype: object
<class 'pandas.core.series.Series'>

ex8:
----
import pandas as pd
x=pd.Series([3,2.3,7+3j,9,"siva",(5,6),[5,2],True])
print(x)
print(type(x))

output:
------
0         3
1       2.3
2    (7+3j)
3         9
4      siva
5    (5, 6)
6    [5, 2]
7      True
dtype: object
<class 'pandas.core.series.Series'>

note:
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in latest version's of Pandas Library,the Series allows both homogenious and
Hetrogenious data.

ex9:
----
import pandas as pd
info=[3,2.3,7+3j,9,"siva",(5,6),[5,2]]
ind=['a','b','c','d','e','f','g']
x=pd.Series(data=info,index=ind)
print(x)
print(type(x))

output:
------
a         3
b       2.3
```

```
c    (7+3j)
d         9
e      siva
f    (5, 6)
g    [5, 2]
dtype: object
<class 'pandas.core.series.Series'>

ex10: create a series object by using dictionary
----
import pandas as pd
info={'a':1,'b':2,'c':3}
x=pd.Series(info)
print(x)
print(type(x))

output:
------
a    1
b    2
c    3
dtype: int64
<class 'pandas.core.series.Series'>

ex11:
----
import pandas as pd
info={'a':"siva",'b':3.2,'c':3,'d':[4,5],'e':4j}
x=pd.Series(info)
print(x)
print(type(x))

output:
------
a      siva
b       3.2
c         3
d    [4, 5]
e        4j
dtype: object
<class 'pandas.core.series.Series'>

ex12:
----
import pandas as pd
info={'a':"siva",'b':3.2,'c':3,'d':[4,5],'e':4j}
x=pd.Series(info)
print(x)
print(x.index)
print(x.values)
```

```
print(x.dtype)
print(x.shape)
print(x.size)
print(x.ndim)

output:
------
a      siva
b       3.2
c         3
d    [4, 5]
e        4j
dtype: object

Index(['a', 'b', 'c', 'd', 'e'], dtype='object')

['siva' 3.2 3 list([4, 5]) 4j]

object

(5,)

5

1

ex13: create a series object by using scalar(single value)
-----
import pandas as pd
x=pd.Series(4)
print(x)

output:
------
0    4
dtype: int64

ex14:
----
import pandas as pd
x=pd.Series(4,index=['a','b','c','d'])
print(x)

output:
------
a    4
b    4
c    4
d    4
dtype: int64
```

ex15:
---
```
import pandas as pd
x=[3,2,5,8,1,3,7]
y=pd.Series(x)
print(y)
print(y.sum())
print(y.min())
print(y.max())
print(y.mean())
print(y.median())
print(y.mode())
```

output:
---
```
0    3
1    2
2    5
3    8
4    1
5    3
6    7
dtype: int64
29
1
8
4.142857142857143
3.0
0    3
dtype: int64
```