if we want to display all the available builtin and user-defined module in the python installation location by using help()

```
help('modules')
```

if we want to display all the properties of any module by using dir()

```
import modulename
dir(modulename)
```

if we want to working with any module, first we need to import that module into our program/module.

working with 'builtins' module:

'builtins' is a one builtin module in python.

if we want to display all the properties of 'builtins' module by using dir()

```
import builtins
dir(builtins)
```

if we want to use the builtins module properties directly without importing builtins module into our program/module.

ex:

```
x=[6,3,8,2]
print(x)
print(id(x))
print(type(x))
print(len(x))
print(sum(x))
print(min(x))
print(max(x))
print(sorted(x))
print(list(reversed(x)))
y=10
print(bin(y))
print(oct(y))
print(hex(y))
print(abs(5))
print(pow(2,3))
print(ord('a'))
print(chr(65))
```

output:

```
[6, 3, 8, 2]
1577181468608
```

```
<class 'list'>
4
19
2
8
[2, 3, 6, 8]
[2, 8, 3, 6]
0b1010
0o12
0xa
5
8
97
A
```

note:
-----
except builtins module we can access the properties from any another module compulssory we need to import that module.

working with 'math' module

'math' module is a one builtin module in python

if we want to display all the properties of 'math' module by using following command,

```
import math
dir(math)
```

ex:

```
from math import *
print(pi)
print(sin(90))
print(cos(0))
print(tan(45))
print(floor(2.9))
print(ceil(2.1))
print(sqrt(36))
print(factorial(5))
print(gcd(6,12))
print(lcm(4,8))
print(perm(5,2))
print(comb(5,2))
print(prod([4,3,6]))
```

output:

```
3.141592653589793
```

```
0.8939966636005579
1.0
1.6197751905438615
2
3
6.0
120
6
8
20
10
72

working with 'string' module
----------------------------
        the 'string' module is a builtin module in python

        if we want to display all the properties of 'string' module by using dir()

        import string
        dir(string)

ex1:
---
import string
print(string.ascii_letters)

output:
--------
'abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ'

ex2:
---
import string
print(string.ascii_lowercase)

output:
------
'abcdefghijklmnopqrstuvwxyz'

ex3:
---
import string
print(string.ascii_uppercase)

output:
-------
'ABCDEFGHIJKLMNOPQRSTUVWXYZ'

ex4:
```

```
----
import string
print(string.digits)

output:
-------
'0123456789'

ex5:
----
import string
print(string.octdigits)

output:
-------
'01234567'

ex6:
----
import string
print(string.hexdigits)

output:
-------
'0123456789abcdefABCDEF'

ex7:
----
import string
string.printable

output:
-------
'0123456789abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ!"#$%&\'()*+,-./:;<=
>?@[\\]^_`{|}~ \t\n\r\x0b\x0c'

ex8:
----
import string
string.punctuation

output:
------
'!"#$%&\'()*+,-./:;<=>?@[\\]^_`{|}~'

ex9:
----
import string
string.whitespace
```

output:

' \t\n\r\x0b\x0c'

ex10:

```
import string
string.capwords("hai rama 123krishna good evening")
'Hai Rama 123krishna Good Evening'

"hai rama 123krishna good evening".title()
'Hai Rama 123Krishna Good Evening'

"hai rama 123krishna good evening".capitalize()
'Hai rama 123krishna good evening'
```

working with 'random' module
----
the 'random' module is a builtin module in python

if we want to display 'random' module properties by using dir()

```
import random
dir(random)
```

ex1:

```
import random
print(random.random())
0.845958076747481

print(random.random())
0.5215255045058939

print(random.random())
0.9599724984293164

print(random.random())
0.3420919262771872
```

ex2:

```
import random
print(random.randint(1,5))
4
print(random.randint(1,5))
3
print(random.randint(1,5))
1
print(random.randint(1,5))
```

```
5
print(random.randint(1,5))
2

ex3:
----
import random
print(random.randrange(5))
0
print(random.randrange(5))
4
print(random.randrange(5))
3
print(random.randrange(5))
2
print(random.randrange(5))
1

ex4:
----
import random
print(random.randrange(1,5))
4
print(random.randrange(1,5))
2
print(random.randrange(1,5))
1
print(random.randrange(1,5))
3

ex5:
----
import random
print(random.randrange(1,10,2))
3
print(random.randrange(1,10,2))
7
print(random.randrange(1,10,2))
5
print(random.randrange(1,10,2))
1
print(random.randrange(1,10,2))
9

ex6:
----
import random
print(random.uniform(1,4))
3.7546943662514662
print(random.uniform(1,4))
```

```
3.8352041283752945
print(random.uniform(1,4))
2.8965277477213327
print(random.uniform(1,4))
3.785191600606101
print(random.uniform(1,4))
1.6383936936299688

ex7:
----
import random
x=[2,3.1,4j,False,"siva"]
print(random.choice(x))
False
print(random.choice(x))
2
print(random.choice(x))
3.1
print(random.choice(x))
siva
print(random.choice(x))
4j

ex8:
----
import random
x=[2,3.1,4j,False,"siva"]
print(random.choices(x))
['siva']
print(random.choices(x,k=2))
[4j, 4j]
print(random.choices(x,k=2))
[2, False]
print(random.choices(x,k=2))
[False, 'siva']
print(random.choices(x,k=3))
['siva', 3.1, 3.1]
print(random.choices(x,k=3))
[3.1, False, 4j]

ex9:
---
import random
x=[5,3,9,2,7,8,1]
random.shuffle(x)
print(x)
[1, 3, 9, 8, 7, 5, 2]

random.shuffle(x)
print(x)
```

```
[1, 2, 8, 5, 9, 7, 3]

random.shuffle(x)
print(x)
[8, 3, 1, 2, 5, 9, 7]

random.shuffle(x)
print(x)
[7, 9, 8, 2, 1, 5, 3]
```

ex10:
---
wap to generate specific no.of random digits like as a OTP's?

```
from random import randint
num=int(input("enter number of digits: "))
for i in range(num):
    print(randint(0,9),end="")
```

outputs:

```
enter number of digits: 5
14724

enter number of digits: 4
2365

enter number of digits: 6
661879
```

ex11:
----
wap to generate specific no.of random charecters like paswords?

```
from random import choice
from string import ascii_letters,digits
s=ascii_letters+'!@#$%^&*'+digits
num=int(input("enter number charecters: "))
for i in range(num):
    print(choice(s),end="")
```

(or)

```
from random import choices
from string import ascii_letters,digits
s=ascii_letters+'!@#$%^&*'+digits
num=int(input("enter number charecters: "))
print(''.join(choices(s,k=num)))
```

outputs:

```
--------
enter number charecters: 5
!VuY$

enter number charecters: 6
j$4kVI

enter number charecters: 4
NV4V
```

ex12:

---

wap to implement simple dice-game?

```
from random import randint
while True:
    roll_up=int(input("enter your choice: "))
    dice_face=randint(1,6)
    print("Dice Face Value is:",dice_face)
    if roll_up==dice_face:
        print("Congrates You are the winner")
    else:
        print("sorry,you are the looser")
    opt=input("do you want to continue this game: ")
    if opt in ['YES','Y','Yes','yes','y']:
        continue
    else:
        break
print("Thanks for Participating the Game")
```

output:

```
enter your choice: 5
Dice Face Value is: 2
sorry,you are the looser
do you want to continue this game: yes
enter your choice: 5
Dice Face Value is: 5
Congrates You are the winner
do you want to continue this game: yes
enter your choice: 3
Dice Face Value is: 6
sorry,you are the looser
do you want to continue this game: no
Thanks for Participating the Game
```