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

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

```
import time
dir(time)
```

ex1:

```
import time
print(time.ctime())
```

```
Sun Dec 12 14:29:47 2021
```

ex2:

```
import time
print(time.localtime())
```

```
time.struct_time(tm_year=2021, tm_mon=12, tm_mday=12, tm_hour=14, tm_min=30,
tm_sec=6, tm_wday=6, tm_yday=346, tm_isdst=0)
```

ex3:

```
import time
print(time.gmtime())
```

```
time.struct_time(tm_year=2021, tm_mon=12, tm_mday=12, tm_hour=9, tm_min=0,
tm_sec=20, tm_wday=6, tm_yday=346, tm_isdst=0)
```

ex4:

```
import time
print(time.asctime())
```

```
Sun Dec 12 14:30:53 2021
```

ex5:

```
import time
print(time.asctime(time.localtime()))
```

```
Sun Dec 12 14:31:04 2021
```

ex6:

```
import time
print(time.asctime(time.gmtime()))
```

Sun Dec 12 09:01:13 2021

ex7:

```
import time
for i in range(5):
    print("hai")
    time.sleep(3)
```

```
hai
hai
hai
hai
hai
```

ex8:

```
import time
print(time.tzname)
```

```
('India Standard Time', 'India Daylight Time')
```

ex9:

```
import time
stime=time.perf_counter()
print("welcome")
for i in range(5):
    print("hai")
    time.sleep(1)
for j in range(10):
    print("hello")
    time.sleep(1)
print("bye")
etime=time.perf_counter()
print("Elapsed Time %.2f'Seconds"%(etime-stime))
```

output:

```
welcome
hai
hai
hai
hai
hai
hello
hello
hello
```

```
hello
hello
hello
hello
hello
hello
hello
bye
Elapsed Time 15.42'Seconds

ex10:
-----
import time
print(time.strftime('%Y-%m-%d'))
2021-12-12
print(time.strftime('%Y-%m-%d %H:%M:%S',time.localtime()))
2021-12-12 14:40:54
print(time.strftime('%Y-%m-%d %H:%M:%S'))
2021-12-12 14:41:03
print(time.strftime('%Y-%m-%d %H:%M:%S',time.gmtime()))
2021-12-12 09:11:13
print(time.strftime('%a %Y-%b-%d %I:%M:%S %p'))
Sun 2021-Dec-12 02:41:48 PM
print(time.strftime('%a %Y-%b-%d %I:%M:%S %p',time.gmtime()))
Sun 2021-Dec-12 09:12:07 AM
print(time.strftime('%A %y-%B-%d %I:%M:%S %p'))
Sunday 21-December-12 02:42:24 PM

ex11:
----
import time
print(time.strptime('1991-01-14','%Y-%m-%d'))
time.struct_time(tm_year=1991, tm_mon=1, tm_mday=14, tm_hour=0, tm_min=0, tm_sec=0,
tm_wday=0, tm_yday=14, tm_isdst=-1)

print(time.strptime('1991-01-14 08:32:21','%Y-%m-%d %H:%M:%S'))
time.struct_time(tm_year=1991, tm_mon=1, tm_mday=14, tm_hour=8, tm_min=32,
tm_sec=21, tm_wday=0, tm_yday=14, tm_isdst=-1)

print(time.ctime())
'Sun Dec 12 14:46:45 2021'

print(time.strptime(time.ctime(),'%a %b %d %H:%M:%S %Y'))
time.struct_time(tm_year=2021, tm_mon=12, tm_mday=12, tm_hour=14, tm_min=47,
tm_sec=38, tm_wday=6, tm_yday=346, tm_isdst=-1)

working with 'datetime' module
------------------------------
        the datetime module is a builtin module in python.
```

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

```
        import datetime
        dir(datetime)
```

ex1:

```
import datetime
x=datetime.datetime(1991,1,14)

print(x)
datetime.datetime(1991, 1, 14, 0, 0)

print(type(x))
<class 'datetime.datetime'>
```

ex2:

```
import datetime
y=datetime.datetime.now()

print(y)
datetime.datetime(2021, 12, 12, 14, 52, 41, 10922)

print(type(y))
<class 'datetime.datetime'>

print(y.year)
2021

print(y.month)
12
print(y.day)
12

print(y.year)
2021

print(y.hour)
14

print(y.minute)
52

print(y.second)
41

print(y.microsecond)
10922
```

```
print(y.ctime())
Sun Dec 12 14:52:41 2021

print(y.min)
0001-01-01 00:00:00

print(y.max)
9999-12-31 23:59:59.999999

print(y.strftime('%Y-%m-%d %H:%M:%S'))
2021-12-12 14:52:41

ex3:
----
import datetime
z=datetime.date(1991,1,14)

print(z)
datetime.date(1991, 1, 14)

print(type(z))
<class 'datetime.date'>

ex4:
----
import datetime
a=datetime.date.today()

print(a)
2021-12-12

print(type(a))
<class 'datetime.date'>

print(a.year)
2021

print(a.month)
12

print(a.day)
12

print(a.ctime())
Sun Dec 12 00:00:00 2021

print(a.min)
0001-01-01

print(a.max)
```

```
9999-12-31

print(a.strftime('%Y-%m-%d'))
2021-12-12

ex5:
----
import datetime
b=datetime.time()

print(b)
datetime.time(0, 0)

print(type(b))
<class 'datetime.time'>

ex6:
----
import datetime
c=datetime.time(14,23,21,6754)

print(c)
14:23:21.006754

print(type(c))
<class 'datetime.time'>

print(c.hour)
14

print(c.minute)
23

print(c.second)
21

print(c.microsecond)
6754

print(c.strftime('%H:%M:%S'))
14:23:21

ex7:
----
import datetime
x=datetime.datetime.now()

print(x)
2021-12-12 15:03:00.236871
```

```
print(x-datetime.timedelta(days=1))
2021-12-11 15:03:00.236871

print(x+datetime.timedelta(days=1))
2021-12-13 15:03:00.236871

print(x-datetime.timedelta(seconds=1))
2021-12-12 15:02:59.236871

print(x+datetime.timedelta(seconds=1))
2021-12-12 15:03:01.236871

print(x-datetime.timedelta(hours=1))
2021-12-12 14:03:00.236871

print(x+datetime.timedelta(hours=1))
2021-12-12 16:03:00.236871

ex8:
---
wap to calcaulate age of the given birth-year?

from datetime import date
byear=int(input("enter birth year: "))
cyear=date.today().year
print("Hey,you are %d'years old"%(cyear-byear))

output:
------
enter birth year: 1991
Hey,you are 30'years old

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

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

        import calendar
        dir(calendar)

ex1:
----
wap to print particular year of calendar?

from calendar import calendar
year=int(input("enter which year calendar you want to print? "))
print(calendar(year))
```

(or)

```
from calendar import calendar
year=int(input("enter which year calendar you want to print? "))
print(calendar(year,m=2)) # m means no.of months in a row
```

(or)

```
from calendar import prcal
year=int(input("enter which year calendar you want to print? "))
prcal(year,m=2) # m means no.of months in a row
```

output:

```
------
enter which year calendar you want to print? 2021
                      2021

      January                   February
Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su
              1  2  3       1  2  3  4  5  6  7
 4  5  6  7  8  9 10       8  9 10 11 12 13 14
11 12 13 14 15 16 17      15 16 17 18 19 20 21
18 19 20 21 22 23 24      22 23 24 25 26 27 28
25 26 27 28 29 30 31

       March                     April
Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su
 1  2  3  4  5  6  7                1  2  3  4
 8  9 10 11 12 13 14       5  6  7  8  9 10 11
15 16 17 18 19 20 21      12 13 14 15 16 17 18
22 23 24 25 26 27 28      19 20 21 22 23 24 25
29 30 31                  26 27 28 29 30

        May                       June
Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su
                1  2          1  2  3  4  5  6
 3  4  5  6  7  8  9       7  8  9 10 11 12 13
10 11 12 13 14 15 16      14 15 16 17 18 19 20
17 18 19 20 21 22 23      21 22 23 24 25 26 27
24 25 26 27 28 29 30      28 29 30
31

        July                      August
Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su
          1  2  3  4                         1
 5  6  7  8  9 10 11       2  3  4  5  6  7  8
12 13 14 15 16 17 18       9 10 11 12 13 14 15
19 20 21 22 23 24 25      16 17 18 19 20 21 22
26 27 28 29 30 31         23 24 25 26 27 28 29
                          30 31
```

```
     September                 October
Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su
       1  2  3  4  5                  1  2  3
 6  7  8  9 10 11 12       4  5  6  7  8  9 10
13 14 15 16 17 18 19      11 12 13 14 15 16 17
20 21 22 23 24 25 26      18 19 20 21 22 23 24
27 28 29 30               25 26 27 28 29 30 31

      November                  December
Mo Tu We Th Fr Sa Su      Mo Tu We Th Fr Sa Su
 1  2  3  4  5  6  7             1  2  3  4  5
 8  9 10 11 12 13 14       6  7  8  9 10 11 12
15 16 17 18 19 20 21      13 14 15 16 17 18 19
22 23 24 25 26 27 28      20 21 22 23 24 25 26
29 30                     27 28 29 30 31
```

ex2:
---
wap to print which month calendar from the given year?

```
from calendar import month
year=int(input("enter which year calendar you want to print? "))
mon_num=int(input("enter which month calendar you want to print? "))
print(month(year,mon_num))

        (or)
from calendar import prmonth
year=int(input("enter which year calendar you want to print? "))
mon_num=int(input("enter which month calendar you want to print? "))
prmonth(year,mon_num)
```

output:

```
enter which year calendar you want to print? 1991
enter which month calendar you want to print? 1

    January 1991
Mo Tu We Th Fr Sa Su
    1  2  3  4  5  6
 7  8  9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30 31
```

ex3:
---
wap to check wheather given year is LeapYear or not?

```
from calendar import isleap
year=int(input("enter your year: "))
if isleap(year):
    print("Given year is LeapYear")
else:
    print("Given year is not a LeapYear")

outputs:
-------
enter your year: 1991
Given year is not a LeapYear

enter your year: 1992
Given year is LeapYear

enter your year: 2020
Given year is LeapYear

enter your year: 2021
Given year is not a LeapYear

ex4:
----
wap to print the leap years between given range of years?

from calendar import isleap
syear=int(input("enter your starting year: "))
eyear=int(input("enter your ending year: "))
for year in range(syear,eyear+1):
    if isleap(year):
        print(year)

output:
-------
enter your starting year: 1991
enter your ending year: 2021
1992
1996
2000
2004
2008
2012
2016
2020

ex5:
---
wap to print the no.of leapdays between the given range of years?

from calendar import leapdays
```

```
syear=int(input("enter your starting year: "))
eyear=int(input("enter your ending year: "))
print("the no_of leap days between %d and %d are:%d'days"
      %(syear,eyear,leapdays(syear,eyear+1)))

output:
------
enter your starting year: 1991
enter your ending year: 2021
the no_of leap days between 1991 and 2021 are:8'days

ex6:
----
wap to print the previous month and next month of the given month?

from calendar import _prevmonth,_nextmonth
year=int(input("enter your year: "))
mon_num=int(input("enter month_num: "))
print("Previous Month:",_prevmonth(year,mon_num))
print("Next Month:",_nextmonth(year,mon_num))

output:
------
enter your year: 1991
enter month_num: 12
Previous Month: (1991, 11)
Next Month: (1992, 1)

ex7:
---
from calendar import TextCalendar,SUNDAY,month
year=int(input("enter your year: "))
mon_num=int(input("enter month_num: "))
print(month(year,mon_num))
print('*'*20)
c=TextCalendar(SUNDAY)
print(c.formatmonth(year,mon_num))

output:
-------
enter your year: 2021
enter month_num: 12
   December 2021
Mo Tu We Th Fr Sa Su
       1  2  3  4  5
 6  7  8  9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30 31
```

```
********************
   December 2021
Su Mo Tu We Th Fr Sa
          1  2  3  4
 5  6  7  8  9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30 31

ex8:
----
from calendar import HTMLCalendar,month
year=int(input("enter your year: "))
mon_num=int(input("enter month_num: "))
print(month(year,mon_num))
print('*'*20)
c=HTMLCalendar()
print(c.formatmonth(year,mon_num))

output:
------
enter your year: 2021
enter month_num: 12
   December 2021
Mo Tu We Th Fr Sa Su
       1  2  3  4  5
 6  7  8  9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30 31

********************
<table border="0" cellpadding="0" cellspacing="0" class="month">
<tr><th colspan="7" class="month">December 2021</th></tr>
<tr><th class="mon">Mon</th><th class="tue">Tue</th><th class="wed">Wed</th><th
class="thu">Thu</th><th class="fri">Fri</th><th class="sat">Sat</th><th
class="sun">Sun</th></tr>
<tr><td class="noday"> </td><td class="noday"> </td><td
class="wed">1</td><td class="thu">2</td><td class="fri">3</td><td
class="sat">4</td><td class="sun">5</td></tr>
<tr><td class="mon">6</td><td class="tue">7</td><td class="wed">8</td><td
class="thu">9</td><td class="fri">10</td><td class="sat">11</td><td
class="sun">12</td></tr>
<tr><td class="mon">13</td><td class="tue">14</td><td class="wed">15</td><td
class="thu">16</td><td class="fri">17</td><td class="sat">18</td><td
class="sun">19</td></tr>
<tr><td class="mon">20</td><td class="tue">21</td><td class="wed">22</td><td
class="thu">23</td><td class="fri">24</td><td class="sat">25</td><td
class="sun">26</td></tr>
<tr><td class="mon">27</td><td class="tue">28</td><td class="wed">29</td><td
```

class="thu">30</td><td class="fri">31</td><td class="noday"> </td><td
class="noday"> </td></tr>
</table>