Python - Date & Time

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introduction

- It is very important to work with date and time in python.
- Python has several modules to work with date and time.

```
import datetime
#Get Current Date and Time
CurrentDateTime = datetime.datetime.now()
print(CurrentDateTime) #output 2015-12-19 09:26:03.478039
#Get Current Date
CurrentDate= datetime.date.today()
print(CurrentDate) #output 2015-12-19
#let us get today year, month, day from date object
print("Current year: ", CurrentDate.year)
print("Current month: ", CurrentDate.month)
print("Current day: ", CurrentDate.day)
```

- Now let us see some important classes

Commonly used classes in datetime module are:

1. date Class
2. time Class
3. datetime Class
4. timedelta Class

datetime.date Class

- Datetime.date class is used to store specific date as date.
- This class has constructor in which we use to giveyear, month & date as argument(input).
- Let us see example

```
import datetime
birth_date = datetime.date(1998,8,28)
print(birth_date)
```

OR

```
from datetime import date
birth_date = date(1998,8,28)
print(birth_date)
```

What is timestamp

- Timestamp is unique number that shows gap between epoch and current date and time in terms seconds.
- The Unix epoch is 00:00:00 UTC on 1 January 1970
- This is large unique number which keep increasing as the current date and time progress.

How to get current time stamp

```
from datetime import datetime
ts = datetime.now().timestamp()
print("timestamp:-", ts) #float
print("timestamp:-", int(ts)) #int
```

How to Get date from a timestamp?

```
from datetime import date
ts = date.fromtimestamp(1326244364)
print("Date =", ts)

Output Date = 2012-01-11
```

How to create time object from given hour, minute, second

```
#Print hour, minute, second and microsecond
from datetime import time
anytime = time(11, 34, 56) #construct time object using time class
print("hour =", anytime.hour)
print("minute =", anytime.minute)
print("second =", anytime.second)
print("microsecond =", anytime.microsecond)
```

how to create datetime object that has both date and time

```
from datetime import datetime
#For only date use
datetime(year, month, day)
a = datetime(2018, 11, 28)
print(a)
```

- # for both date and time use

```
datetime(year, month, day, hour, minute, second,
  microsecond)
b = datetime(2017, 11, 28, 23, 55, 59, 342380)
print(b)
print("year =", b.year)
print("month =", b.month)
print("hour =", b.hour)
print("minute =", b.minute)
print("timestamp =", b.timestamp())
```

how to find gap between two date?

- from datetime import datetime, date

```
#gap between date using date class
t1 = date(year = 2018, month = 7, day = 12)
t2 = date(year = 2017, month = 12, day = 23)
t3 = t1 - t2 #different is returned in days & hour minute and
   second


print("t3 =", t3)
#gap between date using datetime class
t4 = datetime(year = 2018, month = 7, day = 12, hour = 7, minute
   = 9, second = 33)
t5 = datetime(year = 2019, month = 6, day = 10, hour = 5, minute
   = 55, second = 13)
t6 = t4 - t5 #different is returned in days & hour minute and
   second
print("t6 =", t6)
print("total seconds =", abs(t6.total_seconds())) #different in
   second
```

how to convert one format date into another format?

- we can do this task using built strftime() and strptime() methods.
- The strftime() method is defined under classes date, datetime and time.
- This method is basically used to convert Date from one format into another format
- It can not convert String into date. For this purpose we must use strptime function.

```
from datetime import datetime
# current date and time
now = datetime.now()
print(now) #now has datetime in Y%M%d H%M%S

t = now.strftime("%H:%M:%S")
print("time:", t)

s1 = now.strftime("%m/%d/%Y, %H:%M:%S") # mm/dd/YY H:M:S format
print("s1:", s1)

s2 = now.strftime("%d/%m/%Y, %H:%M:%S") # dd/mm/YY H:M:S format
print("s2:", s2)
```

Flags we can use in strftime and strptime methods

1. %m: Month as a zero-padded decimal number (01, 02, ..., 12).
2. %B: Full month name (e.g., January).
3. %b: Abbreviated month name (e.g., Jan).
4. %d: Day of the month as a zero-padded decimal number (01, 02, ..., 31).
5. %A: Full weekday name (e.g., Monday).
6. %a: Abbreviated weekday name (e.g., Mon).
7. %H: Hour (00, 01, ..., 23).
8. %I: Hour (01, 02, ..., 12).
9. %p: AM or PM.
10. %M: Minute as a zero-padded decimal number (00, 01, ..., 59).
11. %S: Second as a zero-padded decimal number (00, 01, ..., 59).

Strptime() function

- This function is used to check date given as string and convert it into datetime object if date given as 1st input is as per format given as 2nd input.
- This is required to store user given as datetime object so that we can do other date time related functions on it like display date in various format, add days into date, compare date etc

```
birth_date = input("give your birthdate in dd-mm-yyyy format")
print(birth_date)

   us_format_date = datetime.strptime(birth_date,'%d-%m-%Y')
print(us_format_date.strftime('%A %m-%d-%Y')
```