

# Working with Dates and Times in Python: Takeaways

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## Syntax

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### IMPORTING MODULES AND DEFINITIONS

- Importing a whole module:

```
import csv
csv.reader()
```

- Importing a whole module with an alias:

```
import csv as c
c.reader()
```

- Importing a single definition:

```
from csv import reader
reader()
```

- Importing multiple definitions:

```
from csv import reader, writer
reader()
writer()
```

- Importing all definitions:

```
from csv import *
```

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### WORKING WITH THE `DATETIME` MODULE

- All examples below presume the following import code:

```
import datetime as dt
```

- Creating `datetime.datetime` string given a month, year, and day:

```
eg_1 = dt.datetime(1985, 3, 13)
```

- Creating a `datetime.datetime` object from a string:

```
eg_2 = dt.datetime.strptime("24/12/1984", "%d/%m/%Y")
```

- Converting a `datetime.datetime` object to a string:

```
dt_object = dt.datetime(1984, 12, 24)
dt_string = dt_object.strftime("%d/%m/%Y")
```

- Instantiating a `datetime.time` object:

```
eg_3 = datetime.time(hour=0, minute=0, second=0, microsecond=0)
```

- Retrieving a part of a date stored in the `datetime.datetime` object:

```
eg_1.day
```

- Creating a date from a `datetime.datetime` object:

```
d2_dt = dt.datetime(1946, 9, 10)
d2 = d2_dt.date()
```

- Creating a `datetime.date` object from a string:

```
d3_str = "17 February 1963"
d3_dt = dt.datetime.strptime(d3_str, "%d %B %Y")
d3 = d3_dt.date()
```

- Instantiating a `datetime.timedelta` object:

```
eg_4 = dt.timedelta(weeks=3)
```

- Adding a time period to a `datetime.datetime` object:

```
d1 = dt.date(1963, 2, 26)
d1_plus_1wk = d1 + dt.timedelta(weeks=1)
```

- Convert integers to objects based on their epoch time value:

```
datetime.datetime.fromtimestamp(345521)
```

## Concepts

- The `datetime` module contains five classes:
  - `datetime.datetime` — For working with date and time data
  - `datetime.date` — For working with date data only
  - `datetime.time` — For working with time data only
  - `datetime.timedelta` — For representing time periods
  - `datetime.timezone` — For representing a specific time zone

- Time objects behave similarly to datetime objects for the following reasons:
  - They have attributes like `time.hour` and `time.second` that you can use to access individual time components.
  - They have a `time.strftime()` method, which you can use to create a formatted string representation of the object.
- The timedelta type represents a period of time, e.g. 30 minutes or two days.
- Epoch time represents time as an integer, counting the number of seconds since midnight on January 1, 1970. Epoch time is the default on the majority of the world's servers, which makes it an important time format to know and understand.
- Common format codes when working with `datetime.datetime.strptime` :

Strftime Code	Meaning	Examples
<code>%d</code>	Day of the month as a zero-padded number <sup>1</sup>	<code>04</code>
<code>%A</code>	Day of the week as a word <sup>2</sup>	<code>Monday</code>
<code>%m</code>	Month as a zero-padded number <sup>1</sup>	<code>09</code>
<code>%Y</code>	Year as a four-digit number	<code>1901</code>
<code>%y</code>	Year as a two-digit number with zero-padding <sup>1, 3</sup>	<code>01</code> (2001) <code>88</code> (1988)
<code>%B</code>	Month as a word <sup>2</sup>	<code>September</code>
<code>%H</code>	Hour in 24 hour time as zero-padded number <sup>1</sup>	<code>05</code> (5am) <code>15</code> (3pm)
<code>%p</code>	AM or PM <sup>2</sup>	<code>AM</code>
<code>%I</code>	Hour in 12 hour time as zero-padded number <sup>1</sup>	<code>05</code> (5am, or 5pm if AM/PM indicates otherwise)
<code>%M</code>	Minute as a zero-padded number <sup>1</sup>	<code>07</code>

1. The `strptime` parser will parse non-zero padded numbers without raising an error.

2. Date parts containing words will be interpreted using the locale settings on your computer, so `strptime` won't be able to parse 'febrero' (february in Spanish) if your locale is set to an english language locale.

3. Year values from 00-68 will be interpreted as 2000-2068, with values 70-99 interpreted as 1970-1999.

- Operations between timedelta, datetime, date, and time objects:

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Operation:		Explanation	Resultant Type
Epoch Time:			
<b>Epoch Time</b>	<b>Date/Time in UTC</b>		
<code>datetime - datetime</code>	Calculate the time between two specific dates/times	Notes	timedelta
<code>0</code>	Midnight, January 1, 1970		
<code>datetime - timedelta</code>	Subtract a time period from a date or time.		datetime
<code>1</code>	One second after midnight, January 1, 1970	Add a time period to a date or time.	datetime
<code>timedelta + 60</code>	One minute after midnight, January 1, 1970	Add two periods of time together	timedelta
<code>3600</code>	One hour after January 1, 1970	Calculate the difference between two time periods.	timedelta
<code>86400</code>	Midnight, January 2, 1970	Divide a time period by a number.	timedelta
<code>timedelta * integer</code>	Multiply a time period by a number.		timedelta

## Resources

- [Python Documentation – Datetime module](#)
- [Python Documentation: Strftime/Strptime Codes](#)
- [strftime.org](#)
- [Wikipedia – Epoch time](#)



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