# Working with Dates and Times in Python: Takeaways



## Syntax

### 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 *
```

## 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)
```

## Concepts

- The datetime module contains the following classes:
  - `datetime.datetime` — For working with date and time data
  - `datetime.time` — For working with time data only
  - `datetime.timedelta` — For representing time periods
- 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.
- Common format codes when working with `datetime.datetime.strptime`:

| Strftime Code | Meaning | Examples |
|---|---|---|
| `%d` | Day of the month as a zero-padded number[1] | `04` |
| `%A` | Day of the week as a word[2] | `Monday` |
| `%m` | Month as a zero-padded number[1] | `09` |
| `%Y` | Year as a four-digit number | `1901` |
| `%y` | Year as a two-digit number with zero-padding[1, 3] | `01` (2001)<br>`88` (1988) |
| `%B` | Month as a word[2] | `September` |
| `%H` | Hour in 24 hour time as zero-padded number[1] | `05` (5 a.m.)<br>`17` (5 p.m.) |

| | | |
|---|---|---|
| | padded number[1] | `15` (3 p.m.) |
| `%p` | a.m. or p.m.[2] | `AM` |
| `%I` | Hour in 12 hour time as zero-padded number[1] | `05` (5 a.m., or 5 p.m. if `AM` / `PM` indicates otherwise) |
| `%M` | Minute as a zero-padded number[1] | `07` |

*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, and time objects (datetime can be substituted with time):

| **Operation** | **Explanation** | **Resultant Type** |
|---|---|---|
| `datetime - datetime` | Calculate the time between two specific dates/times | timedelta |
| `datetime - timedelta` | Subtract a time period from a date or time. | datetime |
| `datetime + timedelta` | Add a time period to a date or time. | datetime |
| `timedelta + timedelta` | Add two periods of time together | timedelta |
| `timedelta - timedelta` | Calculate the difference between two time periods. | timedelta |

## Resources

- Python Documentation – Datetime module
- Python Documentation: Strftime/Strptime Codes
- strftime.org