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Agenda

- Software packages and libraries
- Pip
- Recap of the previous lessons

What are software packages?

A software package is simply a **piece of code** that **someone else wrote** and that you can **use** in your project.

You've already used software packages (also called libraries) before, `datetime` and `random` :

```
import random
from datetime import datetime

random_num = random.randint(1, 50)
print(random_num)

time_now = datetime.now()
print(time_now)
```

These two are among the standard Python packages that come together with the Python installation. You could say these are **official** Python software packages.

"Unofficial" software packages

A Python package can be created by anyone (even you). If you wrote a piece of code that you think might be beneficial also to some other programmers, you can make it available to anyone.

Of course, your package will (very likely) **not** become a part of the standard Python library, like `datetime` and `random` .

But you can still make it available to everyone through a tool called **pip.**

Pip

Pip is a package management system used to install and manage software packages written in Python.

Anyone can upload a Python package to pip or download a package from it. Let's try it out!

Installing a Python library

First make sure you're using a virtual environment. You can open the Terminal in PyCharm and if the first line starts with parenthesis `(`, then you have the virtual environment turned on.

Next create a file called `requirements.txt` in your project. Add the following line in it:

```
prettytable
```

And lastly run a command in the Terminal to install the packages listed in `requirements.txt`:

```
pip install -r requirements.txt
```

If you managed to successfully install the Python package, you can start using it. Create a new Python file and add the following code into it:

```
from prettytable import PrettyTable

table = PrettyTable(["animal", "ferocity"])

table.add_row(["wolverine", 100])
table.add_row(["grizzly", 87])
table.add_row(["cat", -1])
table.add_row(["dolphin", 63])

print(table)
```

Run the file... You should see a nice table in your Terminal now. Congrats!

> ***Careful:*** *Yes, pip is very useful, because you can use a piece of code (package) already developed by some other programmer, so you don't have to reinvent a wheel. But on the other hand, a dishonest developer can put malicious code inside a package they created.*
>
> *You can avoid this by only using popular/trusted pip packages, which are regularly examined by many people. Or to manually inspect every pip package you use yourself.*

Recap and Q&A

- A Q&A session on this and the previous Python lessons.
- Students can work on exercises and homework they haven't finished yet.

Bonus

- Python exceptions and try/except statement (https://realpython.com/python-exceptions/)

- Dead Simple Python: Virtual Environments and pip (https://dev.to/codemouse92/dead-simple-python-virtual-environments-and-pip-5b56)
- Python decorators (https://sumit-ghosh.com/articles/demystifying-decorators-python/)
- Passing by reference vs. Passing by value in Python (https://storage.googleapis.com/smartninja/passing-by-reference-in-python-1548347175.pdf)