

Confirmation of qualifications



Prove that you are ready for a
brainstorm!

Demonstrate your knowledge of the
standard Python library.



Confirmation of
qualifications



What is the Python standard library?

What does it include?



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All the features of the Python language are described in a large set of Python files: the Python standard library.

We are already familiar with the built-in capabilities of the library, as well as some modules.

Built-in capabilities
(executed immediately)

The random module
(working with random numbers)

The time module
(getting and calculating time)

The turtle module
(graphic primitives)

The os module
(interaction with a PC system)

...



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Which capabilities of the `random` module do you know?



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The **random module** contains tools for generating random values.

Useful functions:

<i>Function</i>	<i>Purpose</i>
<code>randint(a, b)</code>	To generate a random integer greater than or equal to a and less than or equal to b
<code>random()</code>	To generate a random decimal from 0 (inclusive) to 1 (not inclusive)

Example:

```
from random import randint
lottery_num = randint(1000, 9999)
print(lottery_num)
```



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How do we connect a module to a program?



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Connecting and using the module

Step 1

```
import random
```

Step 2

```
number = random.randint(0, 9)
```

Step 1

```
from random import randint
```

Step 2

```
number = randint(0, 9)
```

Step 1

```
from random import *
```

Step 2

```
number = randint(0, 9)
```

Connecting the whole module. When using a command, we need to specify which module it is from.

Connecting one function from the module. When we call a function, we only specify its name.

Connecting all the functions of the module. When we call a function, we only specify its name.



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Which capabilities of the **time** module do you know?



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The **time module** contains tools for working with time-related quantities.

Useful functions:

<i>Function</i>	<i>Purpose</i>
time()	Returns the number of seconds since the beginning of the epoch <i>(for UNIX systems, this is January 1, 1970)</i>
sleep(seconds)	Suspend the program for a number of seconds
round(number, digits)	Round the number to some number of digits after the decimal point <i>Basic function (not from time)</i>

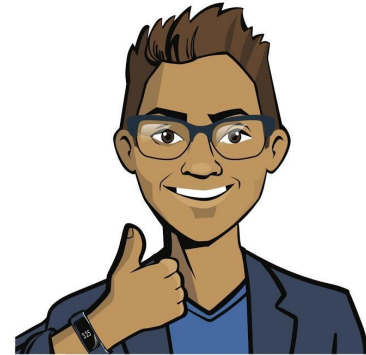


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Qualifications confirmed!

Great, you are ready to brainstorm and complete your work task!

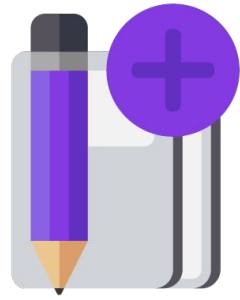


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Brainstorm:

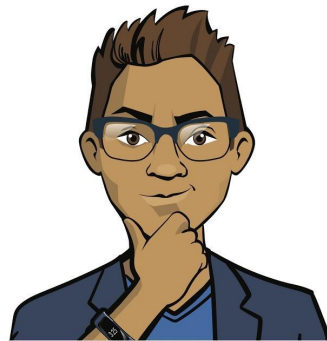
Creating modules



Creating modules

Developers will often put code blocks in separate modules.

This not only makes the project structure more convenient but also makes it possible to use your own work in other projects.



Brain
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Module use examples

A few examples of modules used by other developers.

Willie has developed an accounting system for a confectionery plant.

*Then, the system was packaged in the **factory module**.*



Willie used that module while working on his next order from a producer of carbonated soft drinks.



Brain
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Module use examples

A few examples of modules used by other developers.

Willie has developed an accounting system for a confectionery plant.

*Then, the system was packaged in the **factory module**.*



Willie used that module while working on his next order from a producer of carbonated soft drinks.

Susan has developed a set of mechanics for the “Big Guns” online game.

*The mechanics were packaged in the **shooter module**.*



John, Susan’s teammate, used the module involved in the development of another shooter RPG.



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Creating modules

To create your own module:

- ❑ Save a file with the required code in another project.
- ❑ Connect this file to the desired program as a module.



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- ❑ Connect this file to the desired program as a module.

Database file (module)

```
def get_data():
```

Function body

```
def searching(data):
```

Function body

```
def print_results(res):
```

Function body

Main file or task tab

```
import database
```

```
current = database.get_data()
```

```
res = database.searching(current)
```

```
database.print_results(res)
```



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Developer recommendations

Remember that the code should be easily readable!

- ❑ When using your own module, connect it via `import <module name>` to see the location of the functions called.
- ❑ If you do not want to provide the module name each time you call its function, use explanatory comments.



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Developer recommendations

Remember that the code should be easily readable!

- ❑ When using your own module, connect it via `import <module name>` to see the location of the functions called.
- ❑ If you do not want to provide the module name each time you call its function, use explanatory comments.

```
import sport_rules  
sport_rules.print_football()
```



A person reading the code will immediately see that the function is located in another file.

```
from sport_rules import print_football  
print_football() #printing football rules
```



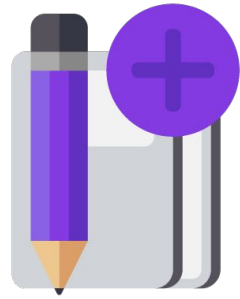
The comment refers to the module that contains the rules for various sports.



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Brainstorm:

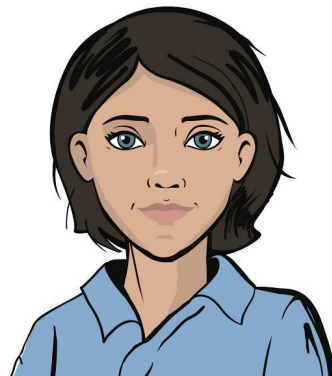
Work on
the project



Let's go back to the order

Today's key objective is to implement the “Answer-back program” project.

Previously, we decided to put the request processing functionality into a separate module.

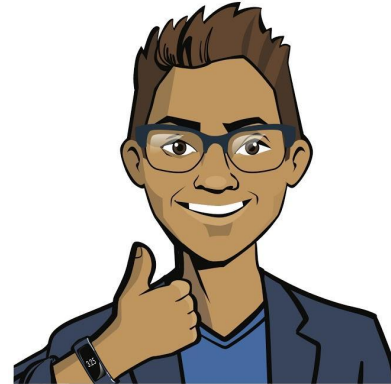


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Project planning

To simplify our work on the project and demonstrate its capabilities to the customer, we will reflect the functionality on a special diagram called a mind map.



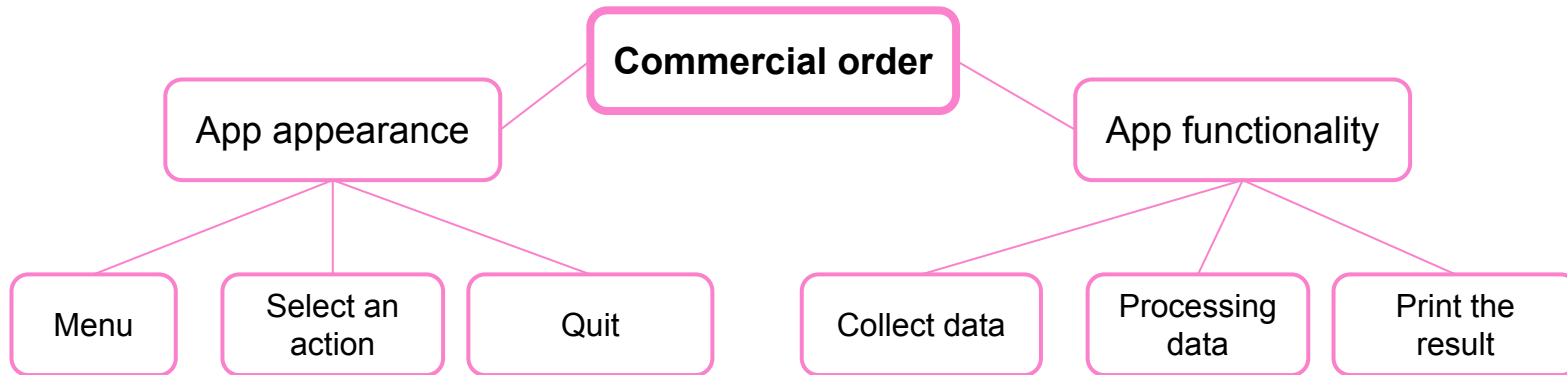
Brain
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Project planning

To simplify our work on the project and demonstrate its capabilities to the customer, we will reflect the functionality on a special diagram called a mind map.

A mind map is a tool used to visualize an idea, break it into pieces and plan the work.

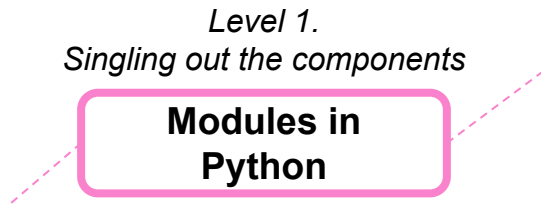


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Project planning

To compose a mind map, you need to single out a central idea and its parts. Then, single out the components of each part, etc.

Example: create a mind map for the “Modules” topic.

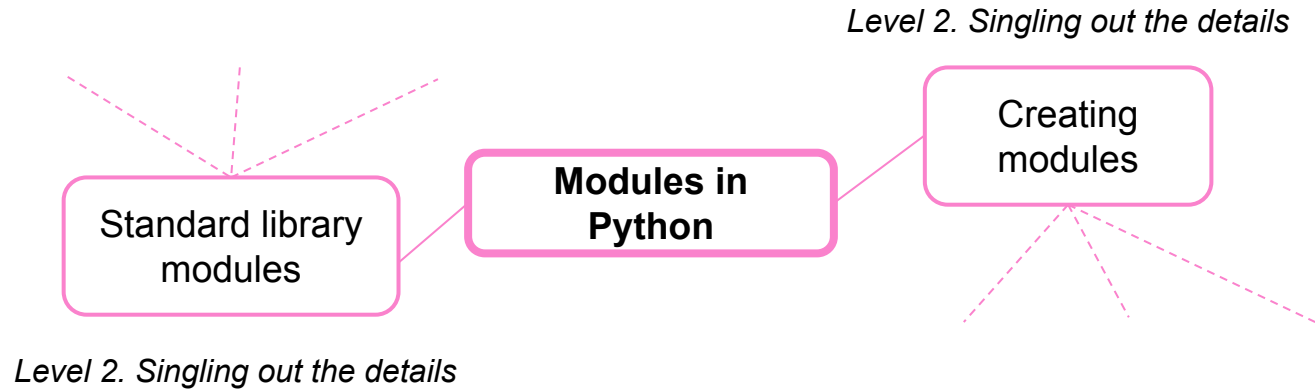


Brain
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Project planning

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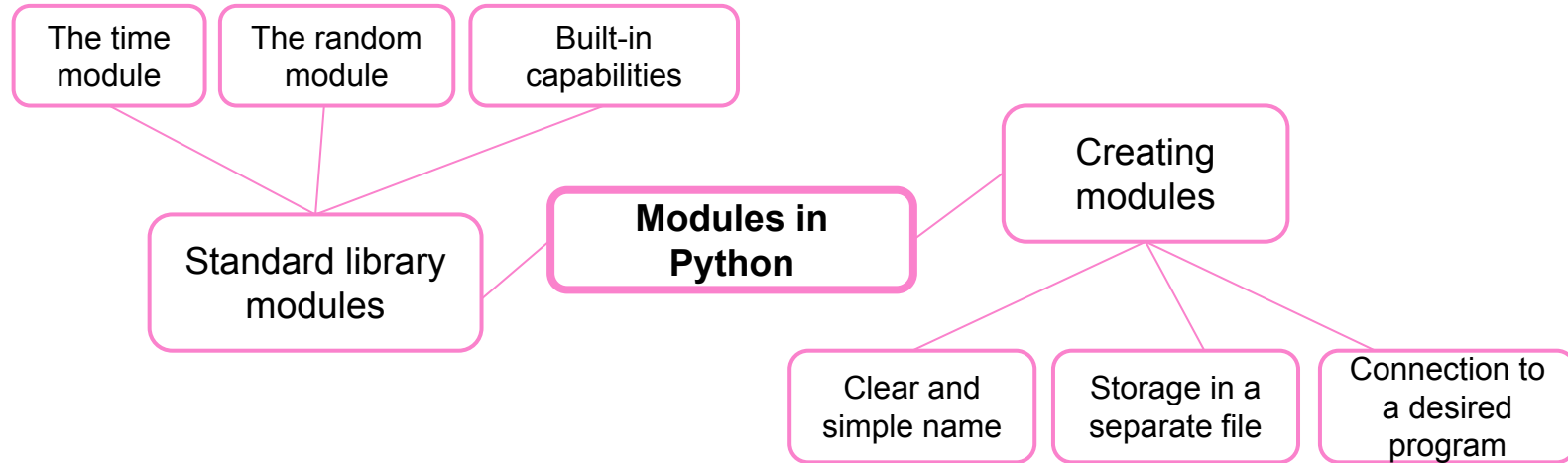


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Project planning

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Example: create a mind map for the “Modules” topic.



Which other components can we identify?



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Basic mind map of the “Answer-back program”

Let’s start forming a mind map for the “Answer-back program” project. You can complete it in a special tab on the platform.

**Customer request
response system**

A mind map is a creative diagram, so there is no single “correct” one!



**Brain
storm**

Basic mind map of the “Answer-back program”

Let's start forming a mind map for the “Answer-back program” project. You can complete it in a special tab on the platform.

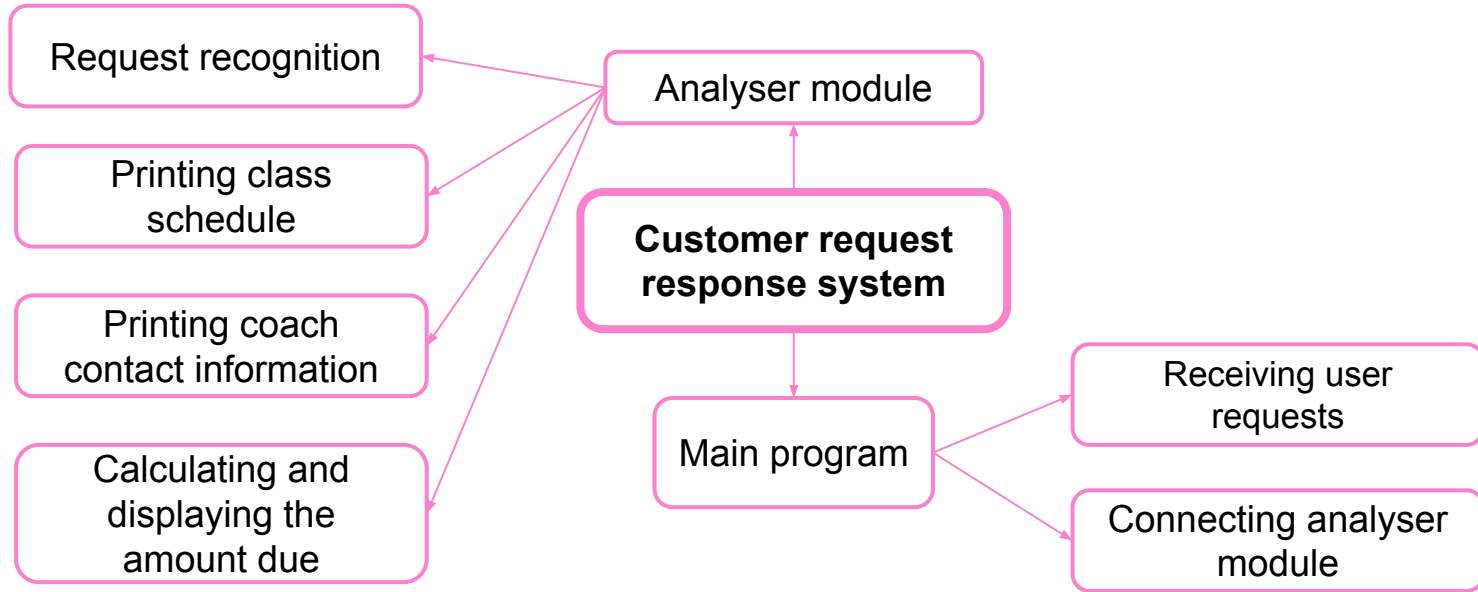


Diagram suggested by developer Cole



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Project exercise

The goal is to create an answer-back program that recognizes user requests.

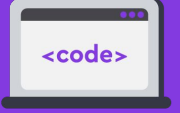
Example: “I do not remember the class schedule” —> Printing a schedule

Basic questions:

1. Class schedule.
2. Coach contact information.
3. Print the amount due for the classes.

Add two requests of your own to the answer-back program!

*It is convenient to put the functions handling user requests
into a separate module!*



Work on
the platform