

Explain: instance method, class method, static method in python.

Instance Methods

Defined with `def` inside a class.

Take `self` as the first argument, which represents the instance of the class.

Can access and modify the instance's data and methods.

Used to perform operations on specific instances of the class.

Example:

```
class Person:
```

```
    def __init__(self, name, age):
```

```
        self.name = name
```

```
        self.age = age
```

```
    def greet(self):
```

```
        print(f"Hello, my name is {self.name} and I am {self.age} years old.")
```

Class Methods

Defined with `@classmethod` decorator inside a class.

Take `cls` as the first argument, which represents the class itself.

Can access and modify class-level data and methods.

Used to perform operations related to the class as a whole.

Example:

```
class Person:
```

```
    species = "Homo sapiens"
```

```
    @classmethod
```

```
    def get_species(cls):
```

```
        return cls.species
```

Static Methods

Defined with `@staticmethod` decorator inside a class.

Do not take any `self` or class arguments.

Have no access to the instance or class data.

Used to define helper functions that are related to the class but do not operate on its data.

Example:

```
class Person:
```

```
    @staticmethod
```

```
    def is_valid_age(age):
```

```
        return age >= 0 and age < 120
```

Summary Table:

Method Type	First Argument	Access	Use
Instance Method	<code>self</code>	Instance data and methods	Operations on specific instances
Class Method	<code>cls</code>	Class data and methods	Operations related to the class
Static Method	None	No access	Helper functions related to the class