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Week 12 – Tutorial Class

SKILLS FOR LIFE
SKILLS BOOTCAMPS

Department for Education

Software Engineering Lecture Housekeeping

- The use of disrespectful language is prohibited in the questions, this is a supportive, learning environment for all - please engage accordingly. **(FBV: Mutual Respect.)**
- No question is daft or silly - **ask them!**
- There are **Q&A sessions** midway and at the end of the session, should you wish to ask any follow-up questions. Moderators are going to be answering questions as the session progresses as well.
- If you have any questions outside of this lecture, or that are not answered during this lecture, please do submit these for upcoming Open Classes. You can submit these questions here: **Open Class Questions**

Software Engineering Lecture Housekeeping cont.

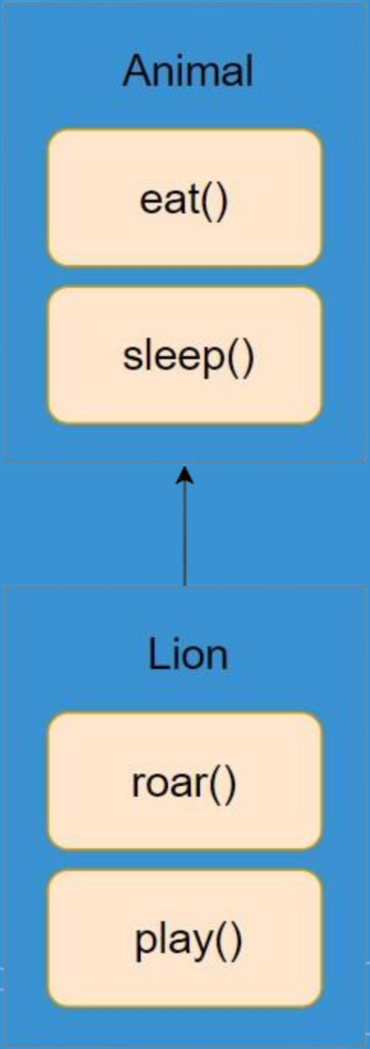
- For all **non-academic questions**, please submit a query: **www.hyperiondev.com/support**

- Report a **safeguarding** incident: **www.hyperiondev.com/safeguardreporting**

- We would love your **feedback** on lectures: **Feedback on Lectures**

Lecture Objectives

1. Review inheritance and its role in OOP.
2. Apply inheritance to your code.
3. Open Floor Q&A



Inheritance

What is Inheritance?

- Sometimes we require a class with the same attributes and properties as another class but we want to extend some of the behaviour or add more attributes.
- Using inheritance we can create a new class with all the properties and attributes of a base class instead of having to redefine them.

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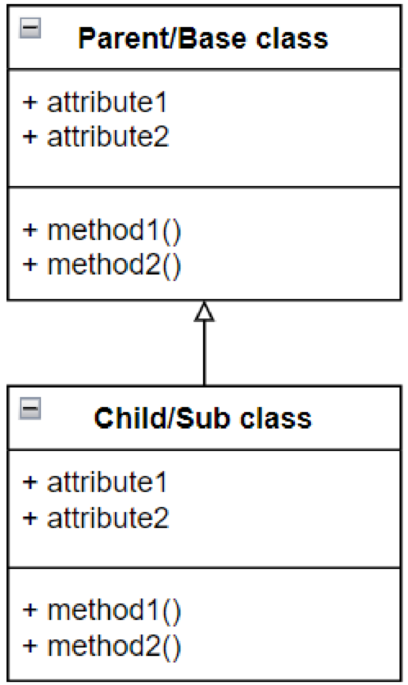
What is Inheritance?



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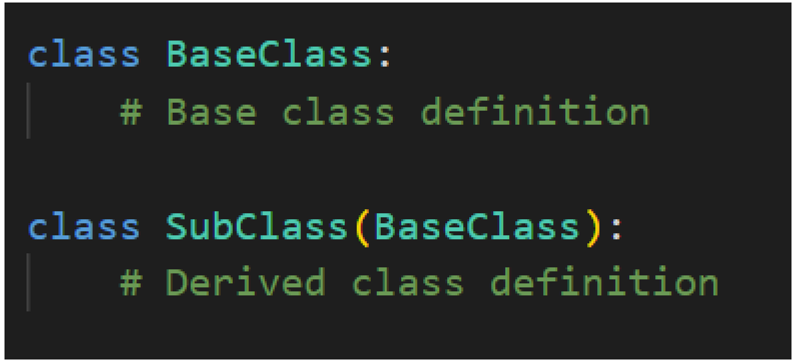
Inheritance

- Parent/Base class
  - The parent or base class contains all the attributes and properties we want to inherit.
- Child/Subclass
  - The sub class will inherit all of its attributes and properties from the parent class.

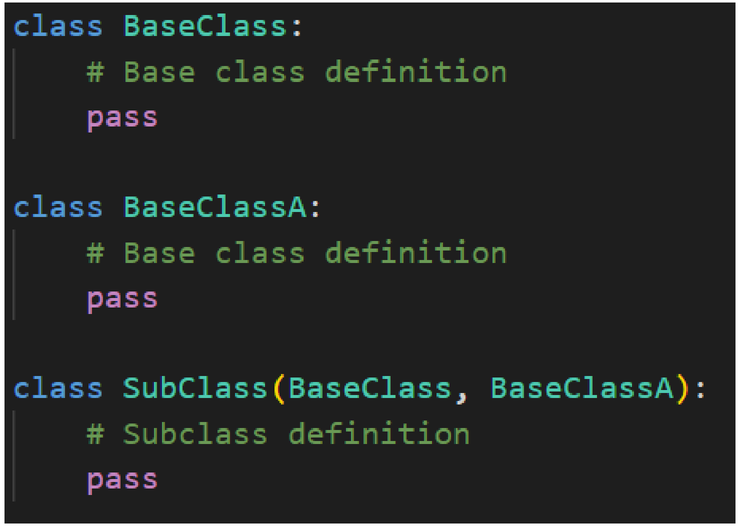


```python
class BaseClass:
    # Base class definition

class SubClass(BaseClass):
    # Derived class definition
```

Multiple Inheritance

- Python allows multiple inheritance as well.
- This means we can have a subclass that inherits attributes and properties from more than one base class.

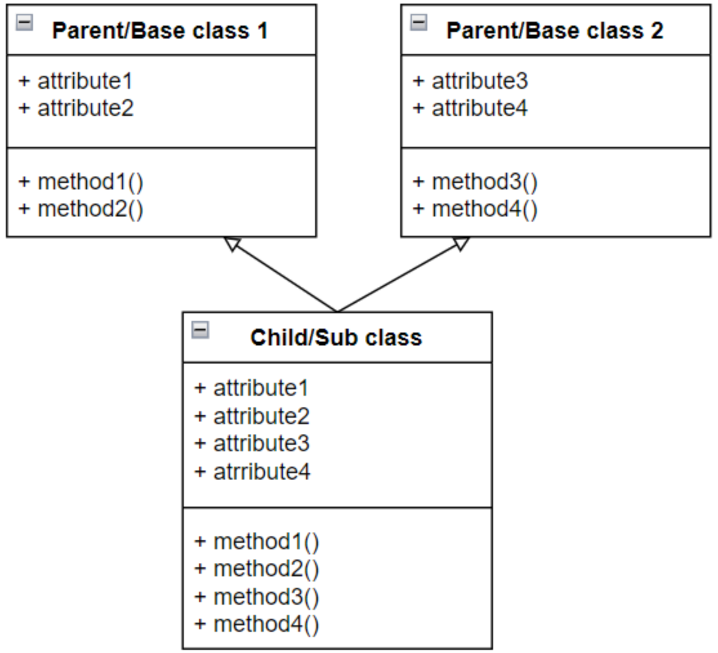


```python
class BaseClass:
    # Base class definition
    pass

class BaseClassA:
    # Base class definition
    pass

class SubClass(BaseClass, BaseClassA):
    # Subclass definition
    pass
```

Multiple Inheritance



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Method Overriding

- We can override methods in our subclass to either extend or change the behaviour of a method.
- To apply method overriding you simply need to define a method with the same name as the method you would like to override.
- To extend functionality of a method instead of completely overriding we can use the super() function.

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Super()

- The super() function allows us to access the attributes and properties of our Parent/Base class.

- Using super() followed by a dot "." we can call to the methods that reside inside our base class.

- When extending functionality of a method we would first want to call the base class method and then add the extended behaviour.

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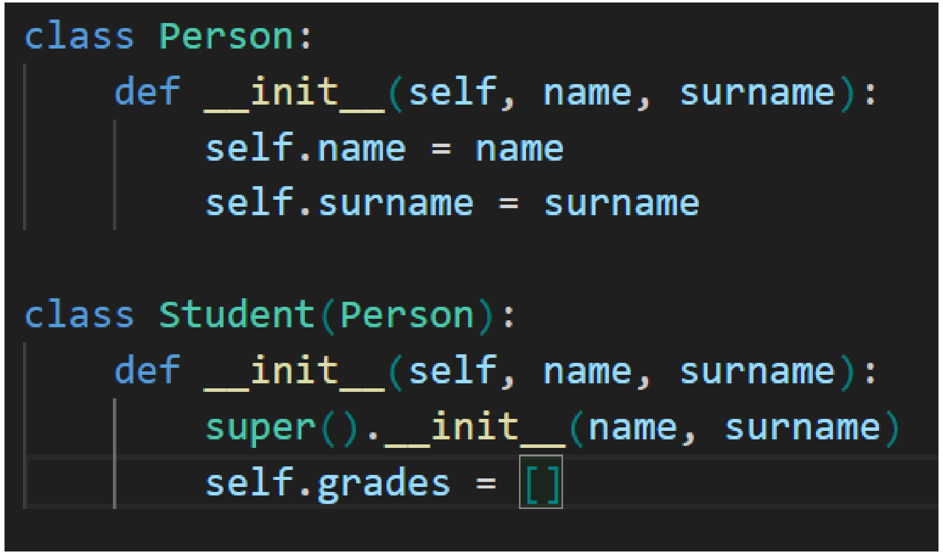
Methods overriding and Super()

Here we call __init__() from the Person class to set the values for the attributes “name” and “surname”.



```python
class Person:
    def __init__(self, name, surname):
        self.name = name
        self.surname = surname

class Student(Person):
    def __init__(self, name, surname):
        super().__init__(name, surname)
        self.grades = []
```

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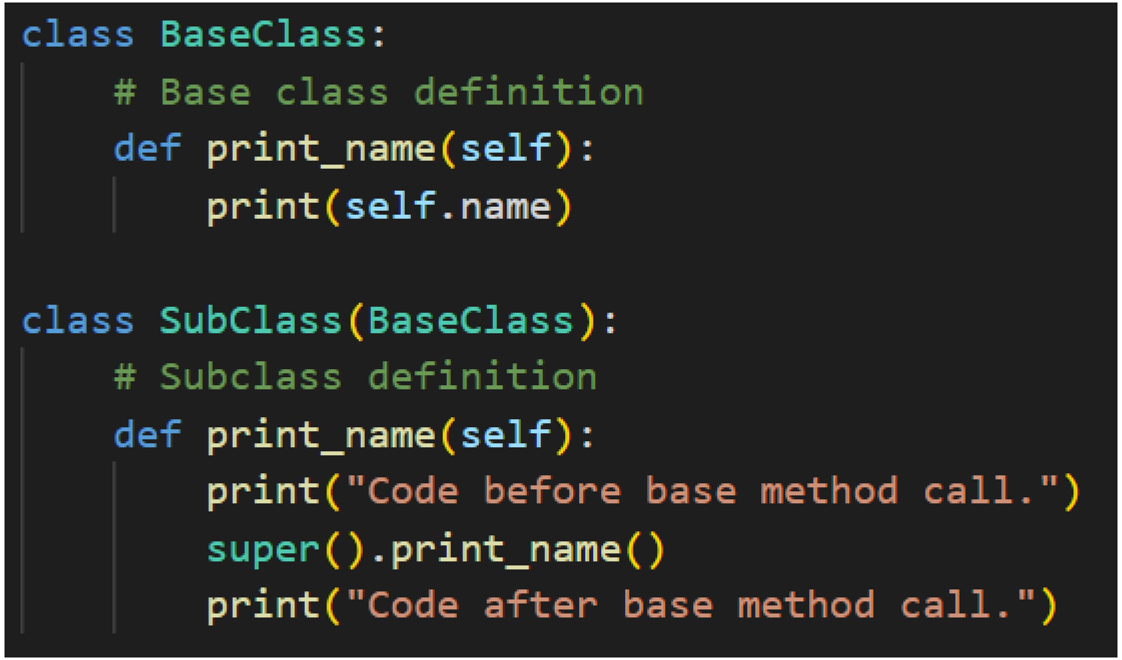
Methods overriding and Super()



```python
class BaseClass:
    # Base class definition
    def print_name(self):
        print(self.name)

class SubClass(BaseClass):
    # Subclass definition
    def print_name(self):
        print("Code before base method call.")
        super().print_name()
        print("Code after base method call.")
```

isinstance() and issubclass()

- We can determine if an object is an instance of a particular class using isinstance()
    - E.g. isinstance(object, ClassType)

- We can determine if a class is a subclass of another class using issubclass()
    - E.g. issubclass(SubClass, BaseClass)

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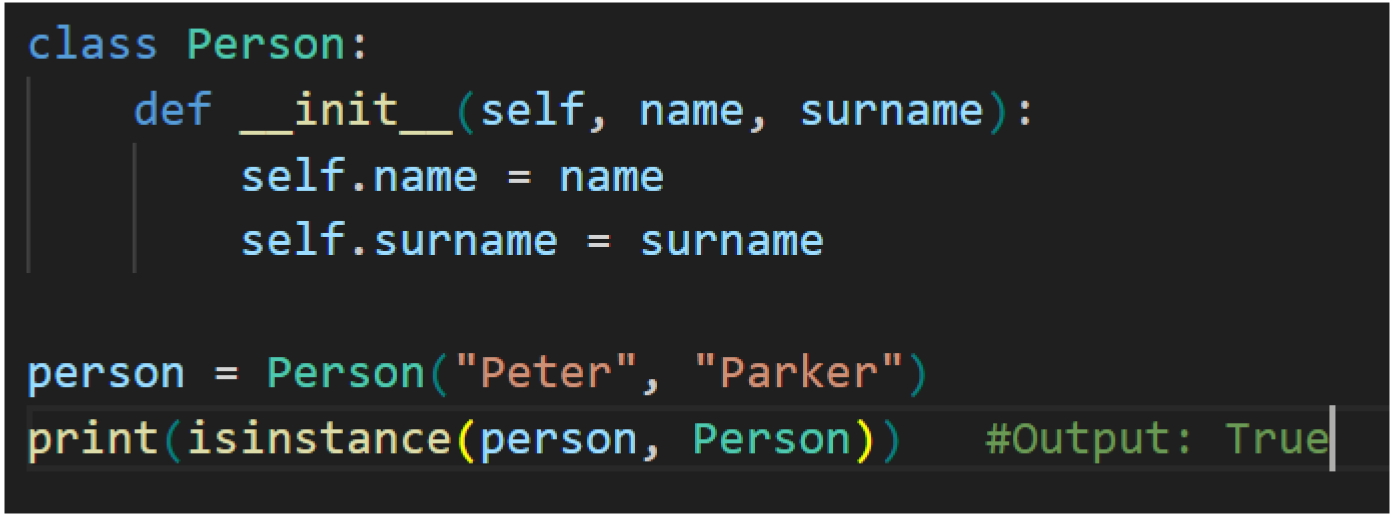
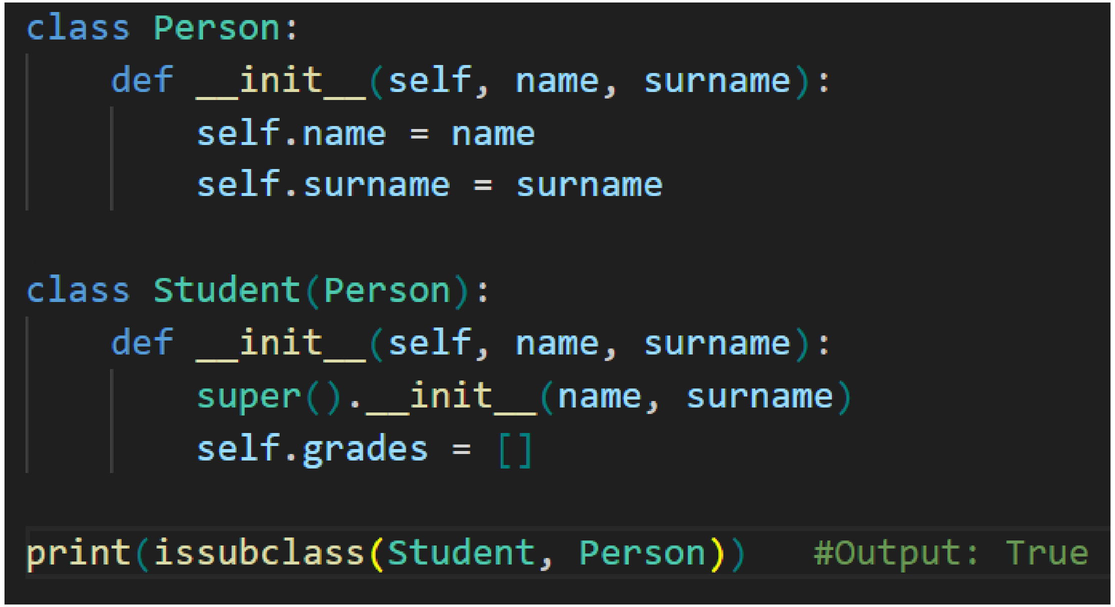
isinstance()



```python
class Person:
    def __init__(self, name, surname):
        self.name = name
        self.surname = surname

person = Person("Peter", "Parker")
print(isinstance(person, Person))    #Output: True
```

issubclass()



```python
class Person:
    def __init__(self, name, surname):
        self.name = name
        self.surname = surname

class Student(Person):
    def __init__(self, name, surname):
        super().__init__(name, surname)
        self.grades = []

print(issubclass(Student, Person))   #Output: True
```

*

Progression Criteria

✓ Criterion 1: Initial Requirements

- Complete 15 hours of Guided Learning Hours and the first four tasks within two weeks.

✓ Criterion 2: Mid-Course Progress

- Software Engineering: Finish 14 tasks by week 8.
- Data Science: Finish 13 tasks by week 8.

✓ Criterion 3: Post-Course Progress

- Complete all mandatory tasks by 24th March 2024.
- Record an Invitation to Interview within 4 weeks of course completion, or by 30th March 2024.
- Achieve 112 GLH by 24th March 2024.

✓ Criterion 4: Employability

- Record a Final Job Outcome within 12 weeks of graduation, or by 23rd September 2024.

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New Partnerships Unveiled!

- **University of Manchester & Imperial College London** join our circle along with The University of Nottingham Online.

Exclusive Opportunity:

- Co-certification spots awarded on a first-come basis.
- Meet the criteria early to gain eligibility for the co-certification.

Key Deadlines:

- **11 March 2024**: 112 Guided Learning Hours & 'Build Your Brand' tasks completion.
- **18 March 2024**: Record interview invitation or self-employment.
- **15 July 2024**: Submit verified job offer or new contract.

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Thank you for joining