Software Engineering Bootcamp

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Workshop: Object-Oriented Programming

Workshop - Housekeeping

- ❑ The use of disrespectful language is prohibited in the questions, this is a supportive, learning environment for all - please engage accordingly.
- ❑ 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.
- ❑ You can also submit questions here: http://hyperiondev.com/sbc4-se-questions
- ❑ For all non-academic questions, please submit a query: www.hyperiondev.com/support
- ❑ Report a safeguarding incident: http://hyperiondev.com/safeguardreporting
- ❑ We would love your feedback on lectures: https://hyperionde.wufoo.com/forms/zsgv4m40ui4i0q/

Github Repository - Workshop Examples

https://github.com/HyperionDevBootcamps/C4_SE_lecture_examples

Objectives

1. What is Object-oriented programming?
2. Understand the concept of object-oriented programming
    a. Classes and their properties
    b. Class instantiation - Objects
    c. Methods within classes

What is Object-Oriented Programming?

- A form of programming that models real-world interactions of physical objects.

- Relies on **classes** and **objects** over functions and logic.

- Powerful tool for abstraction.

OOP Components

- **Class**
  - Different to an object.
  - Think of an object as a house - the class is the blueprint.
- **Properties**
  - Data contained in classes.
  - For example, a student has a name, age, grade etc. These are properties of a student.
  - Comes in the form of variables that you can access (e.g. my_student.name).

Creating a Class

- __init__ function is called when class is instantiated.

```
class Student():
    # class variables
    college = "HyperionDev"
    def __init__(self, name, age, grades):
        # instance variables
        self.name = name
        self.age = age
        self.grades = grades
```

static, value will never change.

assigned at instantiation, can change.

Creating an object – Class Instantiation

- Objects are basically initialised versions of your blueprint
- They each have the properties you have defined in your constructor.

```
my_student = Student("Anne", 23, [80, 75, 91])
```

- Class takes in three values: a name, age and grades.

Creating Methods within a Class

- Within the class, you define a function.
- First parameter is always called **self** - this references the object itself.
- Let's say you want to average all grades that a student achieved with a single call:

```
def average_grade(self):
    return sum(self.grades) / len(self.grades)
```

```
class Student():

          def __init__(self, name, age, gender, grades):
                    self.age = age
                    self.name = name
                    self.gender = gender
                    Self.grades = grades

          def average_grades(self):
                    average = sum(self.grades)/len(self.grades)
                    print(f”The average for student {self.name} is {average}”)
def main():
          # initialise student object
          my_student = Student("Anne", 23, [80, 75, 91])
          # Call the method on the objects
          my_student.average_grades() # prints The average for student Anne is 82
main()
```

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Let’s have look at an example in VS code!

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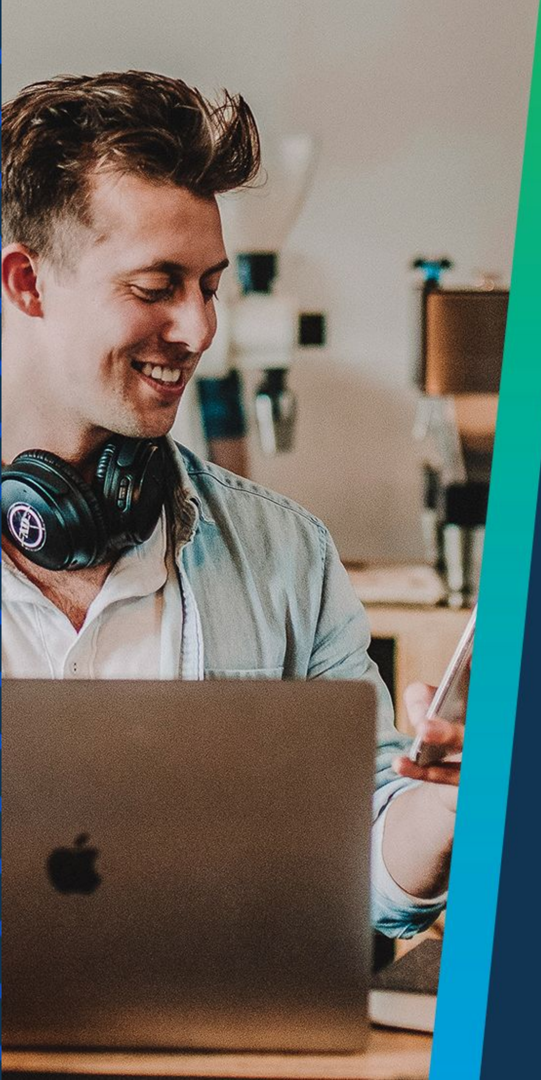
Q & A Section

Please use this time to ask any questions relating to the topic explained, should you have any



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Thank you for joining us

Stay hydrated
Avoid prolonged screen time
Take regular breaks
Have fun :)