
IMPLEMENTING
ENCAPSULATION AND
AGGREGATION
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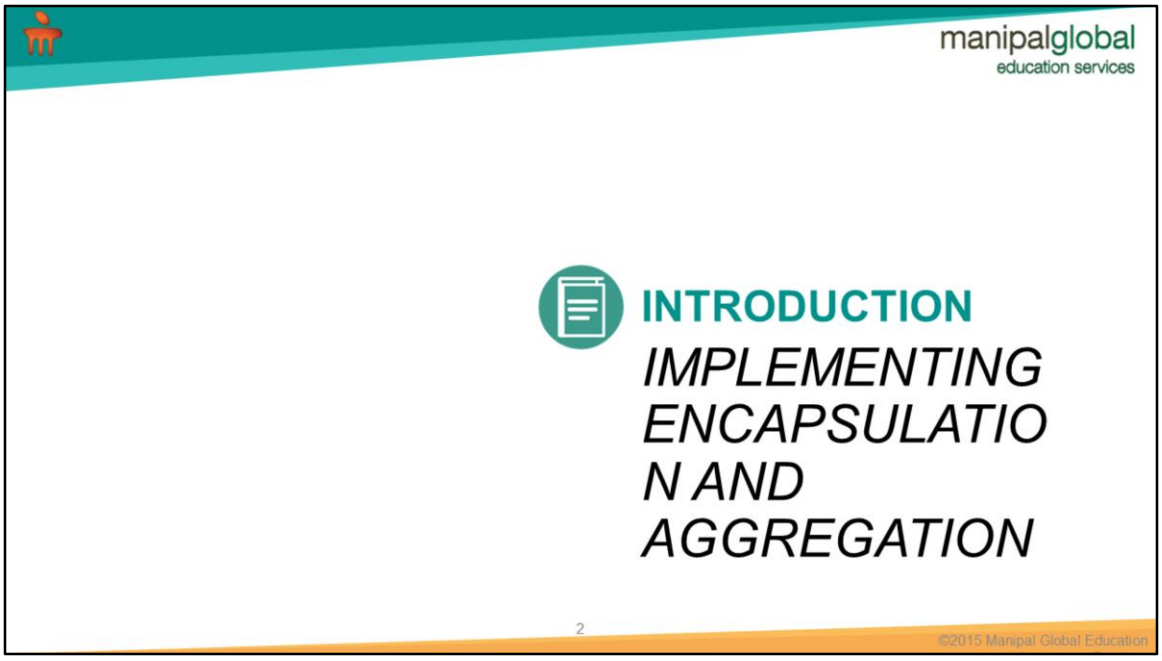
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INTRODUCTION
IMPLEMENTING ENCAPSULATION AND AGGREGATION
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LEARNING OBJECTIVES

At the end of this lesson, you will be able to:

- Understand Encapsulation
- Implement a class with Encapsulation concepts
- Understand and implement Aggregation.
- Differentiate between Aggregation and Composition


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CONCEPT
Implementing
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Refer package **com.mgait.encapsulation** in the provided code base for demo programs on Encapsulation

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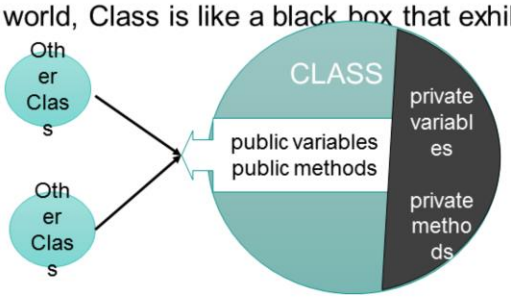
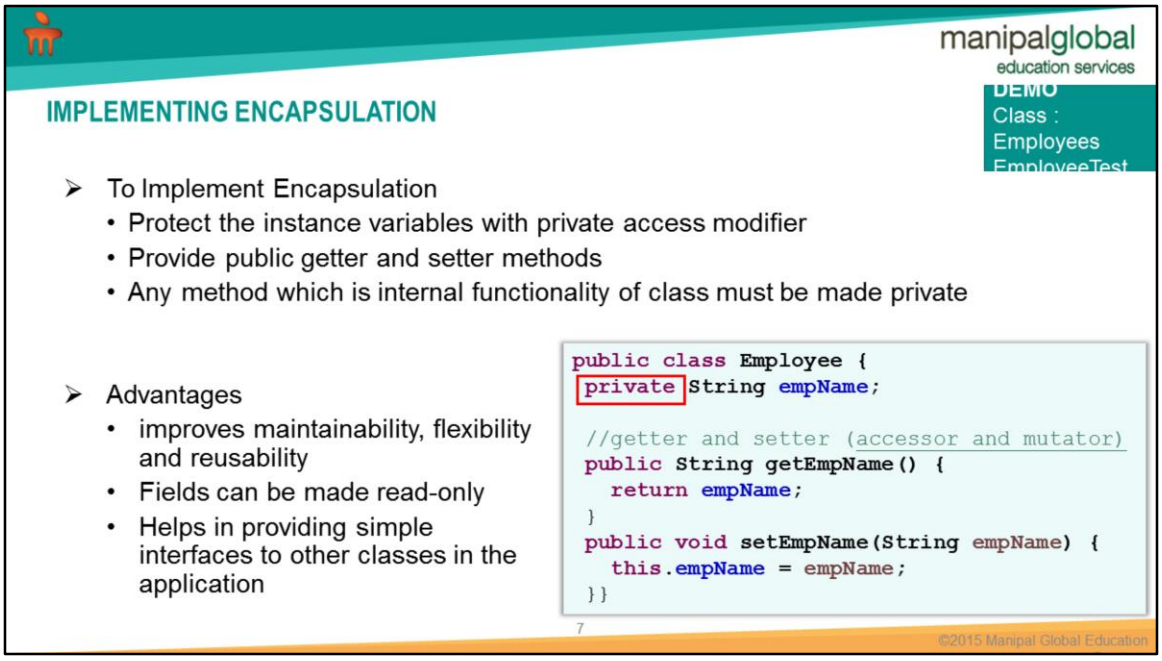
UNDERSTANDING ENCAPSULATION

- Is the concept of hiding most of the data and internal functionality and exposing essential interfaces for interacting with the object
- Class is like a capsule which encapsulates methods and data to provide intended functionality
- To external world, Class is like a black box that exhibits certain behavior

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IMPLEMENTING ENCAPSULATION
DEMO
Class :
Employees
EmployeeTest
To Implement Encapsulation
Protect the instance variables with private access modifier
Provide public getter and setter methods
Any method which is internal functionality of class must be made private
Advantages
improves maintainability, flexibility and reusability
Fields can be made read-only
Helps in providing simple interfaces to other classes in the application
public class Employee {
private String empName;
//getter and setter (accessor and mutator)
public String getEmpName() {
return empName;
}
public void setEmpName(String empName) {
this.empName = empName;
}}
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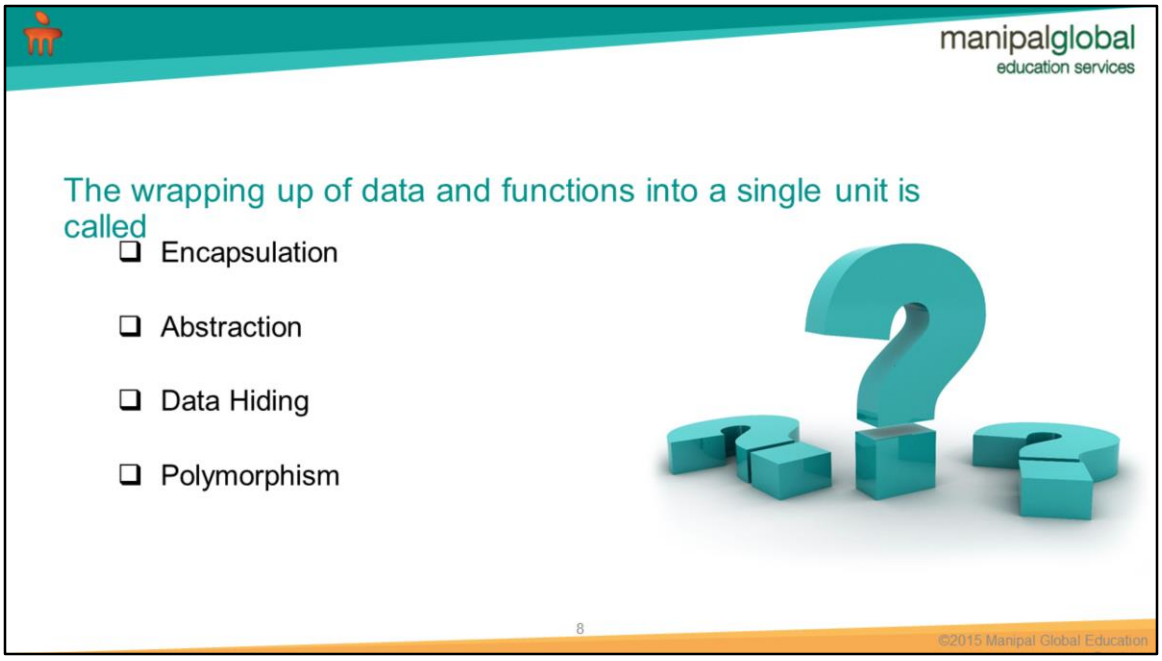
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The wrapping up of data and functions into a single unit is called
Encapsulation
Abstraction
Data Hiding
Polymorphism
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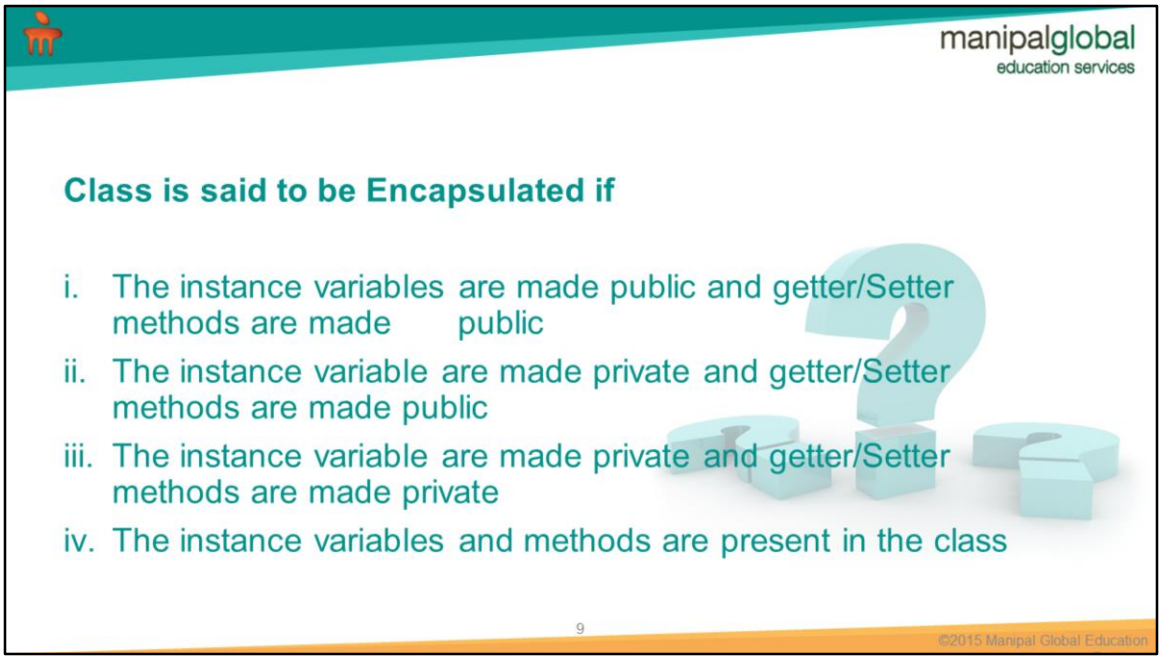
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Class is said to be Encapsulated if
i. The instance variables are made public and getter/Setter methods are made public
ii. The instance variable are made private and getter/Setter methods are made public
iii. The instance variable are made private and getter/Setter methods are made private
iv. The instance variables and methods are present in the class
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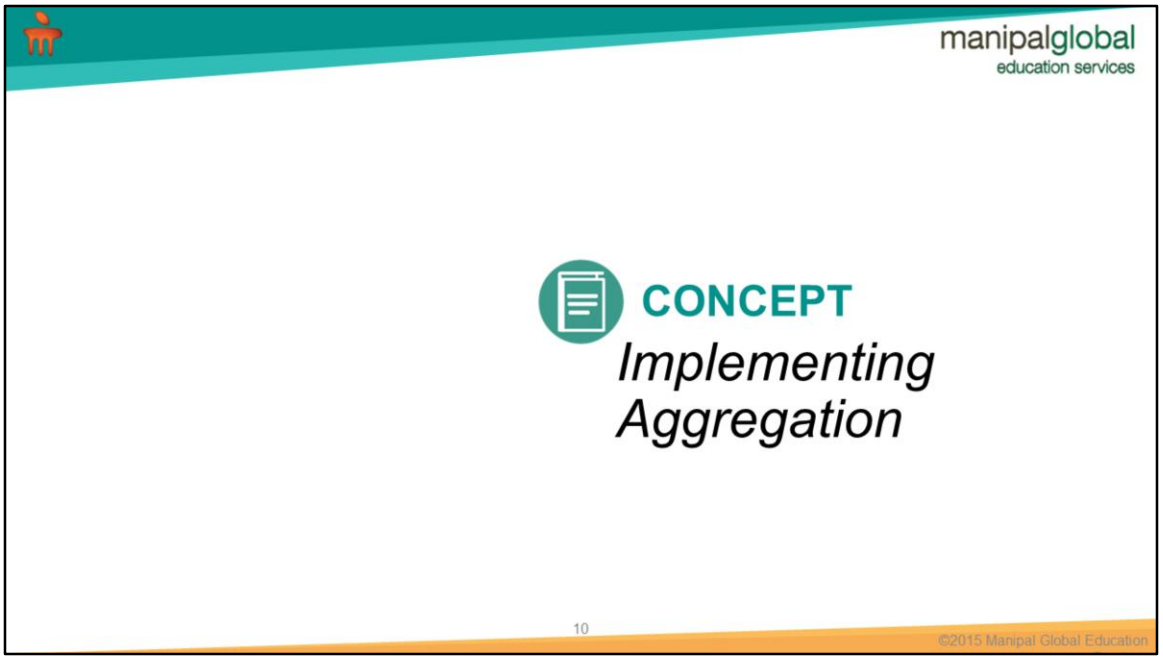
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CONCEPT
Implementing
Aggregation
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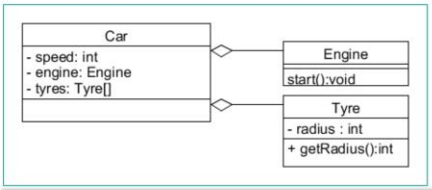
Refer package **com.mgait.aggregation** in the provided code base for demo programs on Aggregation

AGGREGATION AND COMPOSITION

- Aggregation is a relationship between classes, where object of one class contains objects of other classes
- The contained object can exist, even if the containing object ceases to exist
- HAS-A relationship between two classes
  - Ex: Account has Locker, Car has tyres
- Implemented by making the contained object reference as an instance variable in containing object




```
class Engine{
        public void start(){..};
}
class Tyre {
        int radius;
        public int getRadius(){..};
}
class Car{
        int speed;
        Engine engine;
        Tyre[] tyres = new Trye[4];
        … methods--     }
```

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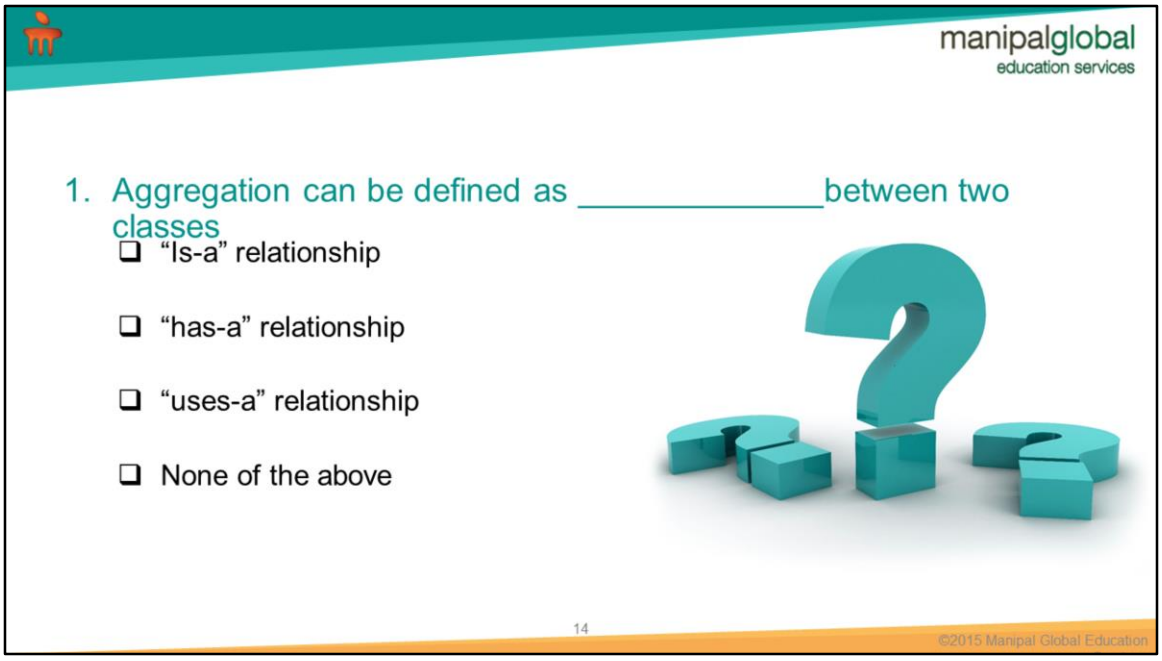
AGGREGATION AND COMPOSITION

DEMO
Class : Date, Account, AccountTest

- Composition is a stricter form of aggregation
  - contained object cannot exist, if the containing object ceases to exist
  - Ex. Account has Transactions

- Advantages
  - Helps design classes that follow good OO practices
  - Reuse of classes
  - Avoids code redundancy
  - Ease in Maintenance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1. Aggregation can be defined as _____between two classes
❑ "Is-a" relationship
❑ "has-a" relationship
❑ "uses-a" relationship
❑ None of the above
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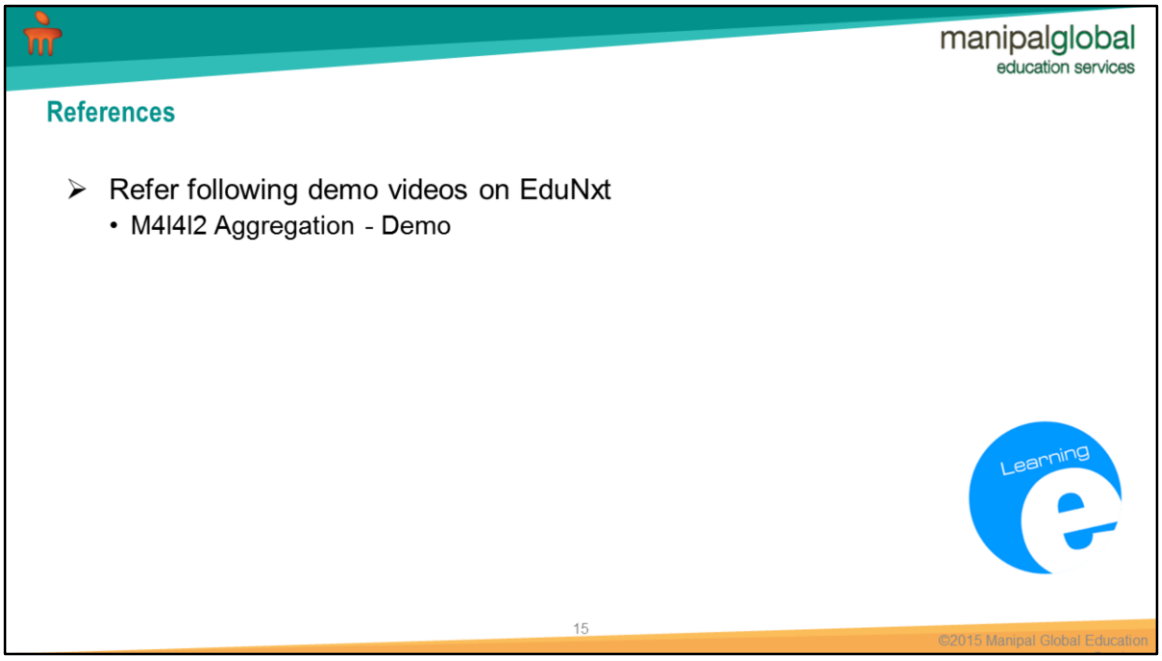
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References
Refer following demo videos on EduNxt
M4l4l2 Aggregation - Demo
Learning
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SUMMARY
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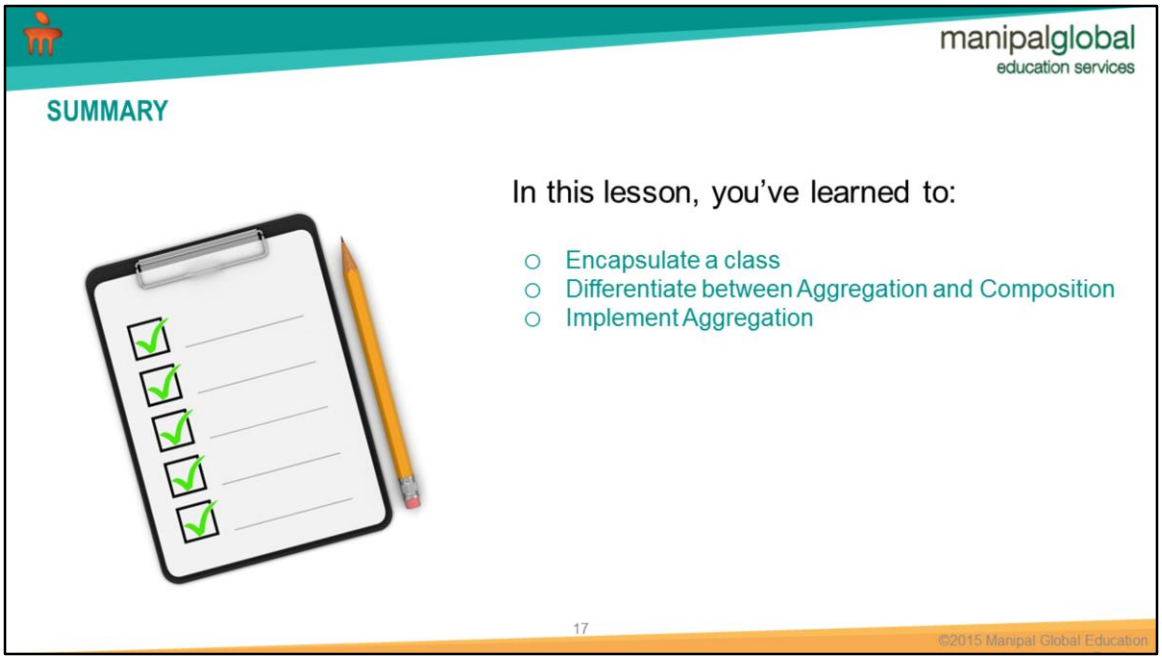
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SUMMARY
In this lesson, you've learned to:
Encapsulate a class
Differentiate between Aggregation and Composition
Implement Aggregation
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